



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

In cooperation with  
United States Department  
of the Interior, Bureau of  
Land Management and  
Bureau of Indian Affairs;  
United States Department  
of Agriculture, Forest  
Service; and University of  
Nevada, Agricultural  
Experiment Station

# **Soil Survey of Mineral County Area, Nevada (Volume I)**

# How To Use This Soil Survey

## General Soil Map

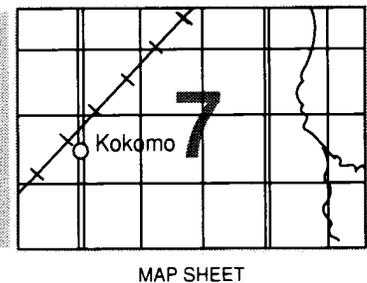
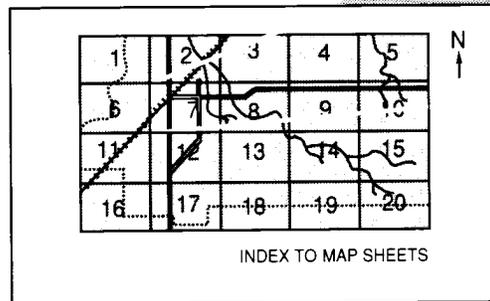
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

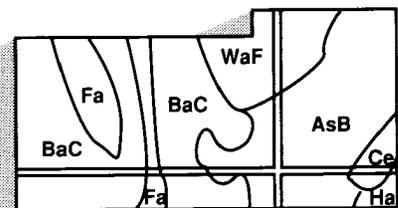
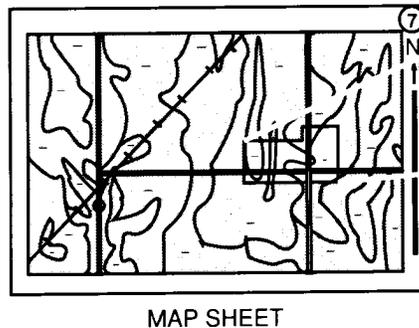
## Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

---

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This survey was made cooperatively by the Soil Conservation Service; United States Department of the Interior, Bureau of Land Management and Bureau of Indian Affairs; United States Department of Agriculture, Forest Service; and the University of Nevada, Agricultural Experiment Station. It is part of the technical assistance furnished to the Mason Valley Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

# Contents

---

<b>Index to map units</b> .....	vi	Bijorja series .....	590
<b>Summary of tables</b> .....	xi	Blacktop series .....	591
<b>Foreword</b> .....	xiii	Bluewing series .....	591
General nature of the survey area .....	1	Bombadil Family .....	592
How this survey was made .....	8	Borealis series .....	592
<b>General soil map units</b> .....	11	Borealis Family .....	593
Map unit descriptions .....	11	Bouncer series .....	594
Broad land use considerations .....	18	Brawley series .....	595
<b>Detailed soil map units</b> .....	19	Bregar Family .....	595
Map unit descriptions .....	21	Breko series .....	596
<b>Prime farmland</b> .....	559	Brier series .....	597
<b>Use and management of the soils</b> .....	561	Buckaroo series .....	598
Crops and pasture .....	561	Budihol series .....	599
Rangeland .....	563	Bulake Family .....	600
Woodland management .....	567	Bylo Variant .....	600
Woodland understory vegetation .....	568	Calpeak series .....	601
Windbreaks and environmental plantings .....	568	Candelaria series .....	601
Wildlife habitat .....	568	Celeton series .....	603
Recreation .....	569	Chill series .....	603
Engineering .....	570	Chuckridge series .....	604
<b>Soil properties</b> .....	573	Cirac series .....	605
Engineering index properties .....	573	Clanalpine Family .....	606
Physical and chemical properties .....	573	Cleaver series .....	607
Soil and water features .....	575	Coutis Family .....	608
<b>Classification of the soils</b> .....	577	Crunker series .....	608
Soil series and their morphology .....	577	Crunkvar series .....	609
Acana Family .....	577	Cucamungo Variant .....	610
Advokay series .....	578	Dakent series .....	611
Annaw series .....	579	Dedmount series .....	612
Antholop series .....	580	Deefan series .....	613
Argalt series .....	581	Downeyville series .....	614
Armespan series .....	582	Eaglepass series .....	615
Armoine series .....	583	Eastgate series .....	616
Baldy Variant .....	584	Epvip series .....	617
Bango series .....	584	Fadoll series .....	618
Barnmot series .....	586	Fallon series .....	618
Beano series .....	586	Fawin series .....	619
Beelem series .....	587	Fettic Variant .....	620
Bellehelen series .....	588	Fulstone series .....	621
Belted series .....	589	Fusuvar series .....	622

Gabbvally series .....	623	Nemico series .....	653
Garhill series .....	624	Nire series .....	654
Geer series .....	625	Nuahs series .....	655
Goldyke series .....	625	Nupart series .....	656
Granmount series .....	626	Nuyobe series .....	657
Gynelle series .....	627	Old Camp series .....	657
Haar series .....	628	Oricto series .....	658
Haarvar series .....	629	Patna series .....	659
Handpah series .....	629	Pedee Variant .....	660
Hapgood Family .....	630	Penelas series .....	661
Hawsley series .....	631	Perazzo series .....	662
Hiridge series .....	631	Petspring series .....	663
Holtle Variant .....	632	Pintwater series .....	663
Inmo series .....	633	Powment series .....	664
Isolde series .....	634	Pumel series .....	665
Itca series .....	634	Rattleflat series .....	665
Itme series .....	635	Ratto Family .....	666
Izo series .....	636	Ravenell series .....	667
Jeness Family .....	637	Ravenswood series .....	668
Jetcop series .....	637	Rawe series .....	668
Karpp Family .....	638	Rednik series .....	670
Katyblay series .....	639	Reese Family .....	671
Kawich Family .....	640	Rockabin series .....	671
Kiote series .....	640	Rodad series .....	672
Koyen series .....	641	Roic series .....	673
Kyler series .....	642	Rowel series .....	674
Langston Family .....	642	Sagouspe series .....	674
Lathrop series .....	643	Sheeprock Family .....	675
Lazan series .....	644	Silverbow series .....	676
Lazan Family .....	645	Singatse series .....	677
Lithic Xerorthents .....	645	Slaw series .....	677
Logring series .....	646	Smedley series .....	678
Lomoin series .....	646	Snopoc series .....	679
Loomer series .....	647	Sodaspring series .....	680
Luning series .....	648	Sonoma series .....	681
Madeline Family .....	649	Squawtip series .....	682
Merino Family .....	650	Stewval series .....	683
Mickey series .....	650	Stumble series .....	683
Mirkwood series .....	651	Sundown series .....	684
Mopana series .....	652	Teguro series .....	685

---

Tejabe series .....	686	Vinini Family .....	699
Terlco series .....	686	Wabuska series .....	700
Tert series .....	688	Wardenot series .....	701
Theon series .....	688	Wassit series .....	702
Theriot series .....	689	Watoopah Family .....	703
Toney Family .....	689	Wedlar series .....	703
Tornillo Variant .....	690	Wellsed series .....	705
Trocken series .....	691	Whilphang series .....	706
Troutville Variant .....	692	Wiskiflat series .....	706
Truhoy series .....	693	Wrango series .....	707
Truvar series .....	694	Zadvar series .....	707
Typic Cryorthents .....	695	Zyzzi series .....	708
Typic Torriorthents .....	695	<b>Formation of the soils</b> .....	711
Unsel series .....	696	<b>References</b> .....	717
Uripnes series .....	697	<b>Glossary</b> .....	719
Veet series .....	697	<b>Appendix</b> .....	731
Venable Family .....	698	<b>Tables</b> .....	741
Veta series .....	699	<b>Rangeland plants and woodland understory</b> .....	865

Issued October 1991

# Index to Map Units

202—Tornillo Variant fine sandy loam, 0 to 4 percent slopes . . . . .	21	1130—Uripnes-Rock outcrop association . . . . .	63
203—Toney Family, 2 to 8 percent slopes . . . . .	22	1131—Uripnes-Budihol-Rock outcrop association . . .	64
205—Pedee Variant sand, 2 to 15 percent slopes . . . . .	23	1136—Uripnes-Pumel-Rock outcrop association . . . .	65
206—Bombadil-Acana Families association . . . . .	24	1138—Uripnes-Petspring-Rock outcrop association . . . . .	67
207—Bulake Family, 8 to 30 percent slopes . . . . .	25	1139—Uripnes-Zyzzu-Rock outcrop association . . . . .	69
208—Bregar Family, 2 to 15 percent slopes . . . . .	25	1140—Wabuska-Isolde association . . . . .	70
211—Langston-Karpp Families association . . . . .	26	1141—Wabuska-Playas-Isolde association . . . . .	72
213—Ratto-Vinini Families association . . . . .	27	1142—Wabuska-Playas association . . . . .	73
214—Watoopah Family, 2 to 8 percent slopes . . . . .	29	1151—Gynelle very gravely loamy sand, sodic, 0 to 4 percent slopes . . . . .	74
216—Merino Family, 30 to 50 percent slopes . . . . .	29	1153—Gynelle gravely loamy sand, 2 to 4 percent slopes . . . . .	75
218—Ratto-Borealis Families association . . . . .	30	1155—Gynelle-Izo association . . . . .	76
301—Lazan Family-Powment association . . . . .	31	1156—Gynelle-Izo association, strongly sloping . . . . .	78
302—Jenness Family, 0 to 4 percent slopes . . . . .	32	1171—Hawsley-Theon association . . . . .	79
304—Reese Family-Tornillo Variant-Kawich Family association . . . . .	33	1172—Hawsley sand, 0 to 4 percent slopes . . . . .	81
305—Sheeprock Family, 4 to 30 percent slopes . . . . .	34	1173—Hawsley-Izo association . . . . .	82
306—Baldy Variant silt loam, 0 to 4 percent slopes . . . . .	35	1174—Hawsley-Typic Torriorthents association . . . . .	84
307—Jenness Family-Fadoll association . . . . .	36	1180—Buckaroo-Bluewing association . . . . .	85
502—Haggood Family, 4 to 15 percent slopes . . . . .	37	1190—Old Camp-Theon-Rock outcrop association . . . . .	87
504—Coutis Family, 15 to 50 percent slopes . . . . .	37	1200—Playas . . . . .	89
505—Madeline-Bulake Families association . . . . .	38	1201—Playas-Slaw association . . . . .	89
507—Clan Alpine Family, 15 to 50 percent slopes . . . . .	39	1202—Dumps-Pits association . . . . .	90
902—Lava flows-Lithic Xerorthents complex, 2 to 8 percent slopes . . . . .	40	1205—Badland . . . . .	91
1032—Goldyke-Trocken association . . . . .	40	1210—Trocken-Bluewing association . . . . .	91
1033—Goldyke-Blacktop-Koyen association . . . . .	42	1221—Eastgate gravely sandy loam, 0 to 4 percent slopes . . . . .	93
1040—Isolde-Hawsley association . . . . .	44	1223—Eastgate-Cirac association . . . . .	94
1041—Isolde-Playas-Wabuska association . . . . .	46	1240—Blacktop-Downeyville-Rock outcrop association . . . . .	95
1042—Isolde-Dune land association . . . . .	48	1241—Blacktop-Rock outcrop association . . . . .	97
1043—Isolde-Cirac-Playas association . . . . .	49	1243—Blacktop-Rodad-Theriot association . . . . .	98
1044—Isolde-Patna-Hawsley association . . . . .	50	1280—Chill-Petspring association . . . . .	100
1072—Rednik-Trocken-Bluewing association . . . . .	52	1281—Chill-Beelem-Rock outcrop association . . . . .	102
1090—Singatse-Theon-Rock outcrop association . . . . .	55	1282—Chill-Veet association . . . . .	103
1091—Singatse-Gynelle-Izo association . . . . .	56	1283—Chill-Itme association . . . . .	105
1094—Singatse-Hawsley association . . . . .	59	1290—Petspring-Rock outcrop-Budihol association . . . . .	106
1121—Theon-Old Camp association . . . . .	60		
1127—Theon very gravely sandy loam, 8 to 30 percent slopes . . . . .	62		

1291—Petspring-Uripnes-Beelem association . . . . .	108	1490—Rattleflat-Crunker association . . . . .	167
1301—Sundown loamy sand, 2 to 8 percent slopes . . . . .	110	1492—Rattleflat-Wiskiflat association . . . . .	169
1310—Typic Torriorthents-Gynelle-Oricto association . . . . .	111	1500—Chuckridge-Crunker association . . . . .	171
1320—Belted-Downeyville association . . . . .	114	1510—Advokay-Budihol-Pumel association . . . . .	173
1322—Belted-Annaw association . . . . .	115	1511—Advokay sandy loam, moist, 2 to 8 percent slopes . . . . .	175
1323—Belted-Izo association . . . . .	117	1530—Dakent-Crunker association . . . . .	176
1324—Belted-Annaw association, stony . . . . .	119	1540—Beano-Annaw association . . . . .	178
1325—Belted-Terlco-Izo association . . . . .	120	1551—Typic Torriorthents-Unsel association . . . . .	179
1326—Belted-Breko association . . . . .	123	1570—Budihol-Uripnes-Petspring association . . . . .	181
1327—Belted-Lathrop association . . . . .	124	1580—Rockabin-Hiridge association . . . . .	183
1328—Belted-Zadvar association . . . . .	126	1590—Snopoc-Rockabin-Fusuvar association . . . . .	185
1329—Belted-Koyen association . . . . .	128	1591—Snopoc-Rockabin-Hiridge association . . . . .	187
1340—Barnmot-Belted association . . . . .	130	1600—Nupart-Lazan-Rock outcrop association . . . . .	189
1341—Barnmot-Haarvar association . . . . .	132	1601—Nupart-Rock outcrop association . . . . .	191
1342—Barnmot-Badland association . . . . .	134	1632—Annaw-Wardenot-Pintwater association . . . . .	192
1350—Calpeak-Gabbvally-Tejabe association . . . . .	135	1641—Unsel-Annaw association . . . . .	194
1351—Calpeak-Goldyke association . . . . .	137	1643—Unsel-Annaw-Izo association . . . . .	196
1353—Calpeak-Goldyke-Gabbvally association . . . . .	139	1670—Bouncer gravelly loamy fine sand, 15 to 50 percent slopes . . . . .	198
1354—Calpeak-Lomoine association . . . . .	141	1680—Lazan-Lazan, very steep-Nupart association . . . . .	199
1361—Gabbvally-Tejabe-Mirkwood association . . . . .	143	1691—Crunkvar-Lazan association . . . . .	202
1362—Gabbvally-Gabbvally, very steep-Stewval association . . . . .	145	1700—Granmount-Kiote-Hiridge association . . . . .	203
1363—Gabbvally very stony loam, moist, 15 to 50 percent slopes . . . . .	148	1710—Troutville Variant very bouldery sandy loam, 30 to 75 percent slopes . . . . .	205
1365—Gabbvally-Rock outcrop association . . . . .	149	1730—Bijorja-Petspring association . . . . .	207
1366—Gabbvally-Beelem-Rock outcrop association . . . . .	150	1750—Wedlar-Tert association . . . . .	208
1420—Dedmount-Slaw association . . . . .	152	1753—Wedlar sand, 2 to 8 percent slopes . . . . .	210
1440—Slaw-Isolde-Cirac association . . . . .	153	1780—Borealis-Rock outcrop association . . . . .	211
1441—Slaw silt loam, 0 to 2 percent slopes . . . . .	155	1781—Borealis-Antholop-Rock outcrop association . . . . .	212
1442—Slaw-Playas association . . . . .	156	1782—Borealis-Mopana association . . . . .	214
1445—Slaw, reclaimed-Slaw-Fallon complex, 0 to 2 percent slopes . . . . .	158	1783—Borealis-Itca association . . . . .	216
1450—Nuyobe-Playas association . . . . .	160	1790—Antholop-Wedlar association . . . . .	217
1451—Nuyobe-Slaw association . . . . .	161	1820—Lomoine-Petspring-Uripnes association . . . . .	219
1480—Fawin-Crunker association . . . . .	163	1821—Lomoine-Kyler-Budihol association . . . . .	221
1482—Fawin-Izo association . . . . .	164	1822—Lomoine-Kyler-Petspring association . . . . .	224
1483—Fawin fine sandy loam, 0 to 2 percent slopes . . . . .	166	1825—Lomoine-Beelem-Rock outcrop association . . . . .	226

1840—Kyler-Gabbvally association . . . . .	228	2023—Armespan-Wrango association . . . . .	285
1842—Kyler-Rock outcrop association . . . . .	229	2030—Theriot-Theriot, very steep-Rock outcrop association . . . . .	287
1843—Kyler-Logring-Rock outcrop association . . . . .	230	2031—Theriot-Eaglepass-Rock outcrop association . . . . .	288
1844—Kyler very gravelly fine sandy loam, 15 to 50 percent slopes . . . . .	232	2032—Theriot-Kyler-Rock outcrop association . . . . .	290
1860—Venable Family, 0 to 8 percent slopes . . . . .	233	2080—Roic-Roic, dry, association . . . . .	292
1870—Luning-Sundown association . . . . .	234	2081—Roic-Roic, dry-Badland association . . . . .	294
1871—Luning sandy loam, 0 to 4 percent slopes . . . . .	236	2082—Roic-Koyen association . . . . .	295
1875—Luning-Hawsley-Bluewing association . . . . .	237	2091—Geer-Veet association . . . . .	297
1877—Luning-Izo association . . . . .	239	2092—Geer fine sandy loam, 0 to 4 percent slopes . . . . .	298
1878—Luning-Oricto association . . . . .	240	2100—Rodad-Theriot-Kyler association . . . . .	299
1879—Luning-Eastgate association . . . . .	242	2101—Rodad-Penelas-Blacktop association . . . . .	302
1890—Wardenot, moderately steep-Wardenot-Izo association . . . . .	244	2110—Bylo Variant very fine sandy loam, 0 to 2 percent slopes . . . . .	304
1891—Wardenot-Izo association . . . . .	246	2120—Itme-Truhoy association . . . . .	304
1892—Wardenot, moist-Izo association . . . . .	248	3000—Perazzo-Typic Torriorthents association . . . . .	306
1893—Wardenot-Annaw-Izo association . . . . .	249	3001—Perazzo-Rawe-Bluewing association . . . . .	308
1894—Wardenot-Truhoy-Izo association . . . . .	251	3002—Perazzo-Veet-Rawe association . . . . .	310
1897—Wardenot-Stumble-Izo association . . . . .	253	3003—Perazzo-Bluewing association . . . . .	313
1910—Izo, rarely flooded-Izo association . . . . .	256	3020—Rawe-Bluewing-Trocken association . . . . .	314
1930—Cirac fine sandy loam, 0 to 2 percent slopes . . . . .	257	3040—Deefan-Rawe-Bluewing association . . . . .	316
1931—Cirac fine sandy loam, ponded, 0 to 2 percent slopes . . . . .	258	3042—Deefan-Perazzo association . . . . .	319
1940—Typic Torriorthents, 15 to 75 percent slopes . . . . .	259	3043—Deefan-Cleaver-Bluewing association . . . . .	320
1950—Lathrop-Terlco-Izo association . . . . .	260	3052—Veet-Itme association . . . . .	323
1951—Lathrop-Beltd-Veet association . . . . .	263	3054—Veet gravelly sandy loam, 4 to 8 percent slopes . . . . .	324
1970—Pintwater-Blacktop-Rock outcrop association . . . . .	265	3060—Smedley-Silverbow-Annaw association . . . . .	325
1972—Pintwater-Terlco association . . . . .	267	3061—Smedley-Annaw-Izo association . . . . .	327
1980—Tert-Whilphang-Armespan association . . . . .	269	3063—Smedley very gravelly sandy loam, 4 to 30 percent slopes . . . . .	330
1981—Tert-Whilphang-Geer association . . . . .	271	3070—Silverbow-Rubble land-Smedley association . . . . .	331
1982—Tert-Badland association . . . . .	273	3090—Inmo-Inmo, occasionally flooded, association . . . . .	332
1983—Tert-Roic association . . . . .	274	3091—Inmo-Rednik association . . . . .	334
1990—Whilphang-Armespan association . . . . .	275	3092—Inmo-Nuahs-Luning association . . . . .	336
2002—Sodaspring-Izo association . . . . .	277	3095—Inmo-Stumble association . . . . .	338
2011—Nuahs loamy sand, 0 to 4 percent slopes . . . . .	279	3110—Fulstone-Wedlar-Veet association . . . . .	340
2020—Armespan-Whilphang-Wrango association . . . . .	280		
2022—Armespan-Whilphang-Geer association . . . . .	282		

3111—Fulstone-Mickey association . . . . .	342	4073—Zadvar-Veet association . . . . .	399
3120—Wassit-Brawley association . . . . .	344	4080—Truvar-Crunker association . . . . .	401
3123—Wassit very stony sandy loam, 15 to 50 percent slopes . . . . .	346	4081—Truvar-Fadoll association . . . . .	402
3124—Wassit-Loomer association . . . . .	347	4090—Eaglepass-Rock outcrop complex, 30 to 75 percent slopes . . . . .	404
3130—Mickey-Smedley-Veet association . . . . .	349	4100—Stumble loamy sand, 2 to 4 percent slopes . . . . .	405
3131—Mickey-Veet association . . . . .	351	4102—Stumble loamy fine sand, 4 to 15 percent slopes . . . . .	406
3133—Mickey very gravelly sandy loam, 4 to 30 percent slopes . . . . .	353	4103—Stumble-Stumble, sodic, loamy fine sands, 0 to 8 percent slopes . . . . .	407
3140—Loomer-Rowel-Downeyville association . . . . .	354	4110—Fadoll loamy sand, 0 to 4 percent slopes . . . . .	409
3141—Loomer-Rowel-Wassit association . . . . .	356	4121—Brawley very stony fine sandy loam, 15 to 50 percent slopes . . . . .	410
3142—Loomer-Downeyville-Rock outcrop association . . . . .	359	4130—Penelas-Rodad-Gabbvally association . . . . .	411
3143—Loomer-Rowel-Rubble land association . . . . .	361	4150—Stewval-Lomoiné association . . . . .	414
3150—Zyzzí very gravelly sandy loam, 8 to 30 percent slopes . . . . .	362	4152—Stewval-Pintwater-Rock outcrop association . . . . .	415
3151—Zyzzí-Nupart association . . . . .	364	4153—Stewval very gravelly sandy loam, 8 to 50 percent slopes . . . . .	417
3170—Ravenell-Haar-Rock outcrop association . . . . .	365	4154—Stewval, very steep-Stewval-Gabbvally association . . . . .	418
3191—Wellsed-Mickey-Veet association . . . . .	367	4155—Stewval-Kyler association . . . . .	421
3192—Wellsed-Ravenell-Haar association . . . . .	370	4156—Stewval-Beelem association . . . . .	422
3193—Wellsed-Wedlar association . . . . .	372	4157—Stewval-Bellehelen-Rock outcrop association . . . . .	424
3194—Wellsed-Smedley-Mickey association . . . . .	374	4159—Stewval-Gabbvally-Tejabe association . . . . .	426
3210—Fallon-Fettic Variant-Fallon, saline-sodic, association . . . . .	377	4161—Terlco-Izo association . . . . .	428
3212—Fallon-Slaw complex . . . . .	379	4162—Terlco-Annaw-Izo association . . . . .	430
3220—Rowel very cobbly sandy loam, 8 to 30 percent slopes . . . . .	381	4163—Terlco-Izo association, moderately steep . . . . .	432
3221—Rowel-Rock outcrop association . . . . .	382	4165—Terlco-Wardenot-Roic association . . . . .	434
3300—Typic Torriorthents, 4 to 15 percent slopes . . . . .	383	4166—Terlco, dry-Wardenot-Roic association . . . . .	436
3310—Veta-Smedley association . . . . .	384	4170—Downeyville-Blacktop association . . . . .	438
4000—Garhill-Blacktop association . . . . .	386	4171—Downeyville-Hawsley association . . . . .	440
4021—Argalt-Gabbvally association . . . . .	388	4173—Downeyville-Stewval-Rock outcrop association . . . . .	442
4030—Koyen-Geer association . . . . .	390	4174—Downeyville-Stewval-Mirkwood association . . . . .	443
4050—Haarvar-Wrango association . . . . .	391	4175—Downeyville, moist-Downeyville-Blacktop association . . . . .	446
4061—Truhoy-Wardenot association . . . . .	393		
4062—Truhoy gravelly loamy sand, 2 to 8 percent slopes . . . . .	394		
4070—Zadvar-Stewval association . . . . .	396		
4071—Zadvar-Wrango association . . . . .	397		

4176—Downeyville, moist-Downeyville-Gabbvally association . . . . .	448	5080—Epvip-Hiridge-Katyblay association . . . . .	500
4177—Downeyville-Mirkwood-Nemico association . . . . .	450	5100—Oricto-Gynelle-Izo association . . . . .	502
4178—Downeyville-Stewval-Blacktop association . . . . .	453	5101—Oricto-Izo association . . . . .	504
4180—Candelaria-Izo association . . . . .	455	5103—Oricto, dry-Sundown-Oricto association . . . . .	506
4181—Candelaria-Wardenot-Izo association . . . . .	457	5105—Oricto-Luning association . . . . .	508
4182—Candelaria-Gynelle-Izo association . . . . .	459	5106—Oricto-Barnmot-Gynelle association . . . . .	510
4183—Candelaria-Izo, rarely flooded, association . . . . .	461	5107—Oricto-Terlco-Roic association . . . . .	512
4184—Candelaria, dry-Izo association . . . . .	463	5110—Cucamungo Variant gravelly sandy loam, 4 to 15 percent slopes . . . . .	515
4185—Candelaria-Typic Torriorthents association . . . . .	465	6000—Hiridge-Katyblay-Granmount association . . . . .	516
4186—Candelaria-Roic-Izo association . . . . .	466	6001—Hiridge very gravelly sandy loam, 8 to 30 percent slopes . . . . .	518
4188—Candelaria-Downeyville-Annaw association . . . . .	469	6010—Typic Cryorthents, 15 to 50 percent slopes . . . . .	519
4189—Candelaria-Typic Torriorthents, very steep, association . . . . .	471	6020—Celeton-Dumps-Izo association . . . . .	520
4190—Brier-Beelem-Wassit association . . . . .	473	6060—Wiskiflat gravelly loamy sand, 2 to 15 percent slopes . . . . .	522
4191—Brier-Brawley-Rock outcrop association . . . . .	475	6070—Breko-Crunker association . . . . .	523
4192—Brier-Katyblay-Hiridge association . . . . .	477	6071—Breko stony loamy sand, 4 to 15 percent slopes . . . . .	525
4200—Sonoma silt loam . . . . .	480	6072—Breko-Wiskiflat association . . . . .	526
4210—Sagouspe sand, frequently flooded, 0 to 2 percent slopes . . . . .	481	6073—Breko gravelly sandy loam, 2 to 8 percent slopes . . . . .	528
4211—Sagouspe sand, drained, 0 to 2 percent slopes . . . . .	482	6081—Handpah-Breko-Crunker association . . . . .	529
4212—Sagouspe sand, dry, 0 to 4 percent slopes . . . . .	483	6082—Handpah-Breko association . . . . .	531
4220—Patna-Hawsley sands, 0 to 4 percent slopes . . . . .	484	6092—Beelem-Wassit association . . . . .	533
4221—Patna sand, 0 to 2 percent slopes . . . . .	486	6093—Beelem-Stewval-Rock outcrop association . . . . .	535
4230—Typic Torriorthents-Patna-Badland association . . . . .	487	6094—Beelem-Bellehelen-Stewval association . . . . .	537
4240—Typic Torriorthents, 2 to 4 percent slopes . . . . .	489	7000—Logring-Kyler association, steep . . . . .	539
4250—Bango-Hawsley complex, 0 to 4 percent slopes . . . . .	490	7001—Logring-Kyler association . . . . .	541
5010—Mopana-Nire association . . . . .	491	7002—Logring-Eaglepass-Kyler complex, 15 to 75 percent slopes . . . . .	543
5011—Mopana-Holtle Variant association . . . . .	493	7010—Armoine-Beelem association . . . . .	545
5050—Nire-Epvip-Hiridge association . . . . .	495	7012—Armoine-Petspring association . . . . .	547
5051—Nire stony fine sandy loam, 4 to 15 percent slopes . . . . .	497	7020—Squawtip-Brier-Rock outcrop association . . . . .	548
5052—Nire-Hiridge association . . . . .	498	7021—Squawtip-Gabbvally-Rock outcrop association . . . . .	550
		8030—Ravenswood-Brier-Itca association . . . . .	552
		8040—Jetcop-Gabbvally association . . . . .	555
		8050—Itca-Teguro-Rock outcrop association . . . . .	556

# Summary of Tables

---

Temperature and precipitation (table 1) .....	742
Freeze dates in spring and fall (table 2) .....	743
<i>Probability. Temperature.</i>	
Growing season (table 3) .....	743
<i>Probability. Daily minimum temperature during growing season.</i>	
Acreage and proportionate extent of the soils (table 4) .....	744
<i>Acres. Percent.</i>	
Engineering index properties (table 5) .....	750
<i>Depth. USDA texture. Classification—Unified, AASHTO.</i>	
<i>Fragments greater than 3 inches. Percentage passing sieve number—4, 10, 40, 200. Liquid limit. Plasticity index.</i>	
Classification of the soils (table 6) .....	861
<i>Family or higher taxonomic class.</i>	



# Foreword

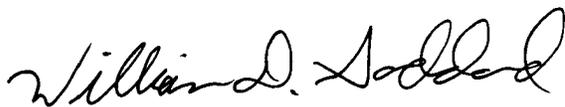
---

This soil survey contains information that can be used in land-planning programs in the survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

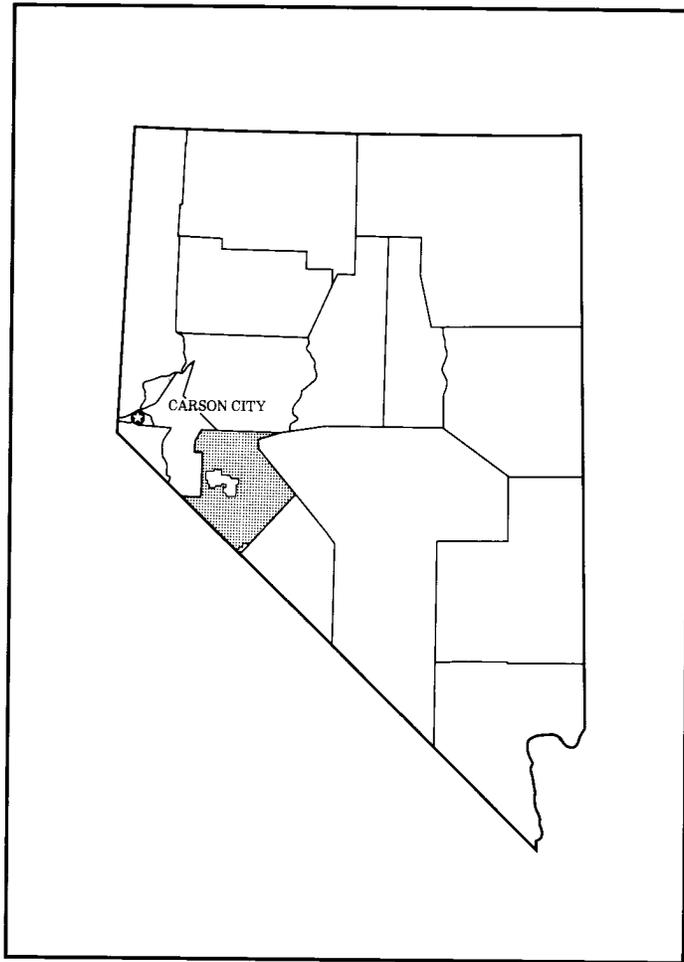
This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the suitability of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



William D. Goddard  
State Conservationist  
Soil Conservation Service



**Location of the Mineral County area in Nevada.**

# Soil Survey of Mineral County Area, Nevada

---

By Edward W. Blake, Soil Conservation Service

Fieldwork by Edward W. Blake, Douglas J. Merkler, James F. Spear, and Carl M. Hasty, Soil Conservation Service; fieldwork on Forest Service area by Harry B. Summerfield, Forest Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with United States Department of the Interior, Bureau of Land Management and Bureau of Indian Affairs; United States Department of Agriculture, Forest Service; and University of Nevada, Agricultural Experiment Station

## General Nature of the Survey Area

John Schelling, district conservationist, Soil Conservation Service, helped prepare this section.

The survey area is made up of 2,285,841 acres. It is in the west-central part of Nevada. The survey area is bordered on the north by Churchill County, on the east by Nye County, on the south by Esmeralda County, and on the west by Lyon County. Mono County, California, borders the survey area on the southwest.

The survey area consists of numerous mountain ranges and valleys. Elevations range from 3,900 feet on the lower valley floors to over 10,500 feet on the highest mountain peaks.

Public lands in the area are administered by the Bureau of Land Management, the Forest Service, and the Bureau of Indian Affairs.

## History

Mineral County was established in 1911, when an increase in mining activities near Hawthorne and in the area surrounding the railroad town of Mina resulted in the division of Esmeralda County. Hawthorne is the county seat.

The county was named for the wide variety of mineral deposits in the area. These include silver, gold, copper, tungsten, iron, andalusite, coal, cinders, perlite,

pumice, sodium phosphate, borax, sodium carbonate, manganese, lead, diatomaceous earth, and many varieties of gemstone rocks.

In 1928, the Department of the Navy acquired 378 square miles of land a few miles from Hawthorne and adjoining the south end of Walker Lake for use as an ammunition depot. Control of this depot, which is said to be the largest of its kind in the world, has since been transferred to the Army.

The five settlements in the survey area include Hawthorne, Mina, Babbitt, Luning, and Schurz. The Walker River Indian Reservation and the community of Schurz are located at the north end of Walker Lake. Approximately 550 members of the Paiute Tribe reside in Schurz and on the reservation. This tribe once ranged through the entire Great Basin area.

Mining activity has flourished in a boom-bust cycle from the mid-1800's to the present. Towns and camps, such as Aurora, Lucky Boy, Oro City, Mountain View, Granite, Dutch Creek, and Rawhide, were founded as a result of gold and silver strikes.

## Water Supply

The survey area is mostly arid or semiarid, but some high elevations on a few mountain ranges receive more than 16 inches of precipitation annually. The precipitation generally decreases at the lower elevations

and amounts to less than 5 inches annually on most of the valley floors. All perennial streams are in the western part of the survey area.

The principal water sources in the survey area are the Walker River and Walker Lake. The river flows into the area at the northwest corner of Mineral County. It is an important water resource for the Walker River Indian Reservation and is the only significant source of water for Walker Lake. Water from the Walker River is impounded for use during the irrigation season at Weber Reservoir, located upstream from the reservation in Mineral and Lyon Counties.

Walker Lake is the sink for the Walker River drainage basin. The upstream watershed for this drainage basin originates on the eastern slope of the Sierra Nevada mountains in California. Snowmelt from the Wassuk Range is an important source of water for the Hawthorne Ammunition Depot at Babbitt and for Hawthorne. Ground water of variable quality is the primary and often the only water supply for communities and individual rural water systems in the survey area.

## Industries and Transportation Facilities

*Tourism and gaming.*—Tourism is considered to be the second most important industry in the survey area. Gaming, recreation, service functions, and retail sales are important aspects of the industry. The gaming revenue for the survey area is largely the result of traffic "passing through" on U.S. Route 95 or State Route 31 to other destinations.

*Manufacturing and government.*—Opportunities for federal government and manufacturing employment are provided by the ammunition depot. This facility has been a major component in the economic base of the survey area. The depot also supports many other jobs indirectly connected to its activities. Since employment levels at the depot are not under local control, efforts to diversify and strengthen the area's economic base continue to be a high priority.

*Mining.*—Although mining generally is a fluctuating type of industry and at present does not represent a large portion of the total economy, it is important to two small communities, Mina and Luning, which serve as shipping points for mining products. A probable regrowth of the mining industry is projected.

*Agriculture and livestock production.*—Agriculture is ranked only sixth among the economic industries in the survey area and is not a major contributing factor in the local economy. Most of the irrigated land is on the Walker River Indian Reservation. Additional small areas are in the vicinity of Whiskey Flat and Queen Valley.

Agricultural production is limited by the available water supply. The majority of the land is used for livestock grazing.

*Forestry.*—There is no commercial sawtimber available in the survey area. Pinyon and juniper, the most common species in interior Nevada, grow in the principal wooded areas on the higher mountain ranges. These species are useful primarily as fuel. The pinyon also produces a large, edible pine nut, which was a staple of the early Indian diet. The pine nut has recently gained popularity as a western delicacy; it is harvested in the fall and sold commercially.

*Transportation facilities.*—Highway 95 is the major transportation artery running north and south in the survey area. It is the main route to Fallon, Yerington, Carson City, and Reno to the north and Tonopah, Bishop, and Las Vegas to the south. Bus and truck lines provide freight and passenger service to the area, and State Route 31 provides a connection with U.S. 395 to the west. The existing network of roads serves most of the survey area. These are all-weather roads, although most of them are unpaved. Limited rail service is provided by a route that passes through Mineral County and ends in Mina. Air service is available from the municipal airport at Hawthorne.

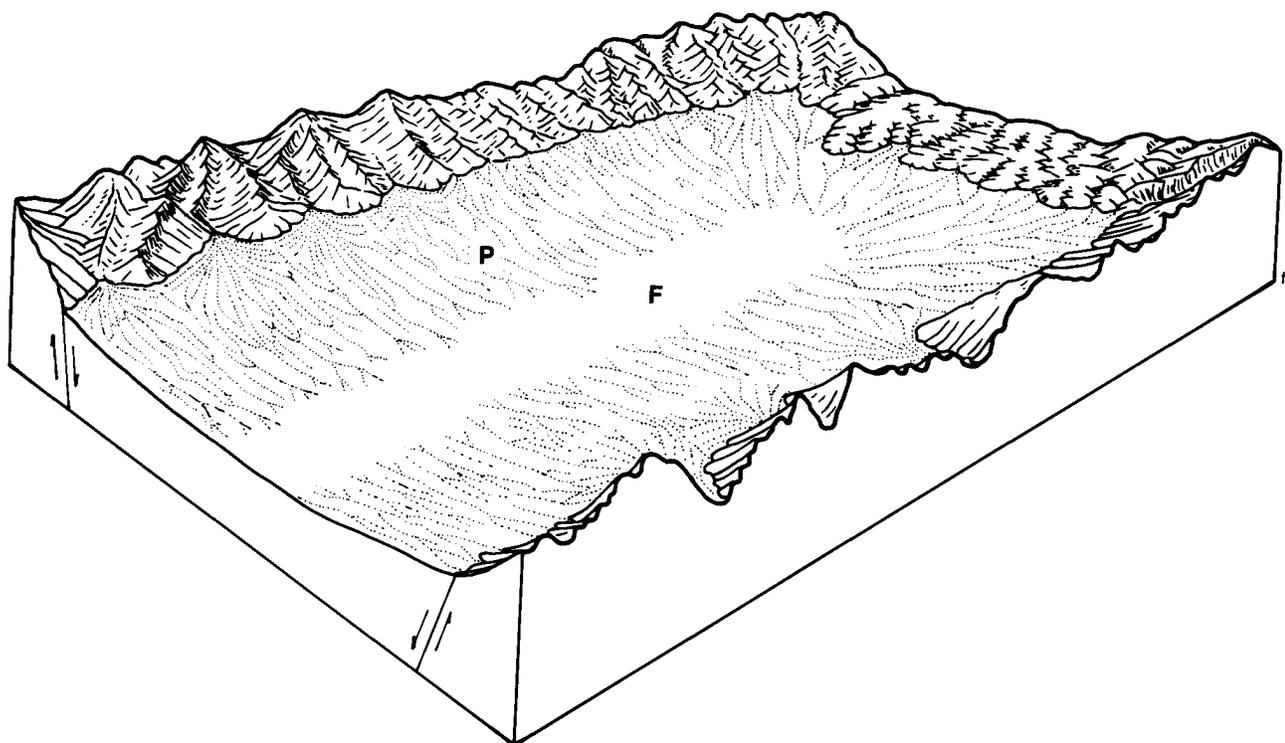
## Drainage

Most of the survey area consists of internally drained basins, or bolsons. These bolsons serve as the end point for intermittent stream channels that carry water during the spring or during periods in the summer when convection storms are common.

Some parts of the survey area are drained by the Walker River or by Rough and Bodie Creeks. The Walker River originates in the Sierra Nevada mountains. It passes through Lyon County and then into Mineral County. It flows out of Weber Reservoir about 15 miles through the northwestern part of the survey area before it empties into Walker Lake. Rough Creek and Bodie Creek are perennial streams that flow across part of the survey area on their way from California to the east fork of the Walker River in Lyon County.

## Soil Landscapes

In this soil survey the mapped areas generally represent associations of two or three soil components and other included soils of limited extent. Soil patterns commonly coincide with landforms and physiographic positions. In the section "Detailed Soil Map Units," descriptive terms are used to identify the location of



**Figure 1.**—The major physiographic parts of an internally drained intermontane basin, or bolson: the piedmont slope (P) and the basin floor, or, more specifically, the bolson floor (F). This drawing shows part of an elongated bolson that has bounding mountain ranges on the near and far sides and is cut off by hills on the far end. The drainageways, shown by dotted lines, suggest positions of major landforms. Neither the playas nor the drainageways on the floor are shown.

individual soil components on the landscape. While there is a relationship between the landforms and soils in a given area, these relationships are not mutually exclusive. Individual soil series commonly occur on more than one component landform.

In this survey area the landforms are classified and defined according to Peterson (13). The landform elements are described and defined in a manner precise enough to indicate where soils occur in relation to each other. The intent of this section is not to define all of the landform terms but to define briefly the main geomorphic surfaces in the survey area. All landform terms are defined in the Glossary.

The landforms of the intermontane basins are first grouped in two general classes—bolson (fig. 1) and semi-bolson (fig. 2). Within these two groups are three major physiographic parts (fig. 3). These are the bounding mountains, the piedmont slope, and the basin floor. The bounding mountains rise more than 1,000 feet above the surrounding boundaries. The piedmont slope and basin floor are topographic forms that slope

from the bounding mountains down to a central playa or axial-stream flood plain.

The shapes, genetic relationships, and geographic scales of the topography seen in the field are used to classify the landforms. The two general classes—bolson and semi-bolson—are successively divided into smaller and genetically more homogeneous classes (charts 1 and 2). The broadest class is major physiographic parts, each of which is made up of several genetically related major landforms. These landforms in turn may be comprised of several genetically related component landforms. The component landforms are the smallest single units that one would consider in combined terms of their form, constituent materials, and genetic history. Some component landforms, such as fan piedmont remnants, have distinctive topographic parts with quite different geomorphic histories. These parts are called landform elements. The landform elements that are erosional surfaces are subdivided into slope components.

In the section "General Soil Map Units," a landscape

position is given for each major component. These generally are major physiographic parts, major landforms, or component landforms. In this section "Detailed Soil Map Units," broad landscape positions are specified for each map unit. These positions apply to the entire unit. They are major physiographic parts or major landforms. A more detailed landscape position also is given for each major component and contrasting inclusion in the map unit. These generally are component landforms, landform elements, or slope components.

## Geology

The geology of the survey area is complex. Most outcrops of pre-Tertiary rocks in this area consist of sedimentary rocks, mainly interbedded limestone,

dolomite, and shale. These rocks are mostly in the southern Gabbs Valley range, the Pilot Mountain area, and the Garfield Hills. Kyler, Logring, and Theriot are typical of the soils that formed in material weathered from these rocks.

The granitic rocks are chiefly quartz monzonite and some granodiorite. They are Cretaceous in age and are correlative with the Sierra Nevada batholith. These rocks are mostly in the Wassuk Range and the western Excelsior Mountains. Budihol, Lazan, Nupart, Petspring, and Uripnes are typical of the soils that formed in material weathered from these rocks.

The volcanic rock in this survey area includes rhyolitic and andesitic tuffs, welded ash-flow tuffs, and basalt and related pyroclastic rocks. Most of these are Miocene or Pliocene in age. One exception is the Excelsior Formation, which consists of andesite and

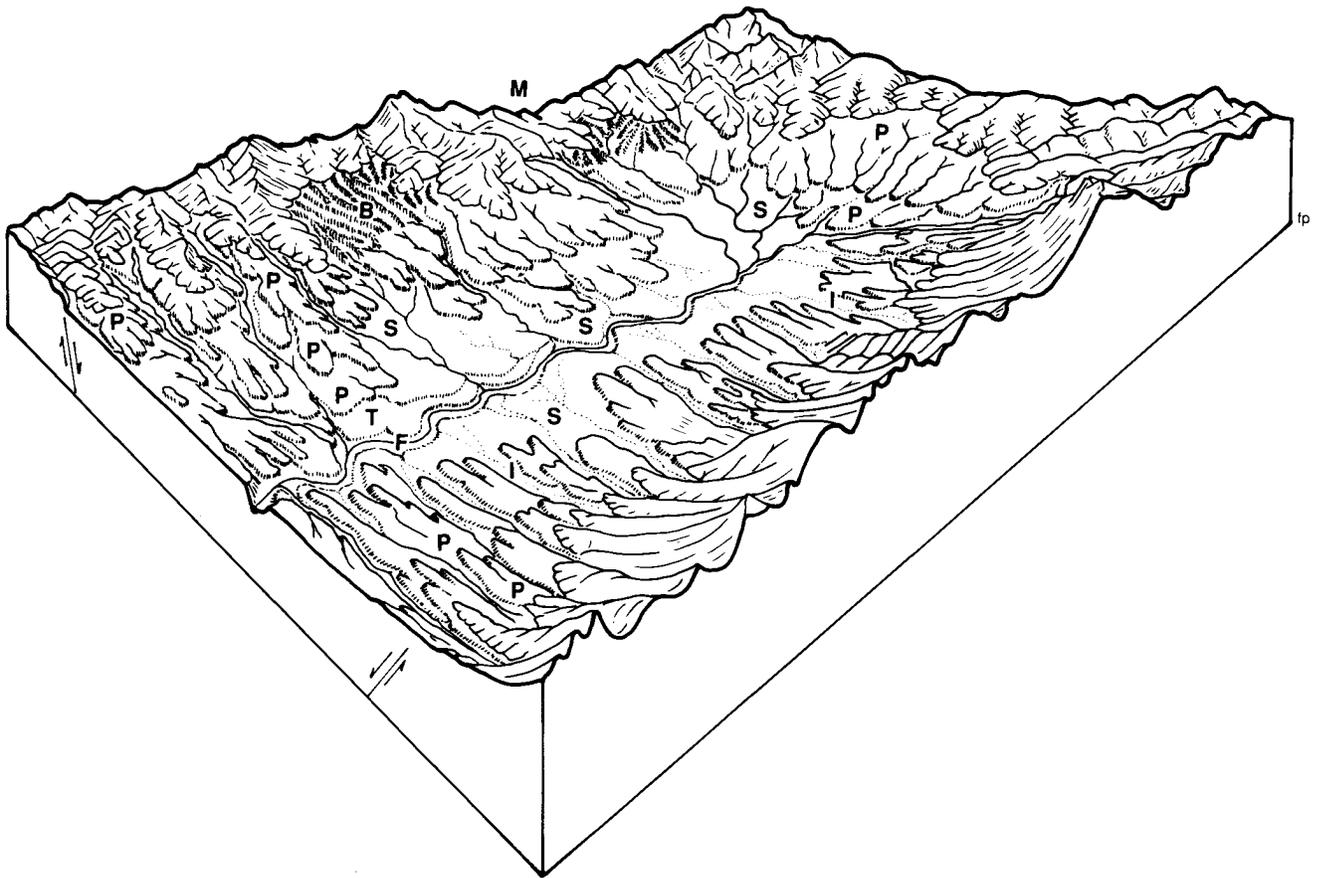
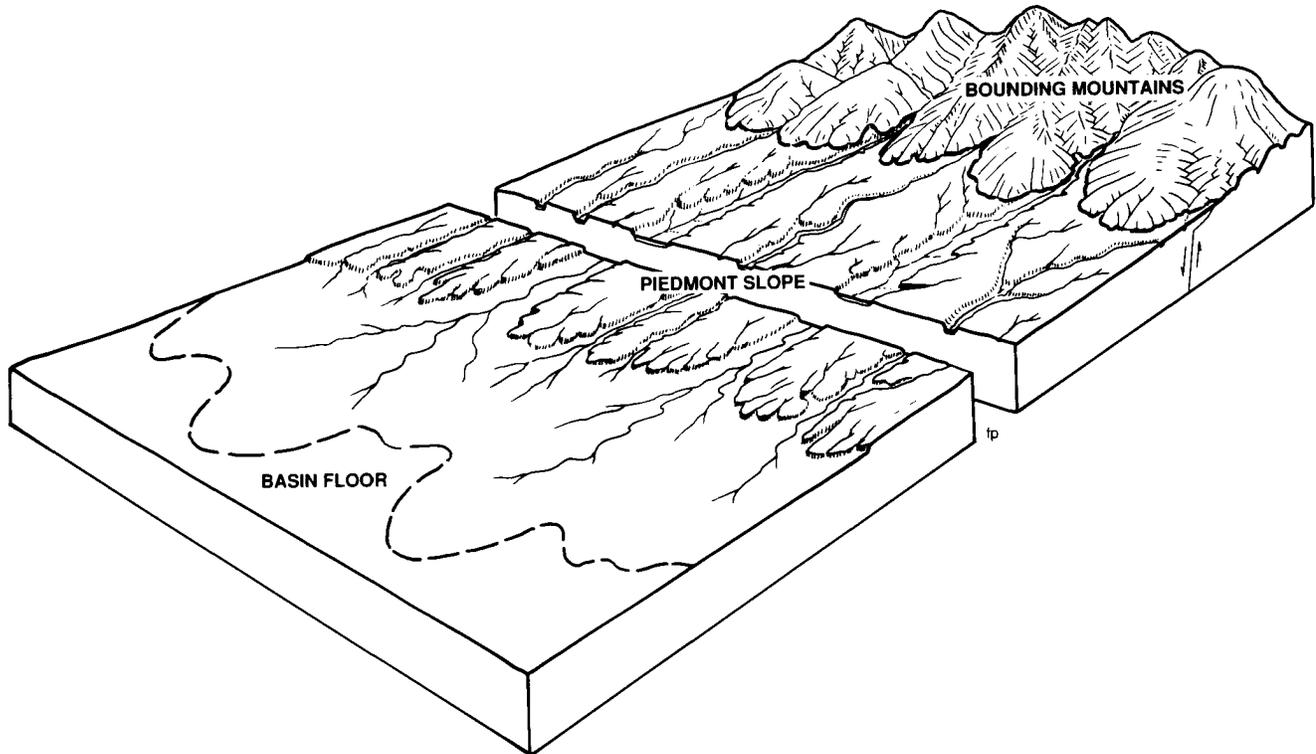


Figure 2.—A semi-bolson that displays the effects of several cycles of dissection and deposition. The major landforms are: ballenas (B); fan piedmonts (P), comprising several levels, or ages, of fan remnants; fan skirts (S); an axial-stream terrace (T); and an axial-stream flood plain (F). Alluvial fans are not distinguished from fan piedmonts. Component landforms of inset fans (I) are between fan remnants. The basin is bounded on two sides by mountains (M).



**Figure 3.—A fan skirt that merges along its lower boundary with a basin floor and that was formed by coalescing alluvial fans originating at gullies cut in a dissected fan piedmont and by debouching inset fans of the fan piedmont. The erosional fan piedmont remnants and mouths of the inset fans form the upper boundary of the fan skirt. The skirt is the same age surface as the inset fans but is younger than the relict summits of the fan remnants. It may be the same age or younger than the basin floor surface, but as shown here it is younger because its alluvium overlaps the basin floor surface.**

rhyolite of Triassic age. These rocks are extensive throughout the survey area. Blacktop, Downeyville, Gabbvally, Garhill, Pintwater, and Stewval are typical of the soils that formed in material weathered from these rocks.

The oldest valley fill in the survey area is sediment of Tertiary age. It consists mainly of fluviolacustrine deposits of siliceous and diatomaceous shale, siltstone, and sandstone. These rocks are predominantly in the Stewart Valley area, but minor amounts are throughout the survey area. Roic, Tert, and Whilphang are typical of the soils that formed in material weathered from these rocks.

The piedmont slopes in the valleys are areas of Quaternary alluvium. Belted, Candelaria, Terlco, and Unsel are typical of the soils that formed in this alluvium.

The youngest material in the area is recent alluvium on the flood plain along the Walker River and on the inset fans and bolson floors of the valleys. Fallon,

Sagouspe, and Slaw are typical of the soils that formed in this material along the Walker River. Annaw, Cirac, Gynelle, Izo, Slaw, and Wardenot are typical of the soils that formed on the inset fans and bolson floors.

## Climate

Prepared by the National Climatic Data Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Mina in the period 1951 to 1980. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 36 degrees F and the average daily minimum temperature is 22 degrees. The lowest temperature on record, which occurred at Mina on January 12, 1963, is -9 degrees. In summer, the average temperature is 74 degrees and the average daily maximum temperature is 92 degrees.

CHART 1.—CLASSIFICATION OF BOLSON LANDFORMS

I Major physiographic part	Landforms		Parts of landforms	
	II Major landform	III Component landform	IV Landform element	V Slope component
Bounding mountains Piedmont slope	Mountain valley fan	Erosional fan remnant	Summit	Shoulder slope Back slope Foot slope
			Side slope .....	
			Partial ballena .....	
	Rock pediment	Inset fan Rock pediment remnant	Channel	Crest Shoulder slope Back slope Foot slope
			Channel	
			Summit, or .....	
	Ballena .....	.....	Side slope .....	Back slope Foot slope
			Channel	Crest Shoulder slope Back slope Foot slope
			.....	.....
	Alluvial fan	Inset fan Fan collar Erosional fan remnant	Channel	Shoulder slope Back slope Foot slope
Channel				
Channel				
Summit				
Fan piedmont	Inset fan Erosional fan remnant	Side slope .....	Shoulder slope Back slope Foot slope	
		.....	Crest Shoulder slope Back slope Foot slope	
		Channel	Shoulder slope Back slope Foot slope	
		Channel		
Fan skirt .....	Inset fan Fan apron Nonburied fan remnant Beach terrace	Summit	Shoulder slope Back slope Foot slope	
		Side slope .....		
		Beach terrace		Crest Shoulder slope Back slope
Basin floor (bolson floor)	Alluvial flat	Relict alluvial flat Recent alluvial flat	Channel	Shoulder slope Back slope Foot slope
			Channel	
	Alluvial plain Sand sheet	Sand dune (Parna dune)	Interdune flat	Crest Shoulder slope Back slope
			.....	
	Lake plain Playa	Lake-plain terrace Flood-plain playa	Channel	Shoulder slope Back slope
			Channel	

CHART 2.—CLASSIFICATION OF SEMI-BOLSON LANDFORMS

Landforms			Parts of landforms	
I Major physiographic part	II Major landform	III Component landform	IV Landform element	V Slope component
Bounding mountains Piedmont slope	Mountain valley fan	Erosional fan remnant	Summit	Shoulder slope Back slope Foot slope
			Side slope .....	
			Partial ballena .....	
	Rock pediment	Inset fan Rock pediment remnant	Channel	Crest Shoulder slope Back slope Foot slope
			Channel	
			Summit, or .....	
	Ballena .....	.....	Side slope .....	Crest Shoulder slope Back slope Foot slope
			Channel	
			Channel	
	Alluvial fan	Inset fan Fan collar Erosional fan remnant	Channel	Shoulder slope Back slope Foot slope
			Channel	
			Summit	
Fan piedmont	Inset fan Erosional fan remnant	Side slope .....	Crest Shoulder slope Back slope Foot slope	
		Partial ballena .....		
		Channel		
Pediment	.....	Channel	Shoulder slope Back slope Foot slope	
		Channel		
		Summit		
Fan skirt .....	.....	Pediment remnant	Shoulder slope Back slope Foot slope	
		Side slope .....		
		Channel		

CHART 2.—CLASSIFICATION OF SEMI-BOLSON LANDFORMS—Continued

Landforms			Parts of landforms	
I Major physiographic part	II Major landform	III Component landform	IV Landform element	V Slope component
Basin floor (semi-bolson floor)	Alluvial flat	Relict alluvial flat Recent alluvial flat	Channel Channel	
	Alluvial plain ...	Basin-floor remnant	Summit Side slope .....	Shoulder slope Back slope Foot slope
			Partial ballena .....	Crest Shoulder slope Back slope Foot slope
		Inset fan	Channel Channel	
	Sand sheet	Sand dune		
	Axial-stream flood plain	Flood-plain playa Stream terrace River terrace	Channel Summit Side slope .....	Shoulder slope Back slope Foot slope

The highest recorded temperature, which occurred at Mina on July 27, 1975, is 107 degrees.

Growing degree days are shown in table 3. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 5.4 inches. Of this, 3 inches, or about 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 2 inches. The heaviest 1-day rainfall during the period of record was 2.52 inches at Mina on October 2, 1972. Thunderstorms occur on about 15 days each year.

The average seasonal snowfall is 8 inches. The greatest snow depth at any one time during the period of record was 6 inches. On the average, 1 day of the year has at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 30 percent. Humidity is higher at night, and the average at dawn is about 70 percent. The sun shines

90 percent of the time possible in summer and 70 percent in winter. The prevailing wind is from the west. Average windspeed is highest, 8 miles per hour, in spring.

## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. The fieldwork in the northern one-third of the survey area was done by soil scientists employed by the Soil Conservation Service, and the fieldwork in the southern two-thirds of the area was done by soil scientists employed by Soil and Land Use Technology, Inc., which was under contract to the Bureau of Land Management. The soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The

unconsolidated material is devoid of roots and most other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil or miscellaneous area is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how they were formed. During mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

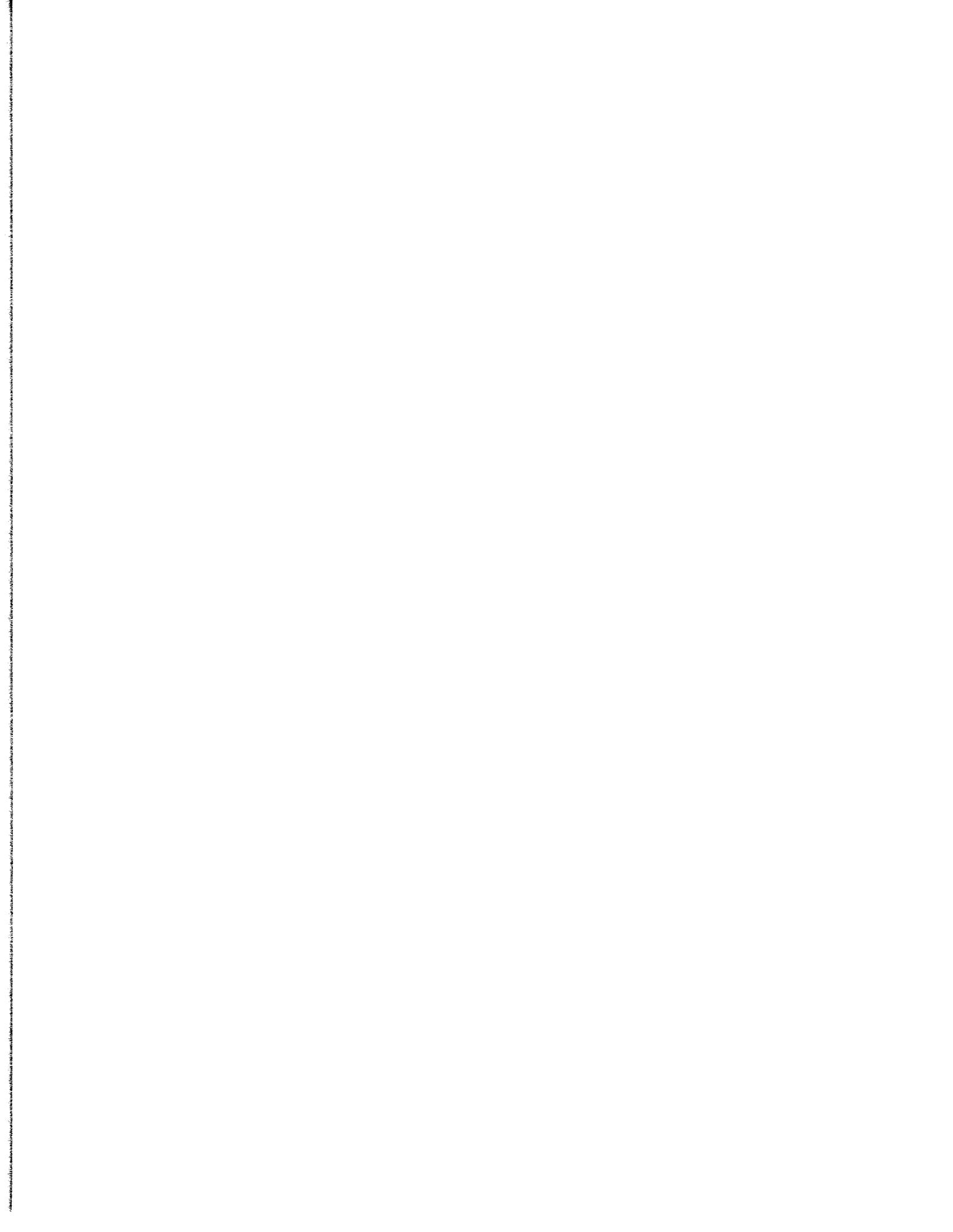
Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes. Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons

within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.



# General Soil Map Units

---

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The soils or miscellaneous areas making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils or miscellaneous areas can be identified on the map. Likewise, areas that are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

In the descriptions of the general soil map units, a landscape position for each major component is specified. The landscape components are usually selected from the more general categories—major physiographic parts (such as mountains), major landforms (such as fan piedmonts), or component landforms (such as inset fans).

Figure 4 illustrates how the general soil map units relate to the various broad landscapes. The map units in figure 4 are representative of those on a bolson that is an internally drained intermontane basin. The associated landforms for the dominant component soils represented in map unit 1 are alluvial flat, lake plain, flood-plain playa, and playa; in map unit 4, fan piedmont and fan skirt; in map unit 5, fan piedmont and ballena; in map unit 9, hills and the lower mountains; and in map unit 10, mountains and the higher hills. The positions for each component soil, in terms of major landform or component landforms, are indicated in the

respective map unit descriptions.

The descriptions, names, and delineations of soils in this soil survey do not fully agree with those in the surveys of adjacent areas. Differences are the result of a better knowledge of soils, modifications in series concepts, and variations in the intensity of mapping or in the extent of the soils within the survey areas.

## Map Unit Descriptions

### Areas Dominated by Soils on Bolson and Semi-Bolson Floors

The soils in this group are dominantly on alluvial flats, lake plains, flood-plain playas, flood plains, and river terraces. Elevations range from 3,900 to 5,600 feet. The average annual precipitation is 4 to 8 inches, the average annual air temperature is 50 to 54 degrees F, and the frost-free season ranges from 120 to 160 days. This group makes up about 5 percent of the survey area.

#### 1. Typic Torrifluvents-Playas-Aeric Halaquepts

*Very deep, nearly level, poorly drained to well drained soils and playas; on alluvial flats, lake plains, and flood-plain playas*

This map unit makes up about 4 percent of the survey area.

Typic Torrifluvents, represented by the Slaw and Cirac series, are well drained soils on alluvial flats and flood-plain playas. Typically, they are stratified, averaging between moderately coarse and moderately fine textured. These soils are strongly affected by salts. The vegetation is mainly black greasewood and seepweed.

Playas are sink areas on the bottom of bolson floors. They support no vegetation. Water is ponded in these areas after spring rains and summer convection storms.

Aeric Halaquepts, represented by the Nuyobe and Wabuska series, are poorly drained and somewhat

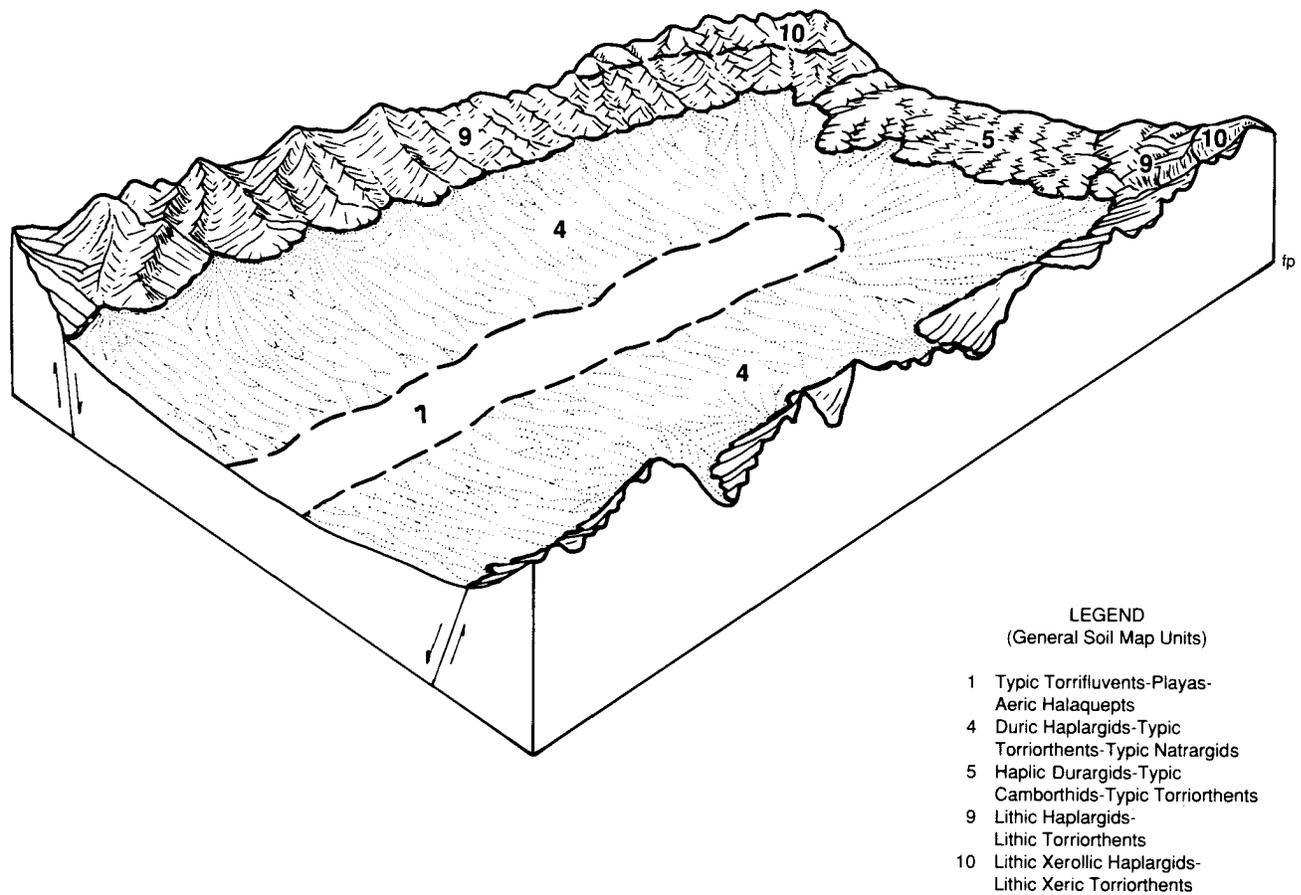


Figure 4.—General soil map units representative of those on a bolson that is an internally drained intermontane basin.

poorly drained soils on lake plains. Typically, they are stratified with moderately coarse to moderately fine textures throughout. These soils are strongly affected by salts and sodium. The vegetation is mainly black greasewood and inland saltgrass.

Of minor extent in this unit are Typic Torripsamments (Isolde soils) and Aquic Torriorthents (Dedmount soils). Isolde soils are coarse textured and are on semistabilized sand dunes. The vegetation on these soils is mainly black greasewood, shadscale, fourwing saltbush, and Indian ricegrass. The Dedmount soils are moderately well drained and fine textured. They are on the slightly higher lake plains. The vegetation on these soils is mainly Torrey quailbush, black greasewood, and shadscale.

This map unit is used for rangeland and wildlife habitat. The suitability for irrigated crops is limited by the salinity and an inadequate supply of irrigation water.

## 2. Typic Torrifluvents-Aquic Xerofluvents-Aeric Fluvaquents

*Very deep, nearly level, poorly drained to well drained soils; on river terraces, lake plains, and flood plains*

This map unit makes up about 1 percent of the survey area.

Typic Torrifluvents, represented by the Slaw series, are well drained soils on river terraces. They are stratified with moderately coarse to moderately fine textures throughout. The profile averages medium textured. These soils are strongly affected by salts, except in reclaimed areas. The vegetation is mainly Torrey quailbush, black greasewood, and shadscale.

Aquic Xerofluvents, represented by the Fallon and Sagouspe series, are somewhat poorly drained to well drained soils on flood plains and river terraces. These soils are stratified with coarse to moderately fine

textures throughout. They are slightly or moderately affected by salts. The vegetation is mainly Torrey quailbush, black greasewood, and shadscale.

Aeric Fluvaquents, represented by the Sonoma series, are poorly drained soils on lake plains. They are stratified with coarse to moderately fine textures throughout. The profile averages moderately fine textured. These soils are not affected by salts. The vegetation is mainly rush, meadow barley, and inland saltgrass.

Of minor extent in this unit are water areas, Aeric Halaquepts (Nuyobe soils), and Typic Torriorthents. The water areas include Weber Reservoir and the Walker River. Nuyobe soils are poorly drained and are on flood plains. They are strongly affected by salts and sodium. The vegetation on these soils is mainly inland saltgrass and black greasewood. Typic Torriorthents are coarse textured soils on beaches. The vegetation on these soils is mainly Nevada ephedra, shadscale, and Indian ricegrass.

This map unit is used for rangeland, irrigated cropland, or wildlife habitat. The suitability for irrigated crops is somewhat limited by the salinity and a high water table.

### **Areas Dominated by Soils on Piedmont Slopes**

The soils in this group are dominantly on fan piedmonts, fan skirts, sand sheets, and ballenas. Elevations range from 3,900 to 7,600 feet. The average annual precipitation ranges from 4 inches at the lower elevations to 10 inches at the higher elevations, the average annual air temperature is 47 to 54 degrees F, and the frost-free season ranges from 100 to 160 days. This group makes up about 37 percent of the survey area.

### **3. Typic Torripsamments**

*Very deep, gently sloping to strongly sloping, somewhat excessively drained or excessively drained soils; on sand sheets and dunes*

This map unit makes up about 8 percent of the survey area.

Typic Torripsamments, represented by the Hawsley, Isolde, Stumble, and Sundown series, are somewhat excessively drained or excessively drained soils on sand sheets and semistabilized sand dunes. These soils are coarse textured throughout. The vegetation is mainly Indian ricegrass, fourwing saltbush, and littleleaf horsebrush on the sand sheets and hairy horsebrush,

Indian ricegrass, and fourwing saltbush on the semistabilized dunes.

Of minor extent in this map unit are Typic Torriorthents (Luning soils) and Typic Haplargids (Oricto, Rednik, and Patna soils). Luning soils are on fan skirts mantled with thin sand sheets. The vegetation on these soils is mainly Indian ricegrass, fourwing saltbush, and littleleaf horsebrush. Oricto, Rednik, and Patna soils are very deep and well drained. They are on fan piedmont remnants and lake-plain terraces. The vegetation on these soils is mainly shadscale, Cooper wolfberry, and Bailey greasewood.

This map unit is used for rangeland and wildlife habitat.

### **4. Duric Haplargids-Typic Torriorthents-Typic Natrargids**

*Very deep, gently sloping to moderately steep, well drained to excessively drained soils; on fan piedmonts and fan skirts*

This map unit makes up about 9 percent of the survey area. The vegetation is mainly shadscale, Bailey greasewood, Cooper wolfberry, and spiny menodora.

Duric Haplargids, represented by the Unsel series, are nearly level to moderately steep, well drained soils on fan piedmont remnants. They typically have a moderately coarse to medium textured surface layer, a medium or moderately fine textured subsoil, and a coarse textured substratum.

Typic Torriorthents, represented by the Izo and Gynelle series, are gently sloping to moderately sloping, somewhat excessively drained or excessively drained soils on fan skirts and inset fans and in channels. These soils typically are stratified and coarse textured throughout.

Typic Natrargids, represented by the Terlco series, are gently sloping to moderately steep, well drained soils on fan piedmont remnants. They typically have a moderately coarse to medium textured surface layer, a medium to moderately fine textured subsoil, and a coarse textured substratum.

Of minor extent in this unit are Typic Camborthids (Annaw and Eastgate soils), Typic Torripsamments (Sundown soils), and Haplic Durargids (Belted soils). Annaw and Eastgate soils are on inset fans, and Sundown soils are on sand sheets. Belted soils are shallow over a duripan and are on the slightly higher fan piedmont remnants.

This map unit is used for rangeland and wildlife habitat.

## 5. Haplic Durargids-Typic Camborthids-Typic Torriorthents

*Very shallow to very deep, nearly level to moderately steep, well drained to excessively drained soils; on fan piedmonts and ballenas*

This map unit makes up about 4 percent of the survey area. The vegetation is mainly shadscale, Bailey greasewood, spiny menodora, galleta, and Indian ricegrass.

Haplic Durargids, represented by the Belted and Deefan series, are very shallow or shallow, gently sloping to moderately steep, well drained soils on fan piedmont remnants and ballenas. They typically have a moderately coarse to medium textured surface layer and a medium to fine textured subsoil over a duripan, which is underlain by a coarse textured substratum.

Typic Camborthids, represented by the Annaw and Koyen series, are very deep, gently sloping or moderately sloping, well drained soils on inset fan remnants. They typically have a coarse or moderately coarse textured surface layer, a moderately coarse textured subsoil, and a coarse textured substratum.

Typic Torriorthents, represented by the Izo and Wardenot series, are very deep, nearly level to moderately sloping, somewhat excessively drained or excessively drained soils on inset fans and in channels. These soils typically are stratified and coarse textured throughout.

Of minor extent in this map unit are Typic Natrargids (Terlco soils), Entic Durorthids (Truhoy soils), and Typic Durargids (Cleaver soils). Truhoy soils are on fan piedmont remnants. Terlco soils are on the lower fan piedmont remnants, and Cleaver soils are on the higher fan piedmont remnants.

This map unit is used for rangeland and wildlife habitat.

## 6. Typic Calciorthids-Typic Torriorthents

*Very deep, gently sloping to moderately steep, well drained to excessively drained soils; on fan piedmonts and fan skirts*

This map unit makes up about 7 percent of the survey area. The vegetation is mainly shadscale, Bailey greasewood, spiny menodora, galleta, and Indian ricegrass.

Typic Calciorthids, represented by the Candelaria series, are very deep, gently sloping to moderately steep, well drained soils on fan piedmont remnants. They typically have a moderately coarse textured

surface layer and subsoil and a coarse textured substratum.

Typic Torriorthents, represented by the Izo and Wardenot series and the Typic Torriorthents subgroup, are very deep, gently sloping to moderately steep, somewhat excessively drained or excessively drained soils on inset fans and fan skirts and in channels. These soils typically are stratified and coarse textured throughout.

Of minor extent in this map unit are Typic Torriorthents (Roic soils), Typic Torripsamments (Sundown soils), Lithic Haplargids (Downeyville soils), and Entic Durorthids (Truhoy soils). Roic soils are very shallow over semiconsolidated Tertiary sedimentary rock. They are on rock pediment remnants. Sundown soils are coarse textured and are on sand sheets. Downeyville soils are very shallow over volcanic rock. They are on hills. Truhoy soils are very shallow over a duripan. They are on fan piedmont remnants.

This map unit is used for rangeland and wildlife habitat.

## 7. Xerollic Haplargids-Durorthidic Xeric Torriorthents

*Very deep, gently sloping to strongly sloping, well drained soils; on fan piedmonts*

This map unit makes up about 6 percent of the survey area. The vegetation is mainly Wyoming big sagebrush, rabbitbrush, needlegrass, Nevada ephedra, and Indian ricegrass.

Xerollic Haplargids, represented by the Rattleflat series, are on fan piedmont remnants. They typically have a coarse or moderately coarse textured surface layer, a moderately coarse or medium textured subsoil, and a coarse to moderately coarse textured substratum.

Durorthidic Xeric Torriorthents, represented by the Crunker series, are on inset fans and fan aprons. They typically are coarse textured throughout, but they have strata of moderately coarse textured material in some areas.

Of minor extent in this map unit are Durixerollic Haplargids (Wedlar soils), Xerollic Durargids (Chuckridge soils), Xeric Torriorthents (Crunkvar and Wrango soils), Haplic Durargids (Smedley soils), and Durixerollic Calciorthids (Armespan and Dakent soils). Wedlar soils are on fan piedmont remnants. Chuckridge soils are shallow over a duripan and are on the higher fan piedmont remnants. The vegetation on the Chuckridge soils is mainly black sagebrush, Nevada ephedra, and galleta. Crunkvar and Wrango soils are in

interplateau and intermontane basins. Smedley soils are shallow over a duripan and are on fan piedmont remnants at the lower elevations. The vegetation on the Smedley soils is mainly shadscale, Bailey greasewood, Indian ricegrass, and galleta. Armespan and Dakent soils are on fan piedmont remnants. Their parent material is dominantly limestone residuum.

This map unit is used for rangeland and wildlife habitat.

#### **8. Haploxerollic Durargids-Xerollic Durargids-Xerollic Camborthids**

*Shallow to very deep, gently sloping to moderately steep, well drained soils; on fan piedmonts and ballenas*

This map unit makes up about 3 percent of the survey area.

Haploxerollic Durargids, represented by the Mickey series, are shallow soils on fan piedmont remnants and ballenas. They typically have a moderately coarse textured surface layer and a medium textured subsoil over a duripan, which is underlain by a coarse and moderately coarse textured substratum. The vegetation is mainly low sagebrush, Nevada ephedra, rabbitbrush, and galleta.

Xerollic Durargids, represented by the Handpah series, are moderately deep soils on fan piedmont remnants. They typically have a coarse textured surface layer and a medium to moderately fine textured subsoil over a duripan, which is underlain by a coarse to moderately coarse textured substratum. The vegetation is mainly Wyoming big sagebrush, Nevada ephedra, Indian ricegrass, rabbitbrush, and galleta.

Xerollic Camborthids, represented by the Veet series, are very deep soils on inset fans. They typically are moderately coarse textured throughout, but they have strata of coarse textured material in the substratum. The vegetation is mainly Wyoming big sagebrush, rabbitbrush, Nevada ephedra, Indian ricegrass, and galleta.

Of minor extent in this map unit are Durixerollic Haplargids (Wedlar soils), Abruptic Xerollic Durargids (Fulstone soils), and Typic Durargids (Cleaver soils). Wedlar soils are on the lower fan piedmont remnants and ballenas. Fulstone soils are on fan piedmont remnants. Cleaver soils are shallow over a duripan and are on fan piedmont remnants at the lower elevations. The vegetation on the Cleaver soils is mainly shadscale and Bailey greasewood.

This map unit is used for rangeland and wildlife habitat.

#### **Areas Dominated by Soils on Hills, Low Mountains, and Rock Pediments**

The soils in this group are dominantly on hills, low mountains, and rock pediments. Elevations range from 4,100 at the base of the hills to 8,000 feet on the summits of the mountains. The average annual precipitation is 4 to 10 inches, the average annual air temperature is 47 to 54 degrees F, and the frost-free season ranges from 110 to 130 days. This group makes up about 39 percent of the survey area.

#### **9. Lithic Haplargids-Lithic Torriorthents**

*Very shallow or shallow, moderately steep to very steep, well drained or somewhat excessively drained soils; on the lower mountains and hills*

This map unit makes up about 20 percent of the survey area. The vegetation is mainly shadscale, Bailey greasewood, Nevada ephedra, spiny menodora, desert needlegrass, and galleta.

Lithic Haplargids, represented by the Downeyville series, are well drained soils. They typically have a moderately coarse textured surface layer and a medium or moderately fine textured subsoil, which is underlain by bedrock.

Lithic Torriorthents, represented by the Blacktop and Pintwater series, are well drained, shallow or very shallow soils. They typically are moderately coarse textured above the bedrock.

Of minor extent in this map unit are Typic Durorthids (Garhill soils), Lithic Xerollic Haplargids (Gabbvally soils), and Rock outcrop. Garhill soils are on plateaus. Gabbvally soils are on north-facing mountain slopes at the higher elevations. The vegetation on the Gabbvally soils is mainly Wyoming big sagebrush and Sandberg bluegrass. Rock outcrop is in scattered areas throughout the unit.

This map unit is used for rangeland and wildlife habitat.

#### **10. Lithic Xerollic Haplargids-Lithic Xeric Torriorthents**

*Very shallow or shallow, moderately steep to very steep, well drained soils; on mountains and the upper hills*

This map unit makes up about 16 percent of the survey area. The vegetation is mainly Wyoming big sagebrush, black sagebrush, Nevada ephedra, rabbitbrush, Indian ricegrass, bluegrass, and galleta.

Lithic Xerollic Haplargids, represented by the Stewval and Gabbvally series, typically have a moderately

coarse or medium textured surface layer and a medium to moderately fine textured subsoil, which is underlain by bedrock.

Lithic Xeric Torriorthents, represented by the Lomoiné and Tejabé series, typically are moderately coarse textured above the bedrock.

Of minor extent are Xerollic Durargids (Argalt soils), Lithic Xeric Torriorthents (Logring and Beelem soils), Lithic Haplargids (Downeyville soils), Lithic Argixerolls (Bellehelen soils), and Xerollic Haplargids (Breko soils). Argalt soils are very shallow over a duripan and are on plateaus. Logring and Beelem soils are very shallow over bedrock and are on hills and mountains. The vegetation on the Logring and Beelem soils is mainly Utah juniper, singleleaf pinyon, and black sagebrush. Downeyville soils are very shallow over bedrock and are on the lower hills. The vegetation on these soils is mainly shadscale, Bailey greasewood, desert needlegrass, and galleta. Bellehelen soils are very shallow over bedrock and are on the higher north-facing and sheltered mountains. The vegetation on these soils is mainly singleleaf pinyon, black sagebrush, and Sandberg bluegrass. Breko soils are very deep and are on fan piedmonts and mountain valley fans.

This map unit is used for rangeland and wildlife habitat.

### 11. Xeric Torriorthents-Typic Torriorthents

*Very shallow or shallow, moderately sloping to steep, well drained soils; on hills and rock pediments*

This map unit makes up about 3 percent of the survey area. The major soils are underlain by semiconsolidated Tertiary sedimentary rock.

Xeric Torriorthents, represented by the Haar and Tert series, typically are moderately coarse to medium textured throughout. Where these soils are very shallow, the vegetation is mainly Utah juniper, black sagebrush, cliffrose, shadscale, and Nevada ephedra. Where they are shallow, the vegetation is mainly black sagebrush, Nevada ephedra, Douglas rabbitbrush, and bottlebrush squirreltail.

Typic Torriorthents, represented by the Roic series, are very shallow soils. They typically are moderately coarse textured throughout. The vegetation is mainly shadscale, Bailey greasewood, Indian ricegrass, and galleta.

Of minor extent in this map unit are Durixerollic Calciorthids (Dakent soils), Xeric Torriorthents (Wrango soils), Badland, Typic Natrargids (Terlco soils), and Typic Torriorthents (Izo and Bluewing soils). Dakent

soils are very deep and are on fan piedmont remnants. Wrango soils are very deep and are on inset fans. The Badland supports no vegetation. Terlco soils are very deep and are on fan piedmont remnants. Izo and Bluewing soils are very deep and are on inset fans.

This map unit is used mainly for rangeland and wildlife habitat.

### Areas Dominated by Soils on High Mountains and Plateaus

The soils in this group are dominantly on high mountains and plateaus. Elevations range from 6,600 feet to over 15,000 feet. The average annual precipitation ranges from 10 inches at the lower elevations to 17 inches at the higher elevations, the average annual air temperature is 41 to 47 degrees F, and the frost-free season ranges from 60 to 100 days. This group makes up about 19 percent of the survey area.

### 12. Typic Xerorthents-Lithic Mollic Haploxeralfs-Entic Haploxerolls

*Very shallow, moderately steep to very steep, well drained or somewhat excessively drained soils; on mountains*

This map unit makes up about 11 percent of the survey area.

Typic Xerorthents, represented by the Powment and Lazan series and the Lazan Family, are somewhat excessively drained soils. They typically are coarse textured throughout and are underlain by granitic bedrock. The vegetation is mainly singleleaf pinyon, Wyoming big sagebrush, antelope bitterbrush, and desert needlegrass.

Lithic Mollic Haploxeralfs, represented by the Wassit series, are well drained soils. They typically have a moderately coarse to medium textured surface layer and a moderately fine or fine textured subsoil, which is underlain by volcanic bedrock. The vegetation is mainly singleleaf pinyon, mountain big sagebrush, antelope bitterbrush, and Sandberg bluegrass.

Entic Haploxerolls, represented by the Nupart series, are somewhat excessively drained soils. They typically are coarse textured throughout and are underlain by granitic bedrock. The vegetation is mainly singleleaf pinyon, mountain big sagebrush, antelope bitterbrush, and Sandberg bluegrass.

Of minor extent in this map unit are Lithic Argixerolls (Loomer soils and the Madeline Family), Lithic Xeric Torriorthents (Beelem soils), Xerollic Haplargids

(Bouncer soils), Mollic Palexeralfs (Brawley soils), Rock outcrop, and Aridic Argixerolls (Epvip soils). Loomer soils and the Madeline Family are shallow and are on the lower mountains. The vegetation on these soils is mainly low sagebrush and Sandberg bluegrass. Beelem soils are very shallow. They are on the more eroded, lower mountain slopes and on south-facing slopes. Bouncer soils are shallow and are on the lower mountains. Brawley soils are moderately deep and are on mountains. The Rock outcrop is in scattered areas throughout the unit. Epvip soils are on mountains.

This map unit is used for grazable woodland and wildlife habitat.

### 13. Typic Argixerolls-Lithic Argixerolls

*Shallow or moderately deep, moderately steep or steep, well drained soils; on mountain slopes*

This map unit makes up about 1 percent of the survey area.

Typic Argixerolls, represented by the Squawtip and Ravenswood series, are moderately deep soils. They typically have a medium textured surface layer and a moderately fine or fine textured subsoil, which is underlain by bedrock. The vegetation is mainly singleleaf pinyon, mountain big sagebrush, antelope bitterbrush, and Sandberg bluegrass.

Lithic Argixerolls, represented by the Itca and Teguro series, are shallow soils. They typically have a medium textured surface layer and a moderately fine or fine textured subsoil, which is underlain by bedrock. The vegetation is mainly singleleaf pinyon, mountain big sagebrush, antelope bitterbrush, and Sandberg bluegrass. At the lower elevations Wyoming big sagebrush is common instead of mountain big sagebrush.

Of minor extent in this map unit are Lithic Xerollic Haplargids (Gabbvally soils), Aridic Duric Haploxerolls (Holtle Variant soils), and Rock outcrop. Gabbvally soils are on the lower mountain slopes. The vegetation on these soils is mainly Wyoming big sagebrush, Nevada ephedra, and bottlebrush squirreltail. Holtle Variant soils are deep and are in small intermontane basins. The vegetation on these soils is mainly mountain big sagebrush, basin big sagebrush, and bottlebrush squirreltail. The Rock outcrop is in scattered areas throughout the unit.

This map unit is used for grazable woodland and wildlife habitat. The soils in this unit are poorly suited to range seeding because of rock fragments on the surface.

### 14. Abruptic Durixeralfs-Abruptic Xerollic Durargids-Xerollic Durargids

*Shallow or moderately deep, gently sloping to moderately steep, well drained soils; on plateaus*

This map unit makes up about 5 percent of the survey area.

Abruptic Durixeralfs, represented by the Borealis series, are moderately deep, moderately sloping to moderately steep soils. They typically have a moderately coarse textured surface layer and a fine textured subsoil, which is underlain by a duripan. The vegetation is mainly singleleaf pinyon, mountain big sagebrush, and antelope bitterbrush.

Abruptic Xerollic Durargids, represented by the Antholop series, are shallow, gently sloping to strongly sloping soils. They typically have a moderately coarse textured surface layer and a fine textured subsoil, which is underlain by a duripan. The vegetation is mainly low sagebrush, rabbitbrush, bottlebrush squirreltail, and galleta.

Xerollic Durargids, represented by the Ratto Family, are shallow, gently sloping to strongly sloping soils. They typically have a coarse textured surface layer and a fine textured subsoil, which is underlain by a duripan. The vegetation is mainly low sagebrush, bottlebrush squirreltail, and galleta.

Of minor extent in this map unit are Aridic Duric Haploxerolls (Holtle Variant soils), Xeric Torriorthents (Fadoll soils), Abruptic Aridic Durixerolls (Mopana soils), and Rock outcrop. Holtle Variant soils are deep and are in interplateau basins. The vegetation on these soils is mainly mountain big sagebrush, basin big sagebrush, and bottlebrush squirreltail. Fadoll soils are very deep and are in interplateau basins. The vegetation on these soils is mainly Wyoming big sagebrush and bottlebrush squirreltail. Mopana soils are shallow and are on the higher plateau summits. The vegetation on these soils is mainly low sagebrush and bluegrasses. The Rock outcrop is in scattered areas throughout the unit. It occurs mainly as rimrock on the edges of the plateaus.

This map unit is used for grazable woodland, rangeland, and wildlife habitat.

### 15. Argic Pachic Cryoborolls-Pachic Cryoborolls-Argic Cryoborolls

*Shallow to very deep, moderately sloping to very steep, well drained soils; on mountains and plateaus*

This map unit makes up about 2 percent of the survey area.

Argic Pachic Cryoborolls, represented by the Kiote and Nire series, are very deep soils on mountains and plateaus. They typically have a moderately coarse textured surface layer, a medium to fine textured subsoil, and a moderately coarse to medium textured substratum. The vegetation is mainly mountain big sagebrush, needlegrass, basin wildrye, and antelope bitterbrush.

Pachic Cryoborolls, represented by the Hapgood Family, are very deep soils on mountains. They typically are moderately coarse textured throughout. The vegetation is mainly mountain big sagebrush, needlegrass, and antelope bitterbrush.

Argic Cryoborolls, represented by the Hiridge series, are shallow soils. They typically have a moderately coarse textured surface layer and a medium to moderately fine textured subsoil, which is underlain by bedrock. The vegetation is mainly low sagebrush and needlegrass.

Of minor extent in this map unit are Andeptic Cryoborolls (Katyblay soils), Pachic Cryoborolls (the Coutis Family), and Psammentic Cryoborolls (Troutville Variant soils). Katyblay soils are very deep and are on north-facing mountain side slopes. The Coutis Family is shallow and is on mountain slopes. The vegetation on the Coutis Family soils is mainly curleaf mountainmahogany, mountain big sagebrush, and needlegrass. Troutville Variant soils are very deep and are on the highest north-facing mountain slopes. The vegetation on these soils is mainly limber pine, mountain big sagebrush, and antelope bitterbrush.

This map unit is used for rangeland and wildlife habitat.

## Broad Land Use Considerations

The soils in the survey area vary widely in their potential for major land uses, such as rangeland, woodland, crops and pasture, and wildlife habitat.

About 85 percent of the survey area is used as rangeland. Map unit 15 has the highest potential for forage production. Because this unit generally has water available and produces more palatable plants, however, there is a tendency toward overuse and range

deterioration. Map units 7, 8, and 10 are used extensively as rangeland. The primary limitation on these map units is shallowness to bedrock or a hardpan, which limits the rooting depth and the available water capacity. In extensive areas of map unit 10, slope is a further limitation.

Map units 3, 4, 5, 6, 9, and 11 also are used extensively as rangeland. The main limitation in these areas is low average annual precipitation. The slope is an additional limitation in map unit 9. Map units 1 and 2 also are used extensively as rangeland. Generally, these units have a low potential for rangeland because of limited annual precipitation. Some areas of these map units that are adjacent to playas or rivers, however, have a high potential for forage production because of added moisture from a water table.

About 14 percent of the land in the survey area is woodland. Most wooded areas are used for livestock grazing. Some, however, are used for fuel-wood cutting, Christmas tree cutting, fencepost cutting, and pine-nut gathering. On map units 12, 13, and 14, forage production is limited by shallowness to a hardpan or bedrock, which limits the rooting depth and the available water capacity. An additional limitation in large areas of map units 12 and 13 is the slope, which restricts fuel-wood cutting, Christmas tree cutting, and pine-nut gathering.

Less than 1 percent of the survey area is used as cropland or pasture. Small areas of map units 2 and 7 are used for these purposes. The main crop in these areas is alfalfa. Some areas of map units 1, 2, 3, 4, 5, 6, 7, and 8 could be used as irrigated cropland if a dependable and adequate supply of good-quality water were available. Most of the water must be pumped from wells, however, and large quantities of good-quality water are not readily available in most basins.

Almost all of the survey area is used by some kind of wildlife. The types of wildlife habitat include rangeland, wetland, and subalpine areas. Map units 1 and 2 have a good potential for wetland wildlife habitat. Because of the availability of water, food, and cover, these units are attractive to wildlife. Map units 3, 4, 5, 6, and 9 support very little wildlife, mainly because of limited precipitation.

## Detailed Soil Map Units

---

The map units on the detailed soil maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and limitations of a soil for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some included areas that belong to other taxonomic classes.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to precisely define and locate the soils and miscellaneous areas.

The detailed soil map units identified within the survey area reflect various relationships of soils with component parts of the landscape. These relationships are illustrated in figures 5 and 6. These figures indicate, in a three-dimensional representation, the soil-physiographic relationships typical of the area.

Figure 5 illustrates how some of the map unit

delineations appear throughout the various segments of the landscape. Map unit 1441 is typical of soils on the basin floor. This map unit is on an alluvial flat. Map units 1155 and 5100 are on the piedmont slope. The component landforms are fan piedmont remnant, inset fan, channel, and fan skirt. The delineations of map units 1241 and 4170 are characteristic of soils on hills and mountains.

Each map unit has one or more major soils or miscellaneous areas. Figure 6 illustrates the physiographic positions of the major components in a few typical map units. Soils on the basin floor are represented by the Slaw component of map unit 1441. These Slaw soils are on alluvial flats. Soils on the piedmont slope include map units 1155 and 5100. The Gynelle component of map unit 1155 is on fan skirts, and the Izo component is in channels. The Oricto component of map unit 5100 is on fan piedmont remnants, the Gynelle component is on inset fan remnants, and the Izo component is in channels. Soils on hills and mountains include map units 4170 and 1241. The Downeyville component of map unit 4170 is on the crests and shoulder slopes of hills, and the Blacktop component is on the back slopes of hills. The Blacktop component of map unit 1241 is on the side slopes of mountains, and the Rock outcrop component occurs as scattered peaks and ridges.

Soils that have profiles that are almost alike make up a *soil series*. The soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of one series can differ in texture of the upper layer or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Slaw silt loam, 0 to 2 percent slopes, is a phase of the Slaw series.

Some map units are made up of two or more major

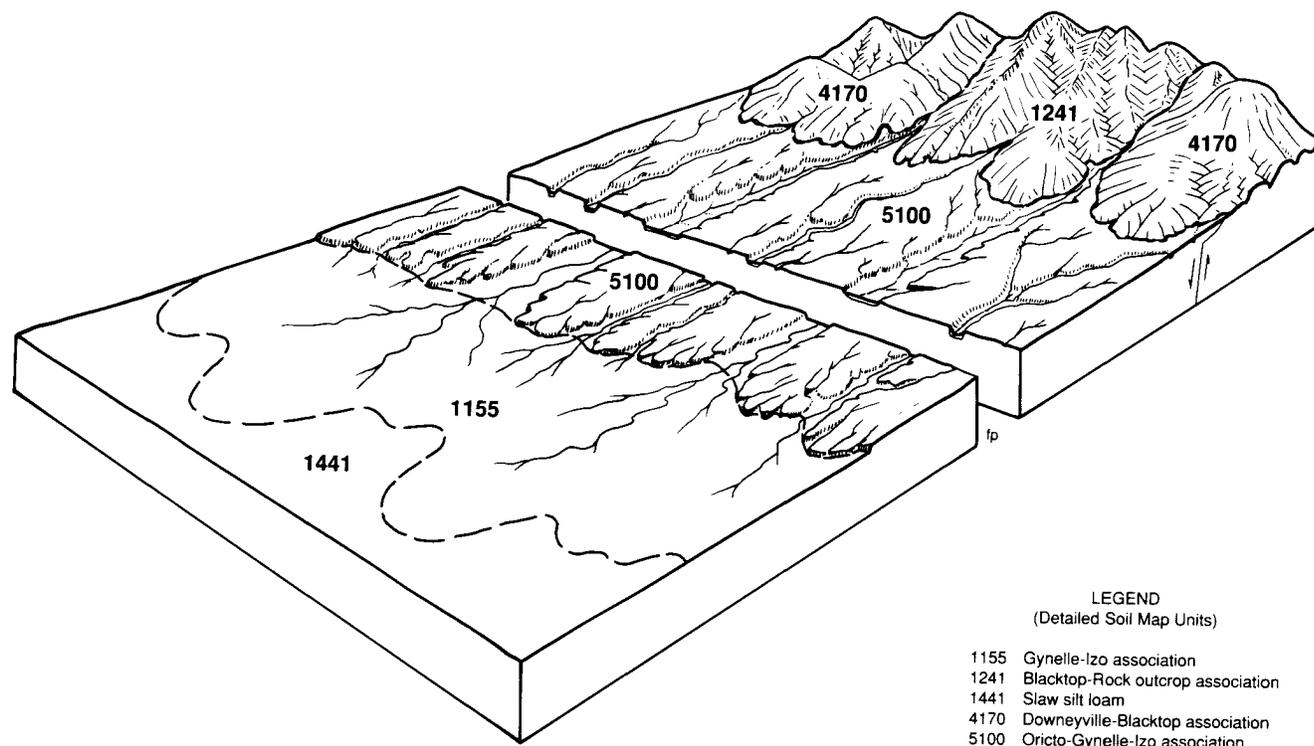


Figure 5.—Appearance of some detailed soil map units as they occur in various positions on the landscape.

soils or miscellaneous areas. These map units are called complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Fallon-Slaw complex is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Beano-Annaw association is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Playas is an example.

The detail of mapping was selected to meet the anticipated long-term use of the survey, and the map units were designed to meet the needs for that use.

Table 4 gives the acreage and proportionate extent of each map unit.

The following paragraphs explain some of the headings used in the map unit descriptions. Some of the terms used in the descriptions are defined in the Glossary. More information is given in the sections "Use and Management of the Soils" and "Soil Properties."

Map unit setting is given for the entire map unit. The setting includes landscape position, elevation, and climate. The landscape positions given in this section generally are broader than those given for each major component. The elevation and climatic data apply to the entire unit rather than the individual components.

Composition includes the components identified in the name of the map unit as well as the contrasting inclusions. Inclusions are soils or miscellaneous areas that differ from the soils or miscellaneous areas for which the unit is named. Inclusions can be either similar or contrasting. Similar inclusions are components that differ from the components for which the unit is named but that for purposes of use and management can be considered comparable to the named components. In

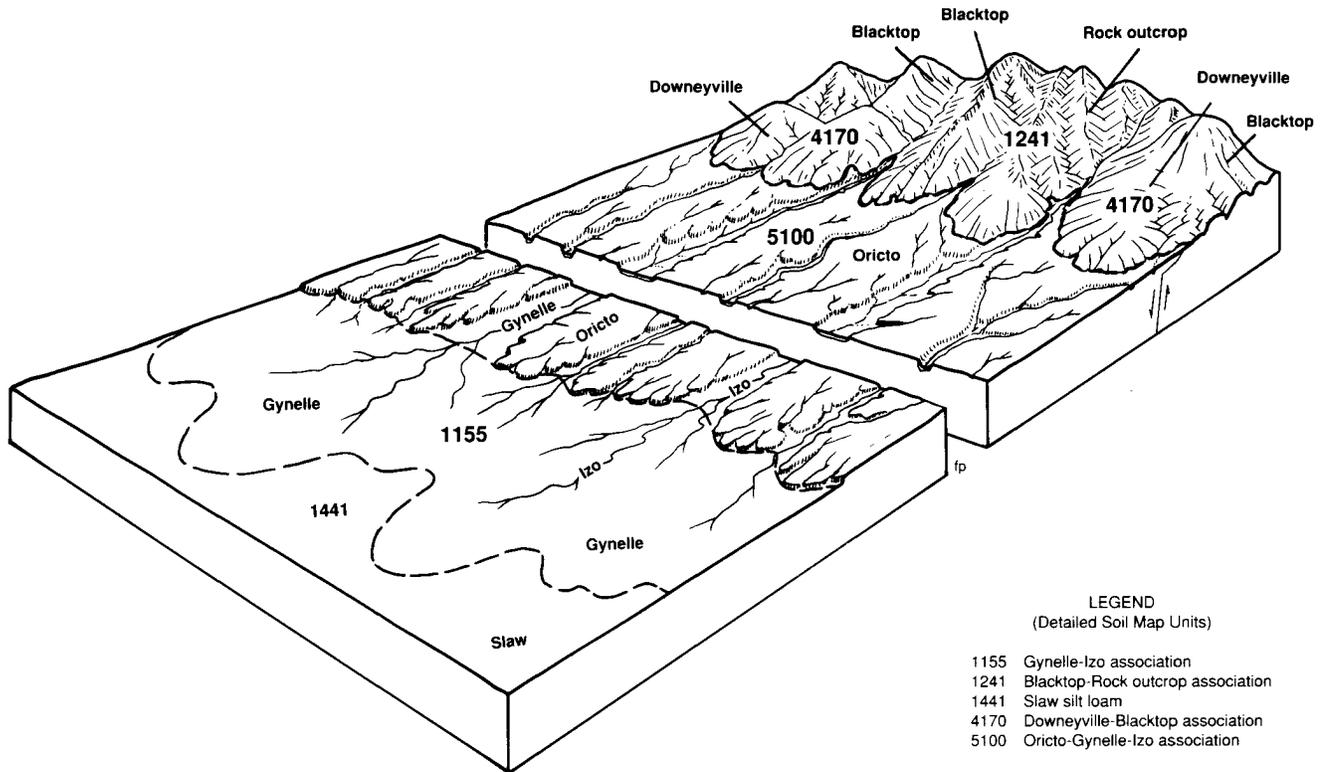


Figure 6.—Landscape positions of each major soil component identified within the respective map units.

the "Composition" section, a single percentage is provided for a named soil and the similar inclusions because their use and management are similar. Contrasting inclusions are components that differ so significantly from the components for which the unit is named that they would have different use and management if they were extensive enough to be managed separately. For most uses, contrasting inclusions have a limited effect on use and management. Inclusions generally are in small areas, and they could not be mapped separately because of the scale used. Some small areas of strongly contrasting inclusions are identified by a special symbol on the detailed soil maps. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the inclusions on the landscape.

A description of the characteristics of the soils in the map unit follows the description of the composition. The major uses, ratings for various uses, and interpretive groups also are shown.

The descriptions, names, and delineations of soils in

this soil survey do not fully agree with those in the surveys of adjacent areas. Differences are the result of a better knowledge of soils, modifications in series concepts, and variations in the intensity of mapping or in the extent of the soils within the survey areas.

### Map Unit Descriptions

#### 202—Tornillo Variant fine sandy loam, 0 to 4 percent slopes

##### Map Unit Setting

*Position on landscape:* Flood plains

*Elevation:* 5,800 to 7,300 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* 50 to 70 days

##### Composition

*Major components:*

- Tornillo Variant fine sandy loam, 0 to 4 percent slopes (Fluventic Camborthids, fine-loamy, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed, mesic—10 percent
- Inclusion 2: Xerollic Haplargids, coarse-loamy, mixed, mesic—5 percent

**Characteristics of the Tornillo Variant***Position on landscape:* Flood plains*Parent material:* Granitic and andesitic alluvium with an addition of volcanic ash*Slope features:* Length—long; shape—smooth*Dominant present vegetation:* Wyoming big sagebrush, basin wildrye, rabbitbrush**Typical Profile**

- 0 to 4 inches—fine sandy loam; moderate thick platy structure; soft, friable; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4
- 4 to 12 inches—clay loam; prismatic structure parting to angular blocky; hard, firm; mildly alkaline (pH 7.4); nonsaline; nonsodic; estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7
- 12 to 60 inches—stratified sandy clay loam to silty clay; angular blocky structure; hard, friable; moderately alkaline or strongly alkaline (pH 8.2 to 8.8); slightly saline; nonsodic; estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

**Soil and Water Features***Depth to hardpan:* More than 60 inches*Depth to bedrock:* More than 60 inches*Depth to seasonal high water table:* More than 60 inches*Frequency of flooding:* Rare*Permeability:* Moderately slow*Available water capacity:* 6 to 7 inches*Runoff:* Slow*Hydrologic group:* B*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3*Hazard of erosion:* By water—slight; by wind—moderate*Shrink-swell potential:* Moderate*Corrosivity:* Steel—high; concrete—low*Potential for frost action:* Moderate**Ratings for Various Uses***Range seeding:* Fair—too arid, excess salt**Interpretive Groups***Range site:* 027X003N**203—Toney Family, 2 to 8 percent slopes****Map Unit Setting***Position on landscape:* Fan piedmonts*Elevation:* 6,300 to 7,500 feet*Average annual precipitation:* About 12 inches*Average annual air temperature:* About 47 degrees F*Frost-free season:* 60 to 70 days**Composition***Major components:*

- Toney Family, gravelly sandy loam, 2 to 8 percent slopes (Xerollic Paleargids, fine, montmorillonitic, frigid)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Mollic Palexeralfs, fine, mixed, frigid—10 percent
- Inclusion 2: Mollic Palexeralfs, fine, mixed, frigid—5 percent

**Characteristics of the Toney Family***Position on landscape:* Fan piedmonts*Parent material:* Andesite alluvium with an addition of volcanic ash*Slope features:* Length—long; shape—smooth*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, needleandthread*Percent of surface covered by rock fragments:* 20 percent pebbles**Typical Profile**

- 0 to 6 inches—gravelly sandy loam; 25 to 50 percent pebbles (by weight); massive; soft, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 6 to 15 inches—gravelly clay; 25 percent pebbles (by weight); fine and medium angular blocky structure; hard, firm; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SC; estimated AASHTO classification—A-7
- 15 to 24 inches—gravelly clay loam; 40 percent pebbles (by weight); very fine and fine subangular blocky structure; hard, friable; neutral (pH 7.2); nonsaline; nonsodic; estimated Unified classification—SC; estimated AASHTO classification—A-7
- 24 to 56 inches—gravelly and very gravelly sandy loam; 40 to 70 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.6); slightly saline; nonsodic; estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

**Soil and Water Features**

*Depth to hardpan:* More than 60 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 4.0 to 5.5 inches  
*Runoff:* Moderate  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

**Ratings for Various Uses**

*Range seeding:* Poor—rooting depth

**Interpretive Groups**

*Range site:* 027X020N

**205—Pedee Variant sand, 2 to 15 percent slopes****Map Unit Setting**

*Position on landscape:* Fan piedmonts, mountain toe slopes  
*Elevation:* 6,400 to 7,500 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 60 days

**Composition**

*Major components:*

- Pedee Variant sand, 2 to 15 percent slopes (Mollic Palexeralfs, clayey-skeletal, mixed, frigid)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Mollic Haploxeralfs, clayey, montmorillonitic, frigid—5 percent
- Inclusion 2: Xerollic Haplargids, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Lithic Mollic Haploxeralfs, loamy, mixed, frigid—5 percent

**Characteristics of the Pedee Variant**

*Position on landscape:* Fan piedmonts, mountain toe slopes  
*Parent material:* Residuum and alluvium derived from andesite with an addition of volcanic ash  
*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, bitterbrush, Indian ricegrass

*Percent of surface covered by rock fragments:* 10 percent cobbles

**Typical Profile**

0 to 3 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 3 to 9 inches—sandy clay loam; 0 to 10 percent pebbles (by weight); massive; soft, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SC; estimated AASHTO classification—A-6  
 9 to 16 inches—gravelly clay; 30 percent pebbles (by weight); fine and medium subangular blocky structure; very hard, very firm; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—GC, SC; estimated AASHTO classification—A-7  
 16 to 29 inches—very gravelly clay; 60 percent pebbles; angular blocky structure; very hard, very firm; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—GC; estimated AASHTO classification—A-2  
 29 to 44 inches—extremely gravelly sandy clay loam; 85 percent pebbles (by weight); massive; slightly hard, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—GC, GP-GC; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to hardpan:* More than 60 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Very slow  
*Available water capacity:* 2.0 to 3.5 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

**Ratings for Various Uses**

*Range seeding:* Poor—too sandy, rooting depth

### **Interpretive Groups**

*Range site:* 026X010N

## **206—Bombadil-Acana Families association**

### **Map Unit Setting**

*Position on landscape:* Pediments, plateaus, and hill slopes

*Elevation:* 6,200 to 7,200 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Bombadil Family, very gravelly sand, 2 to 15 percent slopes (Lithic Xerollic Haplargids, loamy, mixed, mesic)—50 percent
- Acana Family, very gravelly loamy sand, 2 to 15 percent slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic—5 percent

### **Characteristics of the Bombadil Family**

*Position on landscape:* Pediments, hill slopes

*Parent material:* Andesite residuum

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Low sagebrush, ephedra, rabbitbrush, Indian ricegrass

*Percent of surface covered by rock fragments:* 70 percent pebbles

### **Typical Profile**

- 0 to 2 inches—very gravelly sand; 50 to 60 percent pebbles (by weight); single grained; loose; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—GP-GM, SP-SM, GP, SP; estimated AASHTO classification—A-1
- 2 to 6 inches—gravelly sandy loam; 25 to 40 percent pebbles (by weight); massive; soft, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2, A-4
- 6 to 9 inches—loam or clay loam; 10 to 25 percent pebbles (by weight); moderate fine subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified

classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6  
9 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 9 to 15 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 0.5 to 1.0 inch

*Runoff:* Moderate

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Acana Family**

*Position on landscape:* Pediments, plateaus, and hill slopes

*Parent material:* Material weathered from andesite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, Indian ricegrass, galleta, squirreltail, ephedra

*Percent of surface covered by rock fragments:* 90 percent pebbles

### **Typical Profile**

- 0 to 2 inches—very gravelly loamy sand; 50 to 60 percent pebbles (by weight); single grained; loose; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—GM; estimated AASHTO classification—A-1
- 2 to 6 inches—sandy loam; 10 to 20 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4
- 6 to 10 inches—gravelly clay loam; 40 to 45 percent pebbles (by weight); fine and medium angular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—GC, CL; estimated AASHTO classification—A-6, A-7
- 10 to 16 inches—fractured duripan
- 16 inches—continuous indurated duripan

**Soil and Water Features**

*Depth to hardpan:* 10 to 18 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 0.5 to 1.0 inch  
*Runoff:* Moderate  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

**Ratings of the Bombadil Family for Various Uses**

*Range seeding:* Poor—too sandy, small stones

**Ratings of the Acana Family for Various Uses**

*Range seeding:* Poor—too sandy, small stones

**Interpretive Groups**

*Range site:* Bombadil Family—027X020N; Acana Family—029X049N

**207—Bulake Family, 8 to 30 percent slopes****Map Unit Setting**

*Position on landscape:* Mountain side slopes  
*Elevation:* 6,800 to 8,000 feet  
*Average annual precipitation:* About 16 inches  
*Average annual air temperature:* About 43 degrees F  
*Frost-free season:* About 50 days

**Composition**

*Major components:*

- Bulake Family, gravelly loamy sand, 8 to 30 percent slopes (Lithic Mollic Haploxeralfs, clayey, montmorillonitic, frigid)—80 percent

*Contrasting inclusions:*

- Inclusion 1: Mollic Palexeralfs, fine, montmorillonitic, frigid—8 percent
- Inclusion 2: Calcic Haploxeralfs, fine, mixed, frigid—7 percent
- Inclusion 3: Rock outcrop—5 percent

**Characteristics of the Bulake Family**

*Position on landscape:* Mountain side slopes  
*Parent material:* Material weathered from andesite with an addition of volcanic ash  
*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, antelope bitterbrush, Indian ricegrass

*Percent of surface covered by rock fragments:* 40 percent pebbles, 10 percent cobbles

**Typical Profile**

0 to 4 inches—gravelly loamy sand; 25 to 40 percent pebbles (by weight); single grained; loose; neutral (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 17 inches—clay; 10 to 25 percent pebbles (by weight); moderate prismatic structure parting to angular blocky; very hard, very firm; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—CH, CL; estimated AASHTO classification—A-7

17 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 9 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 1.5 to 2.5 inches  
*Runoff:* Moderate  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—2  
*Hazard of erosion:* By water—moderate; by wind—moderate  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

**Ratings for Various Uses**

*Range seeding:* Poor—too sandy, rooting depth

**Interpretive Groups**

*Range site:* 026X062N

*Woodland ordination symbol:* 1C

**208—Bregar Family, 2 to 15 percent slopes****Map Unit Setting**

*Position on landscape:* Pediments, mountain side slopes  
*Elevation:* 6,800 to 7,400 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 70 days

## Composition

### Major components:

- Bregar Family, very gravelly sand, 2 to 15 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, frigid)—75 percent

### Contrasting inclusions:

- Inclusion 1: Xerollic Durorthids, loamy-skeletal, mixed, frigid—10 percent
- Inclusion 2: Xeric Torriorthents, ashy-skeletal, mixed, nonacid, frigid—10 percent
- Inclusion 3: Rock outcrop—3 percent
- Inclusion 4: Xerollic Haplargids—2 percent

### Characteristics of the Bregar Family

*Position on landscape:* Pediments, mountain side slopes

*Parent material:* Material weathered from andesite

*Slope features:* Length—short; shape—rolling

*Dominant present vegetation:* Utah juniper, rabbitbrush, Wyoming big sagebrush

*Percent of surface covered by rock fragments:* 35 percent pebbles, 15 percent cobbles

### Typical Profile

- 0 to 2 inches—very gravelly sand; 45 to 55 percent pebbles. 10 to 15 percent cobbles (by weight); single grained; loose; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1
- 2 to 5 inches—sandy loam; 5 to 10 percent pebbles (by weight); massive; soft, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4
- 5 to 8 inches—very gravelly loam or very gravelly clay loam; 50 to 60 percent pebbles (by weight); weak subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—GC; estimated AASHTO classification—A-2
- 8 inches—unweathered bedrock

### Soil and Water Features

- Depth to bedrock:* 8 to 16 inches
- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* None
- Permeability:* Moderately slow
- Available water capacity:* 0.5 to 1.0 inch
- Runoff:* Moderate
- Hydrologic group:* D
- Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—2
- Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Ratings for Various Uses

*Range seeding:* Poor—too sandy, small stones

### Interpretive Groups

*Range site:* 026X063N

## 211—Langston-Karpp Families association

### Map Unit Setting

*Position on landscape:* Lake terraces and fan piedmonts

*Elevation:* 6,800 to 7,200 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 70 days

### Composition

#### Major components:

- Langston Family, loamy sand, 0 to 4 percent slopes (Xerollic Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—60 percent
- Karpp Family, very gravelly sandy loam, 0 to 8 percent slopes (Xerollic Durorthids, loamy-skeletal, mixed, mesic, shallow)—20 percent

#### Contrasting inclusions:

- Inclusion 1: Xeric Torriorthents, ashy-skeletal, mixed, nonacid, mesic—10 percent
- Inclusion 2: Xerollic Haplargids, fine-loamy, mixed, mesic—5 percent
- Inclusion 3: Durixerollic Haplargids, coarse-loamy, mixed, mesic—5 percent

### Characteristics of the Langston Family

*Position on landscape:* Fan piedmonts

*Parent material:* Andesite

*Slope features:* Length—long; shape—rolling

*Dominant present vegetation:* Wyoming big sagebrush, phlox, rabbitbrush

### Typical Profile

- 0 to 4 inches—loamy sand; single grained; loose; mildly alkaline (pH 7.6); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
- 4 to 9 inches—sandy loam; massive; soft, friable; moderately alkaline (pH 8.4); slightly saline; nonsodic; estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-4
- 9 to 14 inches—sandy clay loam; strong angular blocky

structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline; nonsodic; estimated Unified classification—CL; estimated AASHTO classification—A-6

14 to 40 inches—very gravelly sand; 50 to 70 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.8); nonsaline; nonsodic; estimated Unified classification—GP-GM, SP-SM; estimated AASHTO classification—A-1

40 to 50 inches—loamy sand; 0 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2, A-4

### Soil and Water Features

*Depth to hardpan:* More than 60 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* 2.0 to 3.5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Karpp Family

*Position on landscape:* Beach terraces and fan piedmonts  
*Parent material:* Alluvium derived from andesite with an addition of volcanic ash  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Juniper, Wyoming big sagebrush, rabbitbrush

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 50 to 75 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.8); nonsaline; nonsodic; estimated Unified classification—GM; estimated AASHTO classification—A-1  
 2 to 9 inches—extremely gravelly sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, friable; strongly alkaline (pH 8.8); nonsaline; nonsodic; estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1  
 9 inches—indurated duripan

### Soil and Water Features

*Depth to hardpan:* 8 to 16 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 1.0 inch to 1.5 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Ratings of the Langston Family for Various Uses

*Range seeding:* Poor—too sandy

### Ratings of the Karpp Family for Various Uses

*Range seeding:* Poor—too sandy, small stones

### Interpretive Groups

*Range site:* Langston Family—029X049N; Karpp Family—026X063N  
*Woodland ordination symbol:* Karpp Family—1D

## 213—Ratto-Vinini Families association

### Map Unit Setting

*Position on landscape:* Summits of fan piedmonts and pediments  
*Elevation:* 6,200 to 7,200 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 70 days

### Composition

*Major components:*

- Ratto Family, gravelly sand, 2 to 15 percent slopes (Xerollic Durargids, clayey, montmorillonitic, frigid, shallow)—50 percent
  - Vinini Family, very gravelly sand, 2 to 15 percent slopes (Xerollic Durargids, loamy-skeletal, mixed, frigid, shallow)—35 percent
- Contrasting inclusions:*
- Inclusion 1: Lithic Mollic Haploxeralfs, clayey, montmorillonitic, frigid—5 percent
  - Inclusion 2: Xerollic Haplargids, fine-loamy, mixed, frigid—5 percent
  - Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, frigid—5 percent

### **Characteristics of the Ratto Family**

*Position on landscape:* Summits of fan piedmonts and plateaus

*Parent material:* Alluvium, colluvium, and residuum derived from mixed rock sources

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Low sagebrush, ephedra, Indian ricegrass, galleta

#### **Typical Profile**

0 to 3 inches—gravelly sand; 25 to 50 percent pebbles, 0 to 10 percent cobbles (by weight); single grained; loose; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

3 to 18 inches—clay; 0 to 20 percent pebbles (by weight); strong angular blocky structure; hard, firm; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

18 inches—indurated duripan

#### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2.0 to 2.5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Vinini Family**

*Position on landscape:* Summits of fan piedmonts and plateaus

*Parent material:* Alluvium, colluvium, and residuum derived from mixed rock sources

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Low sagebrush, Utah juniper, singleleaf pinyon, antelope bitterbrush

#### **Typical Profile**

0 to 1 inch—very gravelly sand; 55 to 65 percent

pebbles (by weight); single grained; loose; mildly alkaline (pH 7.4); nonsaline; nonsodic; estimated Unified classification—GP-GM, SP-SM; estimated AASHTO classification—A-1

1 to 3 inches—clay loam; 0 to 20 percent pebbles (by weight); moderate angular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline; nonsodic; estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

3 to 15 inches—very gravelly clay loam; 50 to 70 percent pebble-sized pan fragments (by weight); moderate subangular blocky structure; hard, friable; moderately alkaline (pH 8.0); nonsaline; nonsodic; estimated Unified classification—GC; estimated AASHTO classification, A-2, A-6, A-7

15 to 19 inches—very gravelly sandy loam; 50 to 75 percent pebble-sized pan fragments (by weight); weak subangular blocky structure; moderately alkaline (pH 8.2); nonsaline; nonsodic; estimated Unified classification—GM; estimated AASHTO classification—A-1

19 to 22 inches—indurated duripan

#### **Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* 1.0 inch to 1.5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—2

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### **Ratings of the Ratto Family for Various Uses**

*Range seeding:* Poor—too sandy, droughty

#### **Ratings of the Vinini Family for Various Uses**

*Range seeding:* Poor—too sandy, small stones

#### **Interpretive Groups**

*Range site:* Ratto Family—026X064N; Vinini Family—026X064N

*Woodland ordination symbol:* Vinini Family—1D

## 214—Watoopah Family, 2 to 8 percent slopes

### Map Unit Setting

*Position on landscape:* Fan piedmonts and beach terraces

*Elevation:* 6,800 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 80 days

### Composition

*Major components:*

- Watoopah Family, loamy sand, 2 to 8 percent slopes (Durixerollic Haplargids, coarse-loamy, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, loamy-skeletal, mixed, mesic—8 percent
- Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic—5 percent
- Inclusion 3: Xeric Torriorthents, coarse-loamy, mixed, nonacid, mesic—2 percent

### Characteristics of the Watoopah Family

*Position on landscape:* Fan piedmonts and beach terraces

*Parent material:* Alluvium and colluvium derived from volcanic rock sources and ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, Indian ricegrass, phlox, squirreltail

### Typical Profile

- 0 to 2 inches—loamy sand; single grained; loose; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-2
- 2 to 8 inches—fine sandy loam; massive; soft, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4
- 8 to 13 inches—cobble sandy loam; 25 to 45 percent cobbles (by weight); moderate subangular blocky structure; slightly hard, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2
- 13 to 20 inches—gravelly sandy clay loam; 30 to 45 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline; nonsodic; estimated Unified classification—SC, CL; estimated AASHTO classification—A-6, A-7

20 to 44 inches—stratified gravelly loamy sand to very gravelly sand; 50 to 60 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8 to 9.0); nonsaline; nonsodic; estimated Unified classification—GM, GP-GM, SM, SP-SM; estimated AASHTO classification—A-1

44 inches—indurated duripan

### Soil and Water Features

*Depth to hardpan:* 40 to 60 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 3 to 4 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—3; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Ratings for Various Uses

*Range seeding:* Fair—too sandy

### Interpretive Groups

*Range site:* 029X049N

## 216—Merino Family, 30 to 50 percent slopes

### Map Unit Setting

*Position on landscape:* Mountain side slopes

*Elevation:* 8,400 to 9,500 feet

*Average annual precipitation:* About 20 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 40 days

### Composition

*Major components:*

- Merino Family, extremely gravelly coarse sand, 30 to 50 percent slopes (Lithic Cryorthents, loamy-skeletal, mixed, nonacid)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Mollic Cryoboralfs, fine, mixed—8 percent
- Inclusion 2: Pachic Cryoborolls, loamy-skeletal, mixed—5 percent
- Inclusion 3: Rock outcrop—2 percent

### Characteristics of the Merino Family

*Position on landscape:* Mountain side slopes

*Parent material:* Residuum and colluvium derived from andesite

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Low sagebrush, spike fescue, skeletonweed, lupine, rabbitbrush

*Percent of surface covered by rock fragments:* 7 percent pebbles

### Typical Profile

0 to 2 inches—extremely gravelly coarse sand; 75 to 85 percent pebbles (by weight); single grained; loose; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—GP; estimated AASHTO classification—A-1

2 to 5 inches—sandy loam; 10 to 20 percent pebbles (by weight); massive; soft, very friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4

5 to 12 inches—extremely gravelly sandy loam; 90 to 95 percent pebbles (by weight); massive; soft, friable; slightly acid (pH 6.6); nonsaline; nonsodic; estimated Unified classification—GP-GC; estimated AASHTO classification—A-2

12 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 16 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 0.5 inch to 1.5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Ratings for Various Uses

*Range seeding:* Poor—too sandy, small stones

### Interpretive Groups

*Range site:* 026X028N

## 218—Ratto-Borealis Families association

### Map Unit Setting

*Position on landscape:* Fan piedmonts, plateaus, and mountain side slopes

*Elevation:* 6,200 to 8,300 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 70 days

### Composition

*Major components:*

- Ratto Family, gravelly sand, 2 to 15 percent slopes (Xerollic Durargids, clayey, montmorillonitic, frigid, shallow)—70 percent

- Borealis Family, very cobbly sandy loam, 4 to 30 percent slopes (Abruptic Durixeralfs, fine, mixed, frigid)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Mollic Haploxeralfs, clayey, mixed, frigid—8 percent

- Inclusion 2: Lithic Mollic Haploxeralfs, fine-loamy, mixed, frigid—5 percent

- Inclusion 3: Rock outcrop—2 percent

### Characteristics of the Ratto Family

*Position on landscape:* Fan piedmonts and plateaus

*Parent material:* Alluvium, colluvium, and residuum derived from mixed rock sources

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Low sagebrush, ephedra, Indian ricegrass

### Typical Profile

0 to 3 inches—gravelly sand; 25 to 50 percent pebbles, 0 to 10 percent cobbles (by weight); single grained; loose; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

3 to 18 inches—clay; 0 to 20 percent pebbles (by weight); strong angular blocky structure; hard, firm; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

18 to 26 inches—indurated duripan

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* 2.0 to 2.5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Borealis Family**

*Position on landscape:* Fan piedmonts, pediments, and mountain side slopes

*Parent material:* Andesite, volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, antelope bitterbrush, singleleaf pinyon, squirreltail, rabbitbrush

*Percent of surface covered by rock fragments:* 10 percent pebbles, 20 percent cobbles

### **Typical Profile**

0 to 2 inches—very cobbly sandy loam; 45 to 60 percent cobbles (by weight); massive; soft, very friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4

2 to 8 inches—gravelly sandy loam; 30 to 50 percent pebbles (by weight); massive; soft, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2, A-4

8 to 20 inches—clay; 10 to 20 percent pebbles (by weight); prismatic structure parting to angular blocky; very hard, firm; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—CH, CL; estimated AASHTO classification—A-7

20 to 24 inches—indurated duripan

24 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to bedrock:* 24 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 2 to 3 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—2; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Ratings of the Ratto Family for Various Uses**

*Range seeding:* Poor—too sandy, droughty

### **Ratings of the Borealis Family for Various Uses**

*Range seeding:* Fair—large stones, rooting depth

### **Interpretive Groups**

*Range site:* Ratto Family—027X049N; Borealis Family—026X060N

*Woodland ordination symbol:* Borealis Family—1C

## **301—Lazan Family-Powment association**

### **Map Unit Setting**

*Position on landscape:* Mountain side slopes

*Elevation:* 6,400 to 7,800 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Lazan Family, gravelly sand, 50 to 75 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—50 percent

- Powment very gravelly sand, 50 to 75 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, frigid, shallow)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Entic Haploxerolls, sandy-skeletal, mixed, frigid, shallow—10 percent

### **Characteristics of the Lazan Family**

*Position on landscape:* South-facing mountain side slopes

*Parent material:* Colluvium and residuum derived from granitic rocks

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, antelope bitterbrush, desert needlegrass, Wyoming big sagebrush

*Percent of surface covered by rock fragments:* 20 percent pebbles

### **Typical Profile**

0 to 2 inches—gravelly sand; 30 to 50 percent pebbles (by weight); single grained; loose; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 4 inches—very gravelly sand; 50 to 75 percent

pebbles (by weight); single grained; loose; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1  
 4 to 23 inches—highly weathered granitic bedrock  
 23 inches—hard granitic bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 16 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Rapid  
*Available water capacity:* 0.2 to 1.0 inch  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—2  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

#### Characteristics of the Powment Soil

*Position on landscape:* North-facing mountain side slopes  
*Parent material:* Colluvium and residuum derived from granitic rocks  
*Slope features:* Length—long; shape—concave to convex  
*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Indian ricegrass, mountain big sagebrush, antelope bitterbrush  
*Percent of surface covered by rock fragments:* 70 percent cobbles

#### Typical Profile

0 to 2 inches—very gravelly sand; 65 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SP-SM; estimated AASHTO classification—A-1  
 2 to 10 inches—extremely gravelly sand; 90 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SP; estimated AASHTO classification—A-1  
 10 inches—highly weathered and fractured granitic bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* 0.1 to 0.7 inch  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

#### Ratings of the Lazan Family for Various Uses

*Range seeding:* Poor—droughty, too sandy, erodes easily

#### Ratings of the Powment Soil for Various Uses

*Range seeding:* Poor—droughty, too sandy, small stones

#### Interpretive Groups

*Range site:* Lazan Family—026X061N; Powment soil—026X060N  
*Woodland ordination symbol:* Lazan Family—1R; Powment soil—1R

### 302—Jenness Family, 0 to 4 percent slopes

#### Map Unit Setting

*Position on landscape:* Alluvial fans and broad drainageways  
*Elevation:* 6,600 to 7,600 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 47 degrees F  
*Frost-free season:* About 80 days

#### Composition

##### Major components:

- Jenness Family, sandy loam, 0 to 4 percent slopes (Xeric Torriorthents, coarse-loamy, mixed, nonacid, mesic)—75 percent

##### Contrasting inclusions:

- Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed, mesic—10 percent
- Inclusion 2: Durixerollic Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic—10 percent
- Inclusion 3: Durixerollic Camborthids, loamy-skeletal, mixed, mesic—5 percent

#### Characteristics of the Jenness Family

*Position on landscape:* Alluvial fans and broad drainageways

*Parent material:* Alluvium derived from mixed rock sources and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread

### Typical Profile

0 to 37 inches—sandy loam; massive; soft, friable; neutral (pH 6.6 to 6.8); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4

37 to 60 inches—loamy very fine sand; massive; soft, friable; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to hardpan:* More than 60 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 5 to 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Ratings for Various Uses

*Range seeding:* Fair—too arid

### Interpretive Groups

*Range site:* 029X049N

## 304—Reese Family-Tornillo Variant-Kawich Family association

### Map Unit Setting

*Position on landscape:* Flood plains and sand dunes

*Elevation:* 6,800 to 7,200 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 80 days

### Composition

*Major components:*

- Reese Family, loamy sand, 0 to 2 percent slopes

(Aeric Halaquepts, fine-loamy, mixed [calcareous], mesic)—60 percent

- Tornillo Variant silty clay loam, 0 to 4 percent slopes (Fluventic Camborthids, fine-loamy, mixed, mesic)—15 percent

- Kawich Family, fine sand, 4 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed, mesic—5 percent

- Inclusion 2: Xerollic Camborthids, sandy-skeletal, mixed, mesic—3 percent

- Inclusion 3: Xeric Torriorthents, coarse-loamy, mixed, nonacid, mesic—2 percent

### Characteristics of the Reese Family

*Position on landscape:* Flood plains

*Parent material:* Mixed alluvium derived from granite, andesite, and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Inland saltgrass, rabbitbrush, black greasewood

### Typical Profile

0 to 9 inches—loamy sand; massive; very soft, very friable; strongly alkaline or very strongly alkaline (pH 8.8 to 9.6); nonsaline; strongly sodic; estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

9 to 60 inches—stratified loamy sand to silty clay loam; platy or massive; hard, friable; very strongly alkaline (pH 9.6); slightly to moderately saline; moderately sodic; estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to hardpan:* More than 60 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 2 to 3 feet (January through August)

*Frequency of flooding:* Occasional (February through April)

*Permeability:* Slow

*Available water capacity:* 5 to 6 inches

*Runoff:* Ponded

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* High

### **Characteristics of the Tornillo Variant**

*Position on landscape:* Flood plains

*Parent material:* Alluvium derived from granite, andesite, and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, basin wildrye, rabbitbrush, black greasewood

#### **Typical Profile**

0 to 17 inches—silty clay loam; platy structure; hard, friable; moderately alkaline (pH 8.4); slightly saline; nonsodic; estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

17 to 22 inches—very fine sandy loam; massive; soft, friable; strongly alkaline (pH 8.8); slightly to moderately saline; slightly sodic; estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

22 to 32 inches—silty clay loam; angular blocky structure; very hard, friable; very strongly alkaline (pH 9.6); slightly to moderately saline; moderately sodic; estimated Unified classification—ML; estimated AASHTO classification—A-6, A-7

32 to 60 inches—stratified very fine sandy loam to sand; massive; soft, friable; very strongly alkaline (pH 9.6); slightly to moderately saline; moderately sodic; estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4, A-2

#### **Soil and Water Features**

*Depth to hardpan:* More than 60 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 6 to 9 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Moderate

### **Characteristics of the Kawich Family**

*Position on landscape:* Sand dunes

*Parent material:* Mixed alluvium

*Slope features:* Hummocky

*Dominant present vegetation:* Black greasewood, rabbitbrush, needleandthread

#### **Typical Profile**

0 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline; slightly sodic; estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

#### **Soil and Water Features**

*Depth to hardpan:* More than 60 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* 3 to 4 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Ratings of the Reese Family for Various Uses**

*Range seeding:* Poor—too sandy, excess salt

#### **Ratings of the Tornillo Variant for Various Uses**

*Range seeding:* Poor—too arid, excess salt

#### **Ratings of the Kawich Family for Various Uses**

*Range seeding:* Poor—too arid, too sandy, soil blowing

#### **Interpretive Groups**

*Range site:* Reese Family—027X025N; Tornillo Variant—027X003N; Kawich Family—027X016N

## **305—Sheeprock Family, 4 to 30 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Alluvial fans

*Elevation:* 6,400 to 7,800 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 80 days

#### **Composition**

*Major components:*

- Sheeprock Family, gravelly sandy loam, 4 to 30 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, coarse-loamy, mixed, nonacid, mesic—10 percent

- Inclusion 2: Xeric Torriorthents, sandy, mixed, mesic—5 percent

### **Characteristics of the Sheeprock Family**

*Position on landscape:* Alluvial fans

*Parent material:* Granitic alluvium with an addition of volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass, squirreltail, needleandthread, cheatgrass

### **Typical Profile**

0 to 6 inches—gravelly sandy loam; 25 to 40 percent pebbles (by weight); massive; very soft, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2, A-4

6 to 55 inches—very gravelly loamy sand; 50 to 65 percent pebbles (by weight); single grained; loose; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* More than 60 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* 7.5 to 9.5 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Ratings for Various Uses**

*Range seeding:* Fair—too arid, droughty

### **Interpretive Groups**

*Range site:* 029X049N

## **306—Baldy Variant silt loam, 0 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 8,500 to 9,000 feet

*Average annual precipitation:* About 18 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 40 days

### **Composition**

*Major components:*

- Baldy Variant silt loam, 0 to 4 percent slopes (Typic Cryorthents, fine-silty, mixed, nonacid)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Pachic Cryoborolls, loamy-skeletal, mixed—7 percent
- Inclusion 2: Pachic Cryoborolls, coarse-loamy—3 percent

### **Characteristics of the Baldy Variant**

*Position on landscape:* Flood plains

*Parent material:* Mixed alluvium derived from granite, andesite, and volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Silver sagebrush, needlegrass, mat muhly, sedge, lupine

### **Typical Profile**

0 to 24 inches—silt loam; massive; soft, friable; slightly acid to neutral (pH 6.4 to 6.6); nonsaline; nonsodic; estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

24 to 32 inches—silty clay loam; massive; very soft, very friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—CL, ML; estimated AASHTO classification—A-7

32 to 44 inches—very fine sandy loam; massive; soft, very friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—CL-ML, SM-SC; estimated AASHTO classification—A-4

44 to 56 inches—very gravelly sand; 50 to 70 percent pebbles; massive; soft, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* More than 60 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 48 to 72 inches (February through July)

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* 7.5 to 9.5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### **Ratings for Various Uses**

*Range seeding:* Poor—too arid

#### **Interpretive Groups**

*Range site:* 026X049N

### **307—Jenness Family-Fadoll association**

#### **Map Unit Setting**

*Position on landscape:* Alluvial fans and broad drainageways  
*Elevation:* 6,600 to 7,600 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* 60 to 90 days

#### **Composition**

*Major components:*

- Jenness Family, sandy loam, 0 to 4 percent slopes (Xeric Torriorthents, coarse-loamy, mixed, nonacid, mesic)—45 percent
  - Fadoll gravelly loamy sand, 0 to 4 percent slopes (Xeric Torriorthents, ashy, nonacid, mesic)—35 percent
- Contrasting inclusions:*
- Inclusion 1: Abruptic Durixeralfs, fine, mixed, mesic—10 percent
  - Inclusion 2: Xerollic Durargids, clayey, mixed, mesic, shallow—5 percent
  - Inclusion 3: Lithic Mollic Haploxeralfs, clayey, mixed, mesic—5 percent

#### **Characteristics of the Jenness Family**

*Position on landscape:* Alluvial fans and broad drainageways  
*Parent material:* Alluvium derived from mixed rock sources and volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, Indian ricegrass, needleandthread

#### **Typical Profile**

0 to 37 inches—sandy loam; massive; soft, friable; neutral (pH 6.6 to 6.8); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4

37 to 60 inches—loamy very fine sand; massive; soft, friable; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4

#### **Soil and Water Features**

*Depth to hardpan:* More than 60 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* 5 to 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### **Characteristics of the Fadoll Soil**

*Position on landscape:* Inset fans  
*Parent material:* Volcanic ash and alluvium derived from mixed rock sources  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Indian ricegrass, needleandthread, bottlebrush squirreltail, Wyoming big sagebrush

#### **Typical Profile**

0 to 10 inches—gravelly loamy sand; 20 percent pebbles; single grained; loose; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SM, GM; estimated AASHTO classification—A-1  
 10 to 35 inches—loamy sand; massive; very hard, friable; neutral (pH 6.8); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-2  
 35 to 60 inches—very gravelly sand; 60 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline; nonsodic; estimated Unified classification—SP-SM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* More than 60 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid

*Available water capacity:* 5.0 to 7.5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

#### **Ratings of the Jenness Family for Various Uses**

*Range seeding:* Fair—too arid

#### **Ratings of the Fadoll Soil for Various Uses**

*Range seeding:* Poor—too sandy

#### **Interpretive Groups**

*Range site:* Jenness Family—029X049N; Fadoll soil—029X049N

### **502—Hapgood Family, 4 to 15 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Mountain side slopes  
*Elevation:* 8,400 to 9,500 feet  
*Average annual precipitation:* About 18 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 40 days

#### **Composition**

*Major components:*

- Hapgood Family, very cobbly sandy loam, 4 to 15 percent slopes (Pachic Cryoborolls, loamy-skeletal, mixed)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Cryorthents, coarse-loamy, mixed, nonacid—5 percent
- Inclusion 2: Pachic Cryoborolls, coarse-loamy, mixed—5 percent

#### **Characteristics of the Hapgood Family**

*Position on landscape:* Mountain side slopes  
*Parent material:* Andesite  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Mountain big sagebrush, bitterbrush, snowberry, needlegrass, eriogonum  
*Percent of surface covered by rock fragments:* 60 percent cobbles

#### **Typical Profile**

0 to 5 inches—very cobbly sandy loam; 50 to 65 percent cobbles (by weight); massive; very soft,

very friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2, A-4  
 5 to 40 inches—very cobbly sandy loam; 50 to 65 percent cobbles (by weight); massive; soft, very friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2, A-4

#### **Soil and Water Features**

*Depth to bedrock:* 40 to 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* 2.0 to 3.5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—3; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### **Ratings for Various Uses**

*Range seeding:* Poor—large stones

#### **Interpretive Groups**

*Range site:* 026X038N

### **504—Coutis Family, 15 to 50 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Mountain side slopes  
*Elevation:* 8,400 to 9,400 feet  
*Average annual precipitation:* About 18 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 40 days

#### **Composition**

*Major components:*

- Coutis Family, sandy loam, 15 to 50 percent slopes (Pachic Cryoborolls, coarse-loamy, mixed)—75 percent

*Contrasting inclusions:*

- Inclusion 1: Argic Lithic Cryoborolls, loamy-skeletal, mixed—10 percent
- Inclusion 2: Pachic Cryoborolls, loamy-skeletal, mixed—10 percent
- Inclusion 3: Rock outcrop—5 percent

#### **Characteristics of the Coutis Family**

*Position on landscape:* Mountain side slopes

*Parent material:* Granitic residuum

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Mountain big sagebrush, antelope bitterbrush, needlegrass, snowberry, bluegrass, lupine

*Percent of surface covered by rock fragments:* 10 percent pebbles

### Typical Profile

0 to 29 inches—sandy loam; 5 to 15 percent pebbles (by weight); massive; soft, very friable; slightly acid (pH 6.2 to 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4

29 to 43 inches—very gravelly sandy loam; 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.7); nonsaline; nonsodic; estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

43 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 24 to 50 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 4 to 5 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—3; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Ratings for Various Uses

*Range seeding:* Poor—erodes easily

### Interpretive Groups

*Range site:* 026X009N

## 505—Madeline-Bulake Families association

### Map Unit Setting

*Position on landscape:* Mountain side slopes

*Elevation:* 6,800 to 8,000 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 50 days

### Composition

#### Major components:

- Madeline Family, gravelly sandy loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey, montmorillonitic, frigid)—60 percent
- Bulake Family, cobbly very fine sandy loam, 15 to 50 percent slopes (Lithic Mollic Haploxeralfs, clayey, montmorillonitic, frigid)—25 percent

#### Contrasting inclusions:

- Inclusion 1: Typic Argixerolls, loamy-skeletal, mixed, frigid—8 percent
- Inclusion 2: Lithic Argixerolls, loamy-skeletal, mixed, frigid—5 percent
- Inclusion 3: Rock outcrop—2 percent

### Characteristics of the Madeline Family

*Position on landscape:* Mountain side slopes

*Parent material:* Alluvium, colluvium, and residuum derived from volcanic rocks and ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Sandberg bluegrass, antelope bitterbrush

### Typical Profile

0 to 2 inches—gravelly sandy loam; 25 to 40 percent pebbles, 0 to 5 percent cobbles (by weight); massive; soft, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

2 to 5 inches—clay loam; 10 to 20 percent pebbles (by weight); massive; slightly hard, friable; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—CL; estimated AASHTO classification—A-6, A-7

5 to 10 inches—clay; 10 to 20 percent pebbles (by weight); prismatic structure parting to angular blocky; very hard, very firm; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—CH; estimated AASHTO classification—A-7

10 inches—bedrock; weathered in the upper 6 inches

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* 1.2 to 2.0 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Bulake Family**

*Position on landscape:* Mountain side slopes  
*Parent material:* Andesite, volcanic ash  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Singleleaf pinyon, low sagebrush, antelope bitterbrush, Indian ricegrass  
*Percent of surface covered by rock fragments:* 40 percent pebbles, 10 percent cobbles

### **Typical Profile**

0 to 4 inches—cobbly very fine sandy loam; 20 to 30 percent pebbles, 25 to 35 percent cobbles (by weight); massive; slightly hard, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4  
 4 to 17 inches—clay; 5 to 10 percent pebbles (by weight); moderate prismatic structure parting to angular blocky; very hard, very firm; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—CH, CL; estimated AASHTO classification—A-7  
 17 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 9 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* 1.5 to 2.5 inches  
*Runoff:* Moderate  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—moderate  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Ratings of the Madeline Family for Various Uses**

*Range seeding:* Poor—droughty

### **Ratings of the Bulake Family for Various Uses**

*Range seeding:* Poor—droughty

### **Interpretive Groups**

*Range site:* Madeline Family—026X060N; Bulake Family—026X064N  
*Woodland ordination symbol:* Madeline Family—1R; Bulake Family—1R

## **507—Clanalpine Family, 15 to 50 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Mountain side slopes  
*Elevation:* 6,500 to 7,800 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 70 days

### **Composition**

*Major components:*

- Clanalpine Family, very cobbly very fine sandy loam, 15 to 50 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid)—75 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Mollic Haploxeralfs, clayey, montmorillonitic, frigid—10 percent
- Inclusion 2: Xerollic Durargids, clayey-skeletal, mixed, frigid—5 percent
- Inclusion 3: Abruptic Durixeralfs, fine, mixed, frigid—5 percent
- Inclusion 4: Pachic Cryoborolls, loamy-skeletal, mixed—5 percent

### **Characteristics of the Clanalpine Family**

*Position on landscape:* Mountain side slopes  
*Parent material:* Alluvium and residuum derived from volcanic rocks  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, antelope bitterbrush, bluegrass, prairie junegrass  
*Percent of surface covered by rock fragments:* 60 percent cobbles

### **Typical Profile**

0 to 3 inches—very cobbly very fine sandy loam; 50 to 70 percent cobbles (by weight); massive; soft, very friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-4  
 3 to 8 inches—cobbly loam; 5 to 15 percent pebbles, 15 to 30 percent cobbles (by weight); subangular

blocky structure; soft, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

8 to 15 inches—very cobbly clay loam; 50 to 60 percent cobbles (by weight); subangular blocky structure; soft, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—CL; estimated AASHTO classification—A-6

15 to 40 inches—extremely cobbly loam; 70 to 80 percent cobbles (by weight); massive; soft, friable; slightly acid (pH 6.4); nonsaline; nonsodic; estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to hardpan:* More than 60 inches

*Depth to bedrock:* 40 to 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* 2 to 4 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—4; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Ratings for Various Uses

*Range seeding:* Poor—large stones

### Interpretive Groups

*Range site:* 026X060N

*Woodland ordination symbol:* 1R

## 902—Lava flows-Lithic Xerorthents complex, 2 to 8 percent slopes

### Map Unit Setting

*Position on landscape:* Lava-flow areas

*Elevation:* 7,000 to 7,500 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 80 days

### Composition

*Major components:*

- Lava flows—60 percent
- Lithic Xerorthents, 2 to 15 percent slopes—25 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Xerorthents—10 percent
- Inclusion 2: Rock outcrop—5 percent

### Characteristics of the Lithic Xerorthents

*Position on landscape:* Lava-flow areas

*Parent material:* Volcanic ash

*Slope features:* Length—short; shape—rolling

*Dominant present vegetation:* Singleleaf pinyon, bitterbrush, Indian ricegrass, needleandthread

*Percent of surface covered by rock fragments:* 50 percent cobbles

### Typical Profile

0 to 2 inches—very cobbly fine sand; 50 to 60 percent cobbles (by weight); single grained; loose; neutral (pH 6.6); nonsaline; nonsodic; estimated Unified classification—SM; estimated AASHTO classification—A-2

2 to 9 inches—very cobbly fine sand; 60 to 70 percent cobbles (by weight); massive; soft, friable; neutral (pH 6.6); estimated Unified classification—SM; estimated AASHTO classification—A-2

9 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 2 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* 0.2 to 1.0 inch

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### Ratings for Various Uses

*Range seeding:* Poor—droughty, large stones

### Interpretive Groups

*Range site:* 026X060N

*Woodland ordination symbol:* 1X

## 1032—Goldyke-Trocken association

### Map Unit Setting

*Position on landscape:* Rock pediment remnants and inset fans and fanettes

*Elevation:* 4,500 to 5,500 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Goldyke gravelly sandy loam, 4 to 15 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—50 percent

- Trocken gravelly loamy sand, 4 to 15 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Haplic Durargids, gravelly loamy sand, 2 to 8 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—7 percent

- Inclusion 2: Typic Torriorthents, gravelly sandy loam, 15 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—5 percent

- Inclusion 3: Izo very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

- Inclusion 4: Rock outcrop—1 percent

### **Characteristics of the Goldyke Soil**

*Position on landscape:* Rock pediments

*Parent material:* Kind—residuum and colluvium; source—rhyolite and rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta, Indian ricegrass

### **Typical Profile**

0 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 6 inches—gravelly sandy loam, gravelly fine sandy loam; 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2

6 to 22 inches—weathered bedrock

22 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 2 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Trocken Soil**

*Position on landscape:* Inset fans and fanettes

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### **Typical Profile**

0 to 3 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure parting to platy; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 60 inches—stratified gravelly loam to extremely gravelly loamy coarse sand; 0 to 15 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Nonburied summits of fan piedmont remnants  
*Slope features:* Length—very short; shape—slightly convex  
*Contrasting features:* Layer of clay accumulation, strongly cemented duripan within a depth of 20 inches

#### **Inclusion 2**

*Position on landscape:* Side slopes of rock pediments  
*Slope features:* Length—very short; shape—convex  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale, King desertgrass

#### **Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* Sandy textures throughout the profile, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Exposed bedrock  
*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Goldyke Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Moderate—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Trocken Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope, flooding

*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Goldyke soil—VII<sub>s</sub>, nonirrigated; Trocken soil—VII<sub>s</sub>, nonirrigated  
*Range site:* Goldyke soil—029X022N; Trocken soil—027X018N

## **1033—Goldyke-Blacktop-Koyen association**

### **Map Unit Setting**

*Position on landscape:* Mountains, hills, and fans  
*Elevation:* 4,500 to 5,700 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 135 days

### **Composition**

#### *Major components:*

- Goldyke gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—55 percent
  - Blacktop very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—20 percent
  - Koyen fine sandy loam, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—10 percent
- Contrasting inclusions:*
- Inclusion 1: Typic Haplargids, gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, fine-loamy, mixed, mesic)—5 percent
  - Inclusion 2: Rock outcrop—4 percent
  - Inclusion 3: Belted gravelly sandy loam, 8 to 30 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—4 percent
  - Inclusion 4: Xeric Torriorthents, very gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent

### **Characteristics of the Goldyke Soil**

*Position on landscape:* Side slopes and shoulder slopes of hills  
*Parent material:* Kind—residuum and colluvium; source—rhyolite and rhyolitic tuff  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta, Indian ricegrass

**Typical Profile**

0 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 9 inches—gravelly sandy loam, gravelly fine sandy loam; 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2

9 to 27 inches—weathered bedrock

27 to 31 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 2 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Blacktop Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

**Typical Profile**

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Koyen Soil**

*Position on landscape:* Fanlettes and remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, galleta, Indian ricegrass, spiny hopsage

**Typical Profile**

0 to 2 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

2 to 18 inches—sandy loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

18 to 40 inches—stratified loam to gravelly loamy sand; 15 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

40 to 60 inches—gravelly loamy sand, very gravelly loamy sand; 45 to 55 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 6 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial fan remnants and toe slopes of hills  
*Contrasting features:* Layer of clay accumulation, bedrock at a depth of more than 60 inches

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Exposed bedrock  
*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Ballenas  
*Slope features:* Length—short; shape—convex  
*Contrasting features:* Layer of clay accumulation, strongly cemented duripan within a depth of 14 inches

#### Inclusion 4

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Other inclusions (in only a few areas):** Old Camp very gravelly loam, 15 to 50 percent slopes

*Position on landscape:* Upper north-facing slopes  
*Contrasting features:* Higher water-supplying capacity, layer of clay accumulation  
*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Goldyke Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Blacktop Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Koyen Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Goldyke soil—VII<sub>s</sub>, nonirrigated; Blacktop soil—VII<sub>s</sub>, nonirrigated; Koyen soil—III<sub>e</sub>, irrigated, and VII<sub>c</sub>, nonirrigated

*Range site:* Goldyke soil—029X022N; Blacktop soil—029X033N; Koyen soil—029X046N

## 1040—Isolde-Hawsley association

### Map Unit Setting

*Position on landscape:* Sand dunes and sand sheets  
*Elevation:* 4,800 to 5,400 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

#### Major components:

- Isolde fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—50 percent
- Hawsley loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—40 percent

#### Contrasting inclusions:

- Inclusion 1: Bluewing gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Luning gravelly loamy sand, gravelly substratum, 2 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—5 percent

### Characteristics of the Isolde Soil

*Position on landscape:* Semistabilized sand dunes

*Parent material:* Mixed eolian material

*Slope features:* Length—very short; shape—convex to concave

*Dominant present vegetation:* Indian ricegrass, hairy horsebrush, fourwing saltbush, littleleaf horsebrush

#### Typical Profile

0 to 6 inches—fine sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

6 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Hawsley Soil

*Position on landscape:* Sand sheets over fan piedmonts

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood, Nevada dalea, fourwing saltbush

#### Typical Profile

0 to 3 inches—loamy sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 to 60 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels

*Slope features:* Length—long; shape—concave

*Contrasting features:* More than 35 percent pebbles at a depth of more than 10 inches, frequently flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 2

*Position on landscape:* Fan skirts with sand sheets

*Slope features:* Length—long; shape—smooth

*Contrasting features:* More than 35 percent pebbles at a depth of more than 30 inches

*Distinctive present vegetation:* Indian ricegrass, Cooper wolfberry, fourwing saltbush, Bailey greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Isolde Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### Ratings of the Hawsley Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### Interpretive Groups

*Capability classification:* Isolde soil—IVs, irrigated, and VIIs, nonirrigated; Hawsley soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Isolde soil—027X023N; Hawsley soil—027X009N

## 1041—Isolde-Playas-Wabuska association

### Map Unit Setting

*Position on landscape:* Bolson floors

*Elevation:* 4,000 to 4,500 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Isolde fine sand, warm, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—50 percent
- Playas—25 percent
- Wabuska loamy sand, 0 to 2 percent slopes (Aeric Halaquepts, coarse-loamy, mixed [calcareous], mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Gynelle very gravelly loamy sand, alkali, 0 to 2 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 2: Typic Salorthids, loam, 0 to 2 percent slopes (Typic Salorthids, fine, loamy, mixed, mesic)—1 percent

### Characteristics of the Isolde Soil

*Position on landscape:* Semistabilized sand dunes

*Parent material:* Mixed eolian material

*Slope features:* Length—very short; shape—convex to concave

*Dominant present vegetation:* Black greasewood, seepweed

### Typical Profile

0 to 6 inches—fine sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

6 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Playas**

*Position on landscape:* Playas (slightly concave)

*Slope features:* Length—long; shape—plane

*Dominant present vegetation:* None

*Flooding:* Frequency—frequent; duration—very long; months—December to August

### **Characteristics of the Wabuska Soil**

*Position on landscape:* Lake plains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, seepweed, inland saltgrass, Torrey quailbush

### **Typical Profile**

0 to 9 inches—loamy sand; 0 to 5 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.6); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

9 to 60 inches—stratified sand to silt loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM, SM-SC, CL-ML, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 36 to 48 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Pondered

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Fan skirts

*Slope features:* Length—long; shape—smooth

*Contrasting features:* More than 35 percent pebbles throughout the profile

*Distinctive present vegetation:* Cooper wolfberry

#### **Inclusion 2**

*Position on landscape:* Lake plains

*Slope features:* Length—long; shape—smooth

*Contrasting features:* More than 18 percent clay between depths of 10 and 40 inches

*Distinctive present vegetation:* Torrey quailbush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Isolde Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage, piping

### **Ratings of the Wabuska Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—good; domestic grasses and legumes

(irrigated)—good; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—fair; shallow water areas—fair

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, excess sodium

### **Interpretive Groups**

*Capability classification:* Isolde soil—IVs, irrigated, and VIIs, nonirrigated; Playas—VIIIw; Wabuska soil—IIIw, irrigated, and VIw, nonirrigated

*Range site:* Isolde soil—027X016N; Wabuska soil—027X025N

## 1042—Isolde-Dune land association

### Map Unit Setting

*Position on landscape:* Dunes  
*Elevation:* 4,000 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

#### Major components:

- Isolde fine sand, 4 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—70 percent
- Dune land—20 percent

#### Contrasting inclusions:

- Inclusion 1: Stumble loamy sand, 2 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent
- Inclusion 2: Sundown loamy sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent
- Inclusion 3: Eastgate gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy, mixed, mesic)—2 percent
- Inclusion 4: Rock outcrop—2 percent

### Characteristics of the Isolde Soil

*Position on landscape:* Semistabilized dunes  
*Parent material:* Mixed eolian material  
*Slope features:* Length—very short; shape—convex to concave  
*Dominant present vegetation:* Indian ricegrass, hairy horsebrush, fourwing saltbush

### Typical Profile

0 to 6 inches—fine sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3  
 6 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—moderate; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Dune Land

*Position on landscape:* Unstabilized dunes  
*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sand sheets  
*Slope features:* Length—short  
*Contrasting features:* Gravelly strata in the upper 40 inches  
*Distinctive present vegetation:* Littleleaf horsebrush, Nevada dalea, Indian ricegrass, Bailey greasewood

#### Inclusion 2

*Position on landscape:* Sand sheets  
*Slope features:* Length—short  
*Contrasting features:* Loamy sand textures, more stable surface  
*Distinctive present vegetation:* Indian ricegrass, Cooper wolfberry, fourwing saltbush

#### Inclusion 3

*Position on landscape:* Fan skirts  
*Slope features:* Length—long  
*Contrasting features:* More than 35 percent rock fragments at a depth of more than 30 inches, sandy loam layer in the upper 20 inches  
*Distinctive present vegetation:* Shadscale, Cooper wolfberry, Bailey greasewood

#### Inclusion 4

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Exposed bedrock  
*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Isolde Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too sandy, soil blowing  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### **Interpretive Groups**

*Capability classification:* Isolde soil—VIIIs, nonirrigated; Dune land—VIIIe

*Range site:* Isolde soil—027X023N

## **1043—Isolde-Cirac-Playas association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,150 to 4,500 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

### **Composition**

*Major components:*

- Isolde fine sand, warm, 8 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—50 percent
  - Cirac sandy clay loam, ponded, 0 to 4 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—25 percent
  - Playas—15 percent
- Contrasting inclusions:*
- Inclusion 1: Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—10 percent

### **Characteristics of the Isolde Soil**

*Position on landscape:* Semistabilized dunes

*Parent material:* Mixed eolian material

*Slope features:* Length—very short; shape—convex to concave

*Dominant present vegetation:* Black greasewood, hairy horsebrush, Indian ricegrass

### **Typical Profile**

0 to 6 inches—fine sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

6 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—moderate; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Cirac Soil**

*Position on landscape:* Interdune flats

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, seepweed

### **Typical Profile**

0 to 5 inches—sandy clay loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6

5 to 60 inches—stratified gravelly sand to silt loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—February to September

*Permeability:* Moderately rapid

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Low

### **Characteristics of the Playas**

*Position on landscape:* Playas  
*Slope features:* Length—long; shape—plane  
*Dominant present vegetation:* None  
*Flooding:* Frequency—frequent; duration—very long; months—December to August

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial flats  
*Slope features:* Length—short; shape—smooth  
*Contrasting features:* More silty textures in the upper 48 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Isolde Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—piping, seepage

### **Ratings of the Cirac Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Shallow excavations:* Moderate—flooding  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—piping, excess sodium

### **Interpretive Groups**

*Capability classification:* Isolde soil—VII<sub>s</sub>, nonirrigated;

Cirac soil—III<sub>w</sub>, irrigated, and VII<sub>w</sub>, nonirrigated;  
 Playas—VIII<sub>w</sub>  
*Range site:* Isolde soil—027X016N; Cirac soil—027X025N

## **1044—Isolde-Patna-Hawsley association**

### **Map Unit Setting**

*Position on landscape:* Lake plains with partial sand sheets  
*Elevation:* 4,100 to 4,300 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 135 days

### **Composition**

#### *Major components:*

- Isolde fine sand, 2 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—55 percent
- Patna loamy sand, 0 to 4 percent slopes (Typic Haplargids, coarse-loamy, mixed, mesic)—25 percent
- Hawsley sand, 0 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—10 percent

#### *Contrasting inclusions:*

- Inclusion 1: Slaw very fine sandy loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—4 percent
- Inclusion 2: Bango sandy loam, 0 to 2 percent slopes (Typic Haplargids, fine-loamy, mixed, mesic)—4 percent
- Inclusion 3: Playas—1 percent
- Inclusion 4: Badland—1 percent

### **Characteristics of the Isolde Soil**

*Position on landscape:* Semistabilized dunes  
*Parent material:* Mixed eolian material  
*Slope features:* Length—very short; shape—convex to concave  
*Dominant present vegetation:* Indian ricegrass, black greasewood, fourwing saltbush, hairy horsebrush

### **Typical Profile**

0 to 6 inches—fine sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3  
 6 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Patna Soil**

*Position on landscape:* Lake-plain terraces  
*Parent material:* Eolian material and sandy lacustrine sediments  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Bailey greasewood, shadscale, bud sagebrush, Indian ricegrass

**Typical Profile**

0 to 6 inches—loamy sand; 0 to 5 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 6 to 24 inches—sandy loam, coarse sandy loam, fine sandy loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4  
 24 to 43 inches—sand, loamy sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30-46); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3  
 43 to 60 inches—loamy sand, fine sand, loamy fine sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 30-46); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Hawsley Soil**

*Position on landscape:* Sand sheets  
*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, Bailey greasewood, Nevada dalea

**Typical Profile**

0 to 8 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3  
 8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3  
 42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Flood-plain playas

*Slope features:* Length—very short; shape—plane

*Contrasting features:* Stratified very fine sandy loam to silty clay loam throughout the profile, no layer of clay accumulation

*Distinctive present vegetation:* Black greasewood, seepweed, inland saltgrass

#### **Inclusion 2**

*Position on landscape:* Lake-plain terraces

*Contrasting features:* Strata of loamy fine sand to silty clay loam within a depth of 40 inches

#### **Inclusion 3**

*Position on landscape:* Small sink areas

*Contrasting features:* Pondered for short periods

*Distinctive present vegetation:* None

#### **Inclusion 4**

*Position on landscape:* Exposed highly erosive areas of lake sediments

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Isolde Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, droughty

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage, piping

#### **Ratings of the Patna Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—thin layer

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, seepage

#### **Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### **Interpretive Groups**

*Capability classification:* Isolde soil—IVs, irrigated, and VIIs, nonirrigated; Patna soil—IIIs, irrigated, and VIIs, nonirrigated; Hawsley soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Isolde soil—027X016N; Patna soil—027X018N; Hawsley soil—027X009N

## **1072—Rednik-Trocken-Bluewing association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,800 to 5,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Rednik very gravelly sandy loam, 2 to 8 percent

slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—40 percent

- Trocken gravelly fine sandy loam, 2 to 8 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—25 percent

- Bluewing very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rednik very gravelly sandy loam, 8 to 15 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—4 percent

- Inclusion 2: Bluewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Goldyke gravelly sandy loam, 4 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—4 percent

- Inclusion 4: Hawsley loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent

### **Characteristics of the Rednik Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass, bud sagebrush

### **Typical Profile**

0 to 6 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 11 inches—very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly loam; 5 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 to 16 inches—very gravelly sandy loam, very gravelly fine sandy loam; 5 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable;

strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

16 to 60 inches—very gravelly sand, extremely gravelly loamy sand; 5 to 30 percent cobbles and stones, 40 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.4); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM, SP-SM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Trocken Soil**

*Position on landscape:* Higher inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass, bud sagebrush

### **Typical Profile**

0 to 3 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure parting to platy; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 60 inches—stratified gravelly loam to extremely gravelly loamy coarse sand; 0 to 15 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Bluewing Soil

*Position on landscape:* Lower inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass, bud sagebrush

### Typical Profile

0 to 7 inches—very gravelly loamy sand; 5 to 15 percent cobbles and stones, 65 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1  
 7 to 60 inches—stratified very gravelly coarse sand to extremely gravelly loamy sand; 15 to 25 percent cobbles and stones, 65 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Slope features:* Length—very short; shape—convex  
*Contrasting features:* Slopes of more than 8 percent

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* Low hills adjacent to rock outcrop; most common in the Rawhide area

*Contrasting features:* Depth to bedrock less than 20 inches

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 4

*Position on landscape:* Sand sheets over inset fans

*Slope features:* Length—short; shape—smooth

*Contrasting features:* Less than 15 percent rock fragments throughout the profile

*Distinctive present vegetation:* Indian ricegrass, littleleaf horsebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Rednik Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Trocken Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand*: Improbable source—excess fines  
*Gravel*: Improbable source—excess fines  
*Embankments, dikes, and levees*: Severe—seepage

#### **Ratings of the Bluewing Soil for Various Uses**

*Wildlife habitat elements*: Wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding*: Poor—too arid, too sandy, small stones  
*Shallow excavations*: Severe—cutbanks cave  
*Local roads and streets*: Moderate—flooding  
*Roadfill*: Good  
*Sand*: Probable source  
*Gravel*: Probable source  
*Embankments, dikes, and levees*: Severe—seepage

#### **Interpretive Groups**

*Capability classification*: Rednik soil—VIIIs, nonirrigated;  
 Trocken soil—VIIc, nonirrigated; Bluewing soil—  
 VIIIs, nonirrigated  
*Range site*: Rednik soil—027X018N; Trocken soil—  
 027X018N; Bluewing soil—027X018N

### **1090—Singatse-Theon-Rock outcrop association**

#### **Map Unit Setting**

*Position on landscape*: Hills and mountains  
*Elevation*: 4,700 to 6,000 feet  
*Average annual precipitation*: About 5 inches  
*Average annual air temperature*: About 53 degrees F  
*Frost-free season*: About 130 days

#### **Composition**

##### *Major components*:

- Singatse very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—45 percent
- Theon very stony fine sandy loam, 30 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—25 percent
- Rock outcrop—15 percent

##### *Contrasting inclusions*:

- Inclusion 1: Goldyke gravelly sandy loam, 4 to 15 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—10 percent
- Inclusion 2: Rednik very gravelly sandy loam, 4 to 8 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Old Camp extremely stony loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent

#### **Characteristics of the Singatse Soil**

*Position on landscape*: Hills and side slopes of mountains  
*Parent material*: Kind—colluvium and residuum; source—volcanic rock  
*Slope features*: Length—short; shape—convex to concave  
*Dominant present vegetation*: Shadscale, Bailey greasewood

#### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 45 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 3 to 9 inches—very gravelly sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 9 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock*: 4 to 10 inches  
*Depth to seasonal high water table*: More than 60 inches  
*Frequency of flooding*: None  
*Permeability*: Moderate  
*Available water capacity*: Less than 1 inch  
*Water-supplying capacity*: About 3 inches  
*Runoff*: Very rapid  
*Hydrologic group*: D  
*Erosion factors (surface layer)*: K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion*: By water—severe; by wind—slight  
*Shrink-swell potential*: Low  
*Corrosivity*: Steel—high; concrete—low  
*Potential for frost action*: Low

#### **Characteristics of the Theon Soil**

*Position on landscape*: Side slopes and shoulder slopes of mountains, hills  
*Parent material*: Kind—residuum; source—rhyolitic tuff, andesite  
*Slope features*: Length—short; shape—convex to concave  
*Dominant present vegetation*: Bailey greasewood, shadscale

*Percent of surface covered by rock fragments:* 30 percent pebbles, 10 percent cobbles, 15 percent stones

### Typical Profile

0 to 1 inch—very stony fine sandy loam; 15 to 55 percent cobbles and stones, 25 to 55 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2, A-4

1 to 8 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 5 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Hills

*Slope features:* Length—short; shape—convex

*Contrasting features:* Soft bedrock within a depth of 20 inches

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 2

*Position on landscape:* Alluvial fans and toe slopes of hills

*Contrasting features:* Bedrock at a depth of more than 60 inches

#### Inclusion 3

*Position on landscape:* North-facing side slopes of mountains at upper elevations

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Singatse Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Theon Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Singatse soil—VIIIs, nonirrigated; Theon soil—VIIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Singatse soil—027X027N; Theon soil—027X019N

## 1091—Singatse-Gynelle-Izo association

### Map Unit Setting

*Position on landscape:* Hills and piedmont slopes

*Elevation:* 4,200 to 5,200 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Singatse very gravelly sandy loam, 8 to 15 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—50 percent
- Gynelle very gravelly loamy sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent
- Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Theon very stony fine sandy loam, 4 to 15 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Oricto very cobbly fine sandy loam, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Hawsley gravelly loamy sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent

### **Characteristics of the Singatse Soil**

*Position on landscape:* Hills and rock pediments

*Parent material:* Kind—colluvium and residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

#### **Typical Profile**

- 0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 45 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 2 to 6 inches—very gravelly sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 6 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Gynelle Soil**

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, Cooper wolfberry, shadscale

#### **Typical Profile**

- 0 to 2 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1
- 2 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Burrobrush, rabbitbrush,  
Bailey greasewood

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SP, GP, GP-GM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and shoulder slopes of low hills

*Slope features:* Length—short; shape—convex

*Contrasting features:* Layer of clay accumulation

#### **Inclusion 2**

*Position on landscape:* Summits of fan piedmont remnants

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* Layer of clay accumulation, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Cooper wolfberry, shadscale

#### **Inclusion 3**

*Position on landscape:* Sand sheets over fans and rock pediments

*Slope features:* Length—short; shape—smooth

*Contrasting features:* Less than 15 percent rock fragments throughout the profile, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Littleleaf horsebrush, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Singatse Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Gynelle Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Singatse soil—VIIIs,

nonirrigated; Gynelle soil—VIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Singatse soil—027X027N; Gynelle soil—027X043N; Izo soil—029X041N

## 1094—Singatse-Hawsley association

### Map Unit Setting

*Position on landscape:* Hills and sand sheets

*Elevation:* 4,300 to 4,500 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Singatse very stony sandy loam, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—45 percent
- Hawsley loamy sand, 8 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—10 percent
- Inclusion 2: Isolde fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent

### Characteristics of the Singatse Soil

*Position on landscape:* Side slopes and shoulder slopes of hills

*Parent material:* Kind—colluvium and residuum; source—volcanic rock

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

*Percent of surface covered by rock fragments:* 8 percent stones

### Typical Profile

0 to 3 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

3 to 9 inches—very gravelly sandy loam, very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated

AASHTO classification—A-1, A-2  
9 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Hawsley Soil

*Position on landscape:* Sand sheets over toe slopes of hills

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, Bailey greasewood, Nevada dalea

### Typical Profile

0 to 8 inches—loamy sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Semistabilized sand dunes

*Slope features:* Length—very short; shape—convex to concave

*Contrasting features:* Bedrock at a depth of more than 60 inches, fine sand throughout the profile, more erosive surface

*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Singatse Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### **Interpretive Groups**

*Capability classification:* Singatse soil—VIIIs, nonirrigated; Hawsley soil—IVs, irrigated, and VIIIs, nonirrigated

*Range site:* Singatse soil—027X027N; Hawsley soil—027X009N

## **1121—Theon-Old Camp association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,400 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Theon very gravelly sandy loam, 30 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—65 percent
- Old Camp very stony loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Singatse very stony sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
- Inclusion 3: Nemico very stony sandy loam, 8 to 30 percent slopes (Typic Nadurargids, clayey, montmorillonitic, mesic, shallow)—4 percent

### **Characteristics of the Theon Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff, andesite

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Bailey greasewood, shadscale

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard,

very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-1, A-2

3 to 12 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

12 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Old Camp Soil

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage

*Percent of surface covered by rock fragments:* 25 percent pebbles, 10 percent cobbles, 5 percent stones

### Typical Profile

0 to 2 inches—very stony loam; 25 to 55 percent cobbles and stones, 35 to 45 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

2 to 14 inches—very cobbly clay loam, extremely stony sandy clay loam, very stony loam; 35 to 50 percent

cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Side slopes of mountains

*Contrasting features:* No layer of clay accumulation, lower water-supplying capacity

#### Inclusion 3

*Position on landscape:* Crests of ridges

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Cemented pan within a depth of 20 inches, layer of clay accumulation with more than 35 percent clay, slight sodicity

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Theon Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Old Camp Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, slope, large stones  
*Local roads and streets:* Severe—depth to bedrock, slope, large stones  
*Roadfill:* Poor—depth to bedrock, slope, large stones  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Interpretive Groups**

*Capability classification:* Theon soil—VIIs, nonirrigated; Old Camp soil—VIIs, nonirrigated  
*Range site:* Theon soil—027X019N; Old Camp soil—027X007N

### **1127—Theon very gravelly sandy loam, 8 to 30 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Hills and rock pediments  
*Elevation:* 5,200 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

#### **Composition**

*Major components:*

- Theon very gravelly sandy loam, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Singatse very gravelly sandy loam, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—10 percent
- Inclusion 2: Rock outcrop—5 percent

#### **Characteristics of the Theon Soil**

*Position on landscape:* Hills and rock pediments  
*Parent material:* Kind—residuum; source—rhyolitic tuff, andesite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Bailey greasewood, shadscale

#### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-1, A-2  
 2 to 11 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 11 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Side slopes of hills  
*Slope features:* Length—short; shape—convex to concave  
*Contrasting features:* No layer of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Shadscale

##### **Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Theon Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* VIIs  
*Range site:* 027X019N

## **1130—Uripnes-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,000 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Uripnes very stony sandy loam, 15 to 50 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—50 percent
  - Rock outcrop—35 percent
- Contrasting inclusions:*
- Inclusion 1: Budihol very stony sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—7 percent
  - Inclusion 2: Blacktop very stony sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—6 percent
  - Inclusion 3: Izo very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Uripnes Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass  
*Percent of surface covered by rock fragments:* 7 percent stones

### **Typical Profile**

0 to 3 inches—very stony sandy loam; 20 to 35 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 3 to 21 inches—weathered bedrock  
 21 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* Weathered bedrock at 3 to 8 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges  
*Slope features:* Rounded peaks and ridges and smooth convex areas with rock exposed at the surface  
*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of mountains at higher elevations  
*Slope features:* Length—short; shape—convex to concave  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### **Inclusion 2**

*Position on landscape:* Side slopes of mountains  
*Slope features:* Length—short; shape—convex to concave  
*Contrasting features:* Lower water-supplying capacity, hard bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Shadscale, Bailey greasewood

**Inclusion 3**

*Position on landscape:* Channels

*Slope features:* Length—long; shape—concave

*Contrasting features:* Frequently flooded, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Uripnes Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Uripnes soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Uripnes soil—027X047N

**1131—Uripnes-Budihol-Rock outcrop association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Uripnes extremely bouldery sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—35 percent
- Budihol extremely bouldery sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—35 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rubble land—10 percent
- Inclusion 2: Luning fine sand, gravelly substratum, 4 to 15 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—5 percent

**Characteristics of the Uripnes Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass

*Percent of surface covered by rock fragments:* 15 percent stones, 10 percent boulders

**Typical Profile**

0 to 4 inches—extremely bouldery sandy loam; 45 to 60 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* Weathered bedrock at 3 to 8 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

**Characteristics of the Budihol Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, Nevada ephedra

*Percent of surface covered by rock fragments:* 25 percent pebbles, 15 percent stones, 20 percent boulders

**Typical Profile**

0 to 2 inches—extremely bouldery sandy loam; 20 to 50

percent cobbles and stones, 15 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 10 inches—gravelly coarse sandy loam, gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

10 to 21 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Rock Outcrop

*Position on landscape:* Rounded knobs and areas of exposed rock on convex mountain side slopes

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of mountains

*Contrasting features:* More than 90 percent stones and boulders on the surface

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Toe slopes with sand sheets

*Slope features:* Length—short; shape—convex

*Contrasting features:* Hard bedrock at a depth of more than 60 inches, sandy textures throughout the profile

*Distinctive present vegetation:* Nevada dalea, Indian ricegrass, littleleaf horsebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Uripnes Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### Ratings of the Budihol Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Uripnes soil—VIIs, nonirrigated;

Budihol soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Uripnes soil—027X047N; Budihol soil—027X007N

### 1136—Uripnes-Pumel-Rock outcrop association

#### Map Unit Setting

*Position on landscape:* Mountains and hills

*Elevation:* 5,500 to 6,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

#### Composition

*Major components:*

- Uripnes extremely bouldery sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—40 percent
- Pumel very gravelly sandy loam, 30 to 50 percent slopes (Typic Torriorthents, loamy-skeletal, mixed)

[calcareous], mesic, shallow)—35 percent

- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Downeyville very stony sandy loam, moist, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Inmo very gravelly loamy sand, frequently flooded, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Petspring very bouldery coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—2 percent

**Characteristics of the Uripnes Soil**

*Position on landscape:* South- to southeast-facing side slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones, 15 percent boulders

**Typical Profile**

0 to 3 inches—extremely bouldery sandy loam; 45 to 60 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* Weathered bedrock at 3 to 8 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

**Characteristics of the Pumel Soil**

*Position on landscape:* Predominantly north- to northwest-facing side slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta, Indian ricegrass, Nevada ephedra

**Typical Profile**

0 to 1 inch—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

1 to 4 inches—very gravelly coarse sandy loam, extremely gravelly sandy loam; 10 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-GM; estimated AASHTO classification—A-1

4 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Shoulder slopes and summits of hills and mountains

*Slope features:* Length—short; shape—convex

*Contrasting features:* Layer of clay accumulation, hard bedrock within a depth of 20 inches

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 3**

*Position on landscape:* North-facing side slopes of mountains at higher elevations

*Contrasting features:* Higher water-supplying capacity, more organic matter throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, desert needlegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Uripnes Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope, large stones

*Local roads and streets:* Severe—large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### **Ratings of the Pumel Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, seepage

### **Interpretive Groups**

*Capability classification:* Uripnes soil—VIIIs, nonirrigated;

Pumel soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs  
*Range site:* Uripnes soil—027X047N; Pumel soil—029X037N

## **1138—Uripnes-Petspring-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains and hills

*Elevation:* 5,700 to 6,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Uripnes extremely bouldery sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—40 percent
- Petspring very bouldery coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—25 percent
- Rock outcrop—25 percent

*Contrasting inclusions:*

- Inclusion 1: Budihol gravelly sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—10 percent

### **Characteristics of the Uripnes Soil**

*Position on landscape:* South-, west-, and east-facing side slopes of mountains and hills

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones, 15 percent boulders

### **Typical Profile**

0 to 3 inches—extremely bouldery sandy loam; 45 to 60 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* Weathered bedrock at 3 to 8 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Petspring Soil**

*Position on landscape:* North-facing side slopes of mountains and hills  
*Parent material:* Kind—colluvium and residuum; source—granitic rock  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass  
*Percent of surface covered by rock fragments:* 15 percent stones, 5 percent boulders

**Typical Profile**

0 to 1 inch—very bouldery coarse sandy loam; 15 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-1  
 1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 3 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 3 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered rounded knobs of exposed bedrock  
*Dominant present vegetation:* None

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* North-facing side slopes of hills and mountains at higher elevations  
*Slope features:* Length—short; shape—convex to concave  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

**Ratings of the Uripnes Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, large stones, slope  
*Local roads and streets:* Severe—large stones, slope  
*Roadfill:* Poor—depth to bedrock, large stones, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

**Ratings of the Petspring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Uripnes soil—VIIIs, nonirrigated; Petspring soil—VIIIs, nonirrigated; Rock outcrop—VIIIs

Range site: Uripnes soil—027X047N; Petspring soil—027X065N

## 1139—Uripnes-Zyzzzi-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Mountains and hills  
*Elevation:* 5,500 to 6,500 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Uripnes very stony sandy loam, 30 to 50 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—40 percent
- Zyzzzi very gravelly sandy loam, 15 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—25 percent
- Rock outcrop—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly sandy loam, 30 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic, shallow)—10 percent
- Inclusion 2: Typic Haplargids, very gravelly sandy loam, 15 to 30 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic, shallow)—5 percent

### Characteristics of the Uripnes Soil

*Position on landscape:* Side slopes of mountains and hills

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass

*Percent of surface covered by rock fragments:* 6 percent stones

### Typical Profile

0 to 3 inches—very stony sandy loam; 20 to 35 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* Weathered bedrock at 3 to 8 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### Characteristics of the Zyzzzi Soil

*Position on landscape:* North-facing side slopes and shoulder slopes of mountains and hills

*Parent material:* Kind—residuum; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Low sagebrush, galleta, bottlebrush squirreltail

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 6 inches—extremely gravelly sandy clay loam, very gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, SM; estimated AASHTO classification—A-2

6 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered rounded knobs

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of mountains and hills

*Contrasting features:* Higher water-supplying capacity, no layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Foot slopes of mountains and hills

*Contrasting features:* Layer of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, galleta

**Other inclusions (in only a few areas):** Chill gravelly sandy loam (Xerollic Haplargids, loamy, mixed, mesic, shallow)

*Position on landscape:* Small areas on low hills adjacent to Lyon County line

*Distinctive present vegetation:* Wyoming big sagebrush, needlegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Uripnes Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Zyzzi Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Uripnes soil—VIIIs, nonirrigated; Zyzzi soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Uripnes soil—027X047N; Zyzzi soil—027X049N

## **1140—Wabuska-Isolde association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,100 to 4,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Wabuska loam, 0 to 2 percent slopes (Aeric Halaquepts, coarse-loamy, mixed [calcareous], mesic)—60 percent

- Isolde fine sand, warm, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, very gravelly loamy sand, 0 to 2 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Typic Haplargids, very cobbly fine sandy loam, 2 to 4 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—4 percent

### **Characteristics of the Wabuska Soil**

*Position on landscape:* Lake plains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, seepweed

### **Typical Profile**

0 to 14 inches—loam; massive; soft, very friable; very strongly alkaline (pH 9.6); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

14 to 60 inches—stratified sand to silt loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline to

slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM, SM-SC, CL-ML, ML; estimated AASHTO classification—A-4

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* 36 to 48 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 8 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Pondered  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* High

#### Characteristics of the Isolde Soil

*Position on landscape:* Semistabilized sand dunes  
*Parent material:* Mixed eolian material  
*Slope features:* Length—very short; shape—convex to concave  
*Dominant present vegetation:* Black greasewood, seepweed, Indian ricegrass

#### Typical Profile

0 to 4 inches—fine sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3  
 4 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Alluvial flats

*Contrasting features:* More than 35 percent rock fragments throughout the profile, water table at a depth of more than 60 inches

*Distinctive present vegetation:* Cooper wolfberry

##### Inclusion 2

*Position on landscape:* Fan skirts

*Contrasting features:* Layer of clay accumulation, water table at a depth of more than 60 inches

*Distinctive present vegetation:* Cooper wolfberry

#### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### Ratings of the Wabuska Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—fair; shallow water areas—fair

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, excess sodium

#### Ratings of the Isolde Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### **Interpretive Groups**

*Capability classification:* Wabuska soil—IIIw, irrigated, and VIw, nonirrigated; Isolde soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Wabuska soil—027X025N; Isolde soil—027X016N

## **1141—Wabuska-Playas-Isolde association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,100 to 4,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Wabuska loam, strongly saline-alkali, 0 to 2 percent slopes (Aeric Halaquepts, coarse-loamy, mixed [calcareous], mesic)—40 percent
- Playas—30 percent
- Isolde fine sand, warm, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Natrargids, loam, 0 to 2 percent slopes (Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Typic Torriorthents, very gravelly loamy sand, 0 to 2 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Bluewing very gravelly loamy sand, frequently flooded, 0 to 2 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Wabuska Soil**

*Position on landscape:* Lake plains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Inland saltgrass, black greasewood, alkali sacaton

### **Typical Profile**

0 to 9 inches—loam; massive; soft, very friable; very strongly alkaline (pH 9.6); strongly saline (more than 16 mmhos/cm); moderately sodic to strongly sodic (SAR 30 to 70); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 60 inches—stratified sand to silt loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM, SM-SC, CL-ML, ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 0 to 42 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 20 inches

*Runoff:* Pondered

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* High

### **Characteristics of the Playas**

*Position on landscape:* Sink areas

*Slope features:* Length—long; shape—plane

*Dominant present vegetation:* None

*Flooding:* Frequency—frequent; duration—very long; months—December to August

### **Characteristics of the Isolde Soil**

*Position on landscape:* Semistabilized sand dunes

*Parent material:* Mixed eolian material

*Slope features:* Length—very short; shape—concave to convex

*Dominant present vegetation:* Black greasewood, Indian ricegrass, hairy horsebrush

### **Typical Profile**

0 to 6 inches—fine sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

6 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial flats  
*Contrasting features:* Layer of clay accumulation, water table at a depth of more than 60 inches  
*Distinctive present vegetation:* Black greasewood, inland saltgrass

#### **Inclusion 2**

*Position on landscape:* Alluvial flats  
*Contrasting features:* More than 35 percent rock fragments between depths of 10 and 40 inches, water table at a depth of more than 60 inches  
*Distinctive present vegetation:* Cooper wolfberry, black greasewood

#### **Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* More than 35 percent rock fragments throughout the profile, water table at a depth of more than 60 inches, frequently flooded

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Wabuska Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair  
*Range seeding:* Poor—excess salt, excess sodium  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—frost action  
*Roadfill:* Fair—wetness  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—piping, excess salt, excess sodium

### **Ratings of the Isolde Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—piping, seepage

### **Interpretive Groups**

*Capability classification:* Wabuska soil—VIIw, nonirrigated; Playas—VIIIw; Isolde soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Wabuska soil—027X005N; Isolde soil—027X016N

## **1142—Wabuska-Playas association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors  
*Elevation:* 4,400 to 5,000 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Wabuska loam, strongly saline-alkali, 0 to 2 percent slopes (Aeric Halaquepts, coarse-loamy, mixed [calcareous], mesic)—65 percent
- Playas—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Aeric Halaquepts, very fine sandy loam, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed, mesic)—8 percent
- Inclusion 2: Cirac gravelly loamy fine sand, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—4 percent
- Inclusion 3: Isolde fine sand, warm, 8 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent

### **Characteristics of the Wabuska Soil**

*Position on landscape:* Lake plains

*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Inland saltgrass, black greasewood, rubber rabbitbrush

### Typical Profile

0 to 9 inches—loam; massive; soft, very friable; very strongly alkaline (pH 9.6); strongly saline (more than 16 mmhos/cm); moderately sodic to strongly sodic (SAR 30 to 70); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 60 inches—stratified sand to silt loam; 0 to 10 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM, SM-SC, CL-ML, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* 0 to 42 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 7 inches  
*Water-supplying capacity:* About 20 inches  
*Runoff:* Pondered  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* High

### Characteristics of the Playas

*Position on landscape:* Sink areas  
*Slope features:* Length—long; shape—plane  
*Dominant present vegetation:* None  
*Flooding:* Frequency—frequent; duration—very long; months—December to August

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Alluvial flats  
*Contrasting features:* More than 18 percent clay between depths of 10 and 40 inches  
*Distinctive present vegetation:* Torrey quailbush, basin wildrye, black greasewood

#### Inclusion 2

*Position on landscape:* Alluvial flats and interdune flats

*Contrasting features:* Water table at a depth of more than 72 inches

*Distinctive present vegetation:* Shadscale, black greasewood, Cooper wolfberry

### Inclusion 3

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Sandy throughout the profile, water table at a depth of more than 72 inches  
*Distinctive present vegetation:* Indian ricegrass, black greasewood, seepweed

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Wabuska Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Range seeding:* Poor—excess salt, excess sodium

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—frost action

*Roadfill:* Fair—wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess salt, excess sodium, piping

### Interpretive Groups

*Capability classification:* Wabuska soil—VIIw, nonirrigated; Playas—VIIIw

*Range site:* Wabuska soil—027X005N

## 1151—Gynelle very gravelly loamy sand, sodic, 0 to 4 percent slopes

### Map Unit Setting

*Position on landscape:* Fan skirts  
*Elevation:* 4,100 to 4,700 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Gynelle very gravelly loamy sand, sodic, 0 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Oricto very cobbly fine sandy loam, sodic, 0 to 4 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Wabuska loamy sand, 0 to 2 percent slopes (Aeric Halaquepts, coarse-loamy, mixed [calcareous], mesic)—4 percent
- Inclusion 3: Isolde fine sand, warm, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent

### **Characteristics of the Gynelle Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, Cooper wolfberry, shadscale

### **Typical Profile**

0 to 2 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

2 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Nonburied remnants of fan piedmonts

*Contrasting features:* Layer of clay accumulation

#### **Inclusion 2**

*Position on landscape:* Margins of lake plains

*Contrasting features:* Less than 15 percent rock fragments throughout the profile, water table within a depth of 42 inches

*Distinctive present vegetation:* Black greasewood, seepweed

#### **Inclusion 3**

*Position on landscape:* Semistabilized sand dunes

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Gynelle Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, seepage

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Range site:* 027X036N

## **1153—Gynelle gravelly loamy sand, 2 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,200 to 4,600 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Gynelle gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Cirac gravelly sandy loam, 2 to 4 percent slopes (Typic Torrifluents, coarse-loamy, mixed [calcareous], mesic)—6 percent

- Inclusion 2: Izo very gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Oricto very gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—4 percent

### **Characteristics of the Gynelle Soil**

*Position on landscape:* Fan skirts

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Indian ricegrass, shadscale, Cooper wolfberry

### **Typical Profile**

0 to 3 inches—gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Fan aprons and lower parts of fan skirts

*Contrasting features:* Less than 35 percent rock

fragments throughout the profile, occasionally flooded

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Slightly higher nonburied fan piedmont remnants

*Contrasting features:* Layer of clay accumulation, vesicular surface to 5 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Gynelle Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Range site:* 027X043N

## **1155—Gynelle-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and fan skirts

*Elevation:* 4,000 to 5,200 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 140 days

### **Composition**

*Major components:*

- Gynelle very gravelly loamy sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—50 percent
- Izo extremely gravelly loamy sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Gynelle stony fine sandy loam, 4 to 8

percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Izo very stony loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Oricto very gravelly very fine sandy loam, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—2 percent

- Inclusion 4: Gynelle very gravelly loamy sand, 8 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Gynelle Soil**

*Position on landscape:* Slightly higher fan skirts and low-relief fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Cooper wolfberry, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

2 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels and fan aprons

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly concave to slightly convex

*Dominant present vegetation:* Burrobrush, Bailey greasewood, littleleaf horsebrush

### **Typical Profile**

0 to 3 inches—extremely gravelly loamy sand; 0 to 15 percent cobbles and stones, 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1

3 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Highly dissected fan piedmont remnants and fan skirts

*Contrasting features:* .01 to 3 percent stones on the surface

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* 3 to 15 percent stones on the surface

**Inclusion 3**

*Position on landscape:* Higher fan piedmont remnants and nonburied fan piedmont remnants

*Contrasting features:* Layer of clay accumulation, lower water-supplying capacity

**Inclusion 4**

*Position on landscape:* Fan collars

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Slopes of more than 8 percent

**Other inclusions (in only a few areas):** Typic

Haplaquolls

*Position on landscape:* Seep areas at Sodaville seep

*Distinctive present vegetation:* Alkali sacaton, inland saltgrass, Baltic rush, basin wildrye, alkali cordgrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Gynelle Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, large stones

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Gynelle soil—VII<sub>s</sub>, nonirrigated; Izo soil—VII<sub>w</sub>, nonirrigated

*Range site:* Gynelle soil—027X043N; Izo soil—029X041N

**1156—Gynelle-Izo association, strongly sloping****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,000 to 5,600 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Gynelle loamy sand, overblown, 8 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—60 percent

- Izo very gravelly sand, 8 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Izo loamy sand, overblown, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—9 percent

- Inclusion 2: Gynelle loamy sand, overblown, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent

**Characteristics of the Gynelle Soil**

*Position on landscape:* Fan piedmont remnants with sand sheets

*Parent material:* Mixed alluvium with a cap of sandy eolian material

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, Cooper wolfberry

**Typical Profile**

0 to 3 inches—loamy sand; 5 to 20 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Burrobrush, littleleaf horsebrush, Bailey greasewood, Indian ricegrass

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1  
 8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels with sand sheets

*Contrasting features:* Slopes of less than 8 percent

#### **Inclusion 2**

*Position on landscape:* Toe slopes of alluvial fans  
*Slope features:* Length—short; shape—slightly convex  
*Contrasting features:* Slopes of less than 8 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Gynelle Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope, flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Gynelle soil—VIIs, nonirrigated; Izo soil—VIIw, nonirrigated  
*Range site:* Gynelle soil—027X060N; Izo soil—029X041N

## **1171—Hawsley-Theon association**

### **Map Unit Setting**

*Position on landscape:* Sand sheets and hills  
*Elevation:* 4,400 to 4,800 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 55 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Hawsley loamy sand, 4 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—60 percent
- Theon very gravelly sandy loam, 8 to 15 percent

slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Haplargids, gravelly sandy loam, 4 to 8 percent slopes (Typic Haplargids, coarse-loamy, mixed, mesic, shallow)—10 percent
- Inclusion 2: Gynelle very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Bluewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Hawsley Soil**

*Position on landscape:* Sand sheets

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood, Nevada dalea

### **Typical Profile**

0 to 8 inches—loamy sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Theon Soil**

*Position on landscape:* Hills

*Parent material:* Kind—residuum; source—rhyolitic tuff, andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-1, A-2

2 to 11 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Low hills

*Contrasting features:* Soft rock within a depth of 20 inches

**Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* More than 35 percent rock fragments throughout the profile, bedrock at a depth of more than 60 inches, no layer of clay accumulation

*Distinctive present vegetation:* Bailey greasewood, Cooper wolfberry

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Frequently flooded, more than 35 percent rock fragments throughout the profile, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

**Ratings of the Theon Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Hawsley soil—IVs, irrigated, and VIIs, nonirrigated; Theon soil—VIIs, nonirrigated

*Range site:* Hawsley soil—027X009N; Theon soil—027X019N

**1172—Hawsley sand, 0 to 4 percent slopes****Map Unit Setting**

*Position on landscape:* Sand sheets

*Elevation:* 4,300 to 5,000 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Hawsley sand, 0 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Eastgate gravelly loamy sand, 0 to 4 percent slopes (Typic Camborthids, sandy, mixed, mesic)—5 percent

- Inclusion 2: Isolde fine sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent

**Characteristics of the Hawsley Soil**

*Position on landscape:* Sand sheets

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, Bailey greasewood, Nevada dalea

**Typical Profile**

0 to 8 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Sand sheets over inset fans  
*Contrasting features:* More than 35 percent rock fragments between depths of 30 and 60 inches, sandy loam layer at a depth of 5 to 15 inches

#### **Inclusion 2**

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Fine sand throughout the profile, more unstable surface  
*Distinctive present vegetation:* Hairy horsebrush, fourwing saltbush, Indian ricegrass

### **Major Uses**

**Current uses:** Wildlife habitat, rangeland  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, soil blowing, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### **Interpretive Groups**

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 027X009N

## **1173—Hawsley-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,000 to 5,800 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Hawsley sand, 2 to 4 percent slopes (Typic Torripsammets, mixed, mesic)—60 percent
- Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—25 percent

#### *Contrasting inclusions:*

- Inclusion 1: Stumble loamy sand, 2 to 4 percent slopes (Typic Torripsammets, mixed, mesic)—9 percent
- Inclusion 2: Wardenot very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent

### **Characteristics of the Hawsley Soil**

*Position on landscape:* Sand sheets over inset fan remnants

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, Bailey greasewood, Nevada dalea

### **Typical Profile**

0 to 8 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Izo Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Burrobrush, rabbitbrush, littleleaf horsebrush, spiny hopsage

**Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1  
 8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Remnants of inset fans  
*Contrasting features:* Gravelly strata at a depth of more than 10 inches, less than 35 percent rock fragments between depths of 10 and 40 inches

**Inclusion 2**

*Position on landscape:* Fanlettes  
*Slope features:* Length—short; shape—slightly convex  
*Contrasting features:* More than 35 percent rock fragments throughout the profile, rarely flooded  
*Distinctive present vegetation:* Bailey greasewood, galleta, Indian ricegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

**Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Hawsley soil—IVs, irrigated,

and VII<sub>s</sub>, nonirrigated; Izo soil—VII<sub>w</sub>, nonirrigated  
*Range site:* Hawsley soil—027X009N; Izo soil—  
 029X041N

## 1174—Hawsley-Typic Torriorthents association

### Map Unit Setting

*Position on landscape:* Lake-plain terraces

*Elevation:* 4,200 to 4,500 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

### Composition

*Major components:*

- Hawsley sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—55 percent
- Typic Torriorthents, gravelly loamy sand, warm, 8 to 30 percent slopes—30 percent

*Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—6 percent
- Inclusion 2: Luning sandy loam, 2 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—4 percent
- Inclusion 3: Bluewing very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Hawsley sand, 8 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent

### Characteristics of the Hawsley Soil

*Position on landscape:* Sand sheets

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, Bailey greasewood, Nevada dalea

### Typical Profile

0 to 8 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM;

estimated AASHTO classification—A-2, A-3  
 42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Typic Torriorthents

*Position on landscape:* Dissected lake-plain terraces

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex to slightly concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry, Indian ricegrass

### Reference Profile

0 to 6 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Fine sand throughout the profile  
*Distinctive present vegetation:* Indian ricegrass, hairy horsebrush

#### **Inclusion 2**

*Position on landscape:* Inset fans  
*Slope features:* Length—short; shape—smooth  
*Contrasting features:* Sandy textures throughout the profile, very gravelly strata within a depth of 40 inches

#### **Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* More than 35 percent rock fragments throughout the profile, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Steeper sand sheets  
*Contrasting features:* Slopes of more than 8 percent, sandy throughout the profile

**Other inclusions (in only a few areas):** Badland

*Position on landscape:* Areas of exposed semiconsolidated lacustrine sediments on side slopes of lake-plain terraces  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—piping, seepage

### **Ratings of the Typic Torriorthents for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, small stones, too sandy  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Hawsley soil—IVs, irrigated, and VIIs, nonirrigated; Typic Torriorthents—VIIe, nonirrigated

*Range site:* Hawsley soil—027X009N; Typic Torriorthents soil—027X043N

## **1180—Buckaroo-Bluewing association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,400 to 5,200 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Buckaroo stony fine sandy loam, 4 to 15 percent slopes (Typic Natrargids, fine, montmorillonitic, mesic)—70 percent
- Bluewing stony loamy sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Bluewing very cobbly loamy sand, frequently flooded, 2 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Duric Natrargids, stony sandy loam, 8 to 30 percent slopes (Duric Natrargids, fine-loamy, mixed, mesic)—5 percent
- Inclusion 3: Typic Nadurargids, stony fine sandy loam,

8 to 30 percent slopes (Typic Nadurargids, fine, montmorillonitic, mesic)—3 percent  
 • Inclusion 4: Hawsley loamy sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent

### **Characteristics of the Buckaroo Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, bud sagebrush, Indian ricegrass

*Percent of surface covered by rock fragments:* 45 percent pebbles, 10 percent cobbles, 2 percent stones

### **Typical Profile**

0 to 4 inches—stony fine sandy loam; 5 to 15 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-4, A-2

4 to 18 inches—clay loam, clay; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); prismatic structure; very hard, friable; strongly alkaline (pH 8.7); moderately saline (8 to 16 mmhos/cm); moderately sodic to strongly sodic (SAR 35 to 80); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

18 to 60 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 55 to 70 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Bluewing Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

*Percent of surface covered by rock fragments:* 3 percent stones

### **Typical Profile**

0 to 7 inches—stony loamy sand; 5 to 15 percent cobbles and stones, 65 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

7 to 60 inches—stratified very gravelly coarse sand to extremely gravelly loamy sand; 15 to 25 percent cobbles and stones, 65 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Very rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, frequently flooded

*Distinctive present vegetation:* Burrobrush, Indian ricegrass, Bailey greasewood

#### **Inclusion 2**

*Position on landscape:* Side slopes and shoulder slopes of fan piedmont remnants

*Contrasting features:* Layer of weak silica accumulation

*Distinctive present vegetation:* Spiny menodora, Bailey greasewood, galleta

#### **Inclusion 3**

*Position on landscape:* Higher summits of fan piedmont remnants

*Contrasting features:* Duripan in the upper 40 inches

#### **Inclusion 4**

*Position on landscape:* Sand sheets

*Contrasting features:* No layer of clay accumulation, sandy throughout the profile

*Distinctive present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Buckaroo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, excess salt, excess sodium

#### **Ratings of the Bluewing Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Buckaroo soil—VIIs, nonirrigated; Bluewing soil—VIIs, nonirrigated

*Range site:* Buckaroo soil—027X018N; Bluewing soil—027X018N

## **1190—Old Camp-Theon-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Old Camp extremely stony loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—45 percent

- Theon very stony fine sandy loam, 50 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—25 percent

- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Stewval very stony fine sandy loam, 15 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Typic Haplargids, very stony loam, 30 to 75 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Xeric Torriorthents, very gravelly sand, 4 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

### **Characteristics of the Old Camp Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage

*Percent of surface covered by rock fragments:* 15 percent stones

### **Typical Profile**

0 to 2 inches—extremely stony loam; 25 to 55 percent cobbles and stones, 35 to 45 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM, SM, SM-SC; estimated AASHTO classification—A-2, A-4

2 to 14 inches—very cobbly clay loam, extremely stony sandy clay loam, very stony loam; 35 to 50 percent cobbles and stones, 50 to 65 percent pebbles (by

weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Theon Soil

*Position on landscape:* South- and west-facing side slopes of mountains

*Parent material:* Kind—residuum; source—rhyolitic tuff, andesite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Bailey greasewood, shadscale

*Percent of surface covered by rock fragments:* 8 percent stones

### Typical Profile

0 to 2 inches—very stony fine sandy loam; 15 to 55 percent cobbles and stones, 25 to 55 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2, A-4

2 to 11 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 5 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulder slopes and ridge crests of mountains at higher elevations

*Contrasting features:* Slopes of less than 30 percent, bedrock within a depth of 10 inches

*Distinctive present vegetation:* Black sagebrush, pine bluegrass, galleta

#### Inclusion 2

*Position on landscape:* South-facing side slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Desert needlegrass, shadscale

#### Inclusion 3

*Position on landscape:* Channels

*Slope features:* Length—long

*Contrasting features:* Bedrock at a depth of more than 20 inches, frequently flooded

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Old Camp Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones, erodes easily

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, large stones

### **Ratings of the Theon Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Old Camp soil—VIIIs, nonirrigated; Theon soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Old Camp soil—027X007N; Theon soil—027X019N

## **1200—Playas**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,000 to 5,600 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Playas—90 percent

*Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, warm, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent
- Inclusion 2: Wabuska loamy sand, strongly saline-sodic, 2 to 8 percent slopes (Aeric Halaquepts, coarse-loamy, mixed [calcareous], mesic)—3 percent
- Inclusion 3: Aquic Torriorthents, sandy loam, 0 to 2 percent slopes (Aquic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—3 percent

### **Characteristics of the Playas**

*Position on landscape:* Bolson floors

*Slope features:* Length—long; shape—plane

*Dominant present vegetation:* None

*Flooding:* Frequency—frequent; duration—very long; months—January to August

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Semistabilized sand dunes

*Contrasting features:* Sandy textures throughout the profile, nonflooded

*Distinctive present vegetation:* Black greasewood, seepweed, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* Lake plains

*Contrasting features:* Rarely flooded, averages less than 18 percent clay throughout the profile

*Distinctive present vegetation:* Inland saltgrass, black greasewood, seepweed

#### **Inclusion 3**

*Position on landscape:* Lake plains

*Contrasting features:* Rarely flooded, averages less than 18 percent clay throughout the profile

*Distinctive present vegetation:* Black greasewood, inland saltgrass, seepweed, shadscale

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Interpretive Groups**

*Capability classification:* VIIIw, nonirrigated

## **1201—Playas-Slaw association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,200 to 5,600 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Playas—60 percent
- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluents, fine-silty, mixed [calcareous], mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, warm, 2 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—7 percent

- Inclusion 2: Cirac fine sandy loam, 0 to 2 percent slopes (Typic Torrfluvents, coarse-loamy, mixed [calcareous], mesic)—3 percent

### **Characteristics of the Playas**

*Position on landscape:* Flood-plain playas  
*Slope features:* Length—long; shape—plane  
*Dominant present vegetation:* None  
*Flooding:* Frequency—frequent; duration—very long; months—February to August

### **Characteristics of the Slaw Soil**

*Position on landscape:* Alluvial flats  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, seepweed, shadscale

### **Typical Profile**

- 0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 9 to 48 inches—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7
- 48 to 60 inches—sandy loam, fine sandy loam, sandy clay loam; 0 to 5 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SC, SM; estimated AASHTO classification—A-4, A-2, A-6

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief to brief; months—April to August  
*Permeability:* Slow  
*Available water capacity:* About 10 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Poned  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Sandy throughout the profile

#### **Inclusion 2**

*Position on landscape:* Higher alluvial flats  
*Slope features:* Length—short; shape—smooth  
*Contrasting features:* Less than 18 percent clay between depths of 10 and 40 inches, strata containing up to 35 percent pebbles  
*Distinctive present vegetation:* Cooper wolfberry

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Slaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, excess salt, excess sodium  
*Shallow excavations:* Moderate—flooding, too clayey  
*Local roads and streets:* Severe—flooding, low strength  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—excess salt

### **Interpretive Groups**

*Capability classification:* Playas—VIIIw; Slaw soil—VIIw, nonirrigated  
*Range site:* Slaw soil—027X025N

## **1202—Dumps-Pits association**

### **Map Unit Setting**

*Position on landscape:* Areas disturbed by mining activities on various landscapes  
*Elevation:* 5,400 to 8,000 feet  
*Average annual precipitation:* About 5 to 12 inches  
*Average annual air temperature:* About 47 to 54 degrees F  
*Frost-free season:* About 80 to 130 days

### **Composition**

*Major components:*

- Dumps—50 percent
- Pits—50 percent

**Characteristics of the Dumps**

*Position on landscape:* Areas disturbed by mining activities on various landscapes

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* None

**Characteristics of the Pits**

*Position on landscape:* Areas disturbed by mining activities on various landscapes

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* None

**Major Uses**

**Current uses:** Mining

**Interpretive Groups**

*Capability classification:* Dumps—VIIIs; Pits—VIIIs

**1205—Badland****Map Unit Setting**

*Position on landscape:* Lake-plain terraces

*Elevation:* 4,200 to 4,500 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 145 days

**Composition**

*Major components:*

- Badland—95 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, cobbly fine sandy loam, 0 to 4 percent slopes—5 percent

**Characteristics of the Badland**

*Position on landscape:* Lake-plain terraces

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* None

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Slightly higher lake-plain terraces

*Contrasting features:* Stratified gravelly loamy sand to silty clay loam at a depth of more than 10 inches

*Distinctive present vegetation:* Shadscale, black greasewood, seepweed

**Major Uses**

**Current uses:** Wildlife habitat

**Interpretive Groups**

*Capability classification:* VIIIs

**1210—Trocken-Bluewing association****Map Unit Setting**

*Position on landscape:* Alluvial fans and inset fans

*Elevation:* 4,500 to 5,500 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Trocken gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—70 percent
- Bluewing very gravelly loamy sand, frequently flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Bluewing gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Rednik gravelly loamy sand, 2 to 8 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—4 percent

**Characteristics of the Trocken Soil**

*Position on landscape:* Alluvial fans and remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

**Typical Profile**

- 0 to 3 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure parting to platy; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 3 to 60 inches—stratified gravelly loam to extremely gravelly loamy coarse sand; 0 to 15 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Bluewing Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood, burrobrush

### **Typical Profile**

0 to 7 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones, 55 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1  
 7 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief; months—November to September  
*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower remnants of inset fans  
*Contrasting features:* Rarely flooded

#### **Inclusion 2**

*Position on landscape:* Slightly higher fan piedmont remnants and nonburied fan piedmont remnants  
*Contrasting features:* Layer of clay accumulation

#### **Other inclusions (in only a few areas)**

- Theon very gravelly sandy loam, 8 to 15 percent slopes

*Position on landscape:* Adjacent to rock outcrop

*Distinctive present vegetation:* Curlleaf mountainmahogany, bluebunch wheatgrass, pine bluegrass

- Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic

*Position on landscape:* Small areas adjacent to Lyon County line

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Trocken Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Bluewing Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too sandy, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Trocken soil—VIIs, nonirrigated; Bluewing soil—VIIw, nonirrigated

*Range site:* Trocken soil—027X018N; Bluewing soil—027X022N

## 1221—Eastgate gravelly sandy loam, 0 to 4 percent slopes

### Map Unit Setting

*Position on landscape:* Fan skirts and inset fan remnants

*Elevation:* 4,000 to 4,500 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Eastgate gravelly sandy loam, 0 to 4 percent slopes (Typic Camborthids, sandy, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Cirac gravelly sandy loam, ponded, 0 to 4 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—8 percent

- Inclusion 2: Oricto gravelly sandy loam, 2 to 4 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Eastgate loamy sand, 0 to 4 percent slopes (Typic Camborthids, sandy, mixed, mesic)—2 percent

### Characteristics of the Eastgate Soil

*Position on landscape:* Fan skirts and inset fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bailey greasewood, shadscale, Cooper wolfberry, Indian ricegrass

### Typical Profile

0 to 6 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 40 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 14 inches—gravelly sandy loam, sandy loam; 10 to 30 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

14 to 31 inches—gravelly loamy sand, loamy sand; 10 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than

4); estimated Unified classification—SM; estimated AASHTO classification—A-1

31 to 60 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Margins of fan skirts and upper parts of alluvial flats

*Contrasting features:* More clay throughout the profile, occasionally flooded

#### Inclusion 2

*Position on landscape:* Summits of fan piedmont remnants

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* Layer of clay accumulation, vesicular surface

*Distinctive present vegetation:* Shadscale, Cooper wolfberry

#### Inclusion 3

*Position on landscape:* Sand sheets over fan skirts

*Contrasting features:* Sandy surface

*Distinctive present vegetation:* Cooper wolfberry, Indian ricegrass, Nevada dalea, littleleaf horsebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Eastgate Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid

*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated  
*Range site:* 027X043N

## **1223—Eastgate-Cirac association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,200 to 4,400 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Eastgate gravelly loamy sand, 0 to 2 percent slopes (Typic Camborthids, sandy, mixed, mesic)—45 percent
- Cirac fine sandy loam, ponded, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, warm, 4 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—6 percent
- Inclusion 2: Luning gravelly loamy fine sand, gravelly substratum, 0 to 2 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—6 percent
- Inclusion 3: Typic Torriorthents, fine sandy loam, 0 to 2 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—3 percent

### **Characteristics of the Eastgate Soil**

*Position on landscape:* Sand sheets over fan piedmont remnants  
*Parent material:* Mixed alluvium with a cap of sandy eolian material  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Bailey greasewood, Cooper wolfberry, Indian ricegrass

### **Typical Profile**

0 to 5 inches—gravelly loamy sand; 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4);

estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 17 inches—gravelly sandy loam, sandy loam; 10 to 30 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

17 to 25 inches—gravelly loamy sand, loamy sand; 10 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1

25 to 60 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Cirac Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Black greasewood, seepweed, shadscale

### **Typical Profile**

0 to 5 inches—fine sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

5 to 60 inches—stratified gravelly sand to silt loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—February to September  
*Permeability:* Moderately rapid  
*Available water capacity:* About 7 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Sandy throughout the profile, slopes of more than 4 percent  
*Distinctive present vegetation:* Black greasewood, Indian ricegrass

#### Inclusion 2

*Position on landscape:* Higher inset fans with sand sheets

*Contrasting features:* Sandy in the upper 30 inches

#### Inclusion 3

*Position on landscape:* Inset fans  
*Contrasting features:* Rarely flooded, 10 to 18 percent clay between depths of 10 and 40 inches  
*Distinctive present vegetation:* Bailey greasewood, Cooper wolfberry, shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Eastgate Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too sandy, soil blowing  
*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Cirac Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* Eastgate soil—VIIIs, nonirrigated; Cirac soil—IIIw, irrigated, and VIIw, nonirrigated

*Range site:* Eastgate soil—027X060N; Cirac soil—027X025N

## 1240—Blacktop-Downeyville-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Mountains and hills

*Elevation:* 4,200 to 6,000 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Blacktop very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—40 percent
- Downeyville very gravelly sandy loam, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—35 percent
- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly loamy sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 2: Typic Torriorthents, very stony sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—4 percent
- Inclusion 3: Xeric Torriorthents, very gravelly sandy loam, 30 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—4 percent
- Inclusion 4: Unsel very gravelly loam, 4 to 15 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—3 percent

### **Characteristics of the Blacktop Soil**

*Position on landscape:* Side slopes of mountains and hills

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass, Indian ricegrass

### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

4 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Downeyville Soil**

*Position on landscape:* Crests of ridges and shoulder slopes of mountains and hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

### **Typical Profile**

0 to 5 inches—very gravelly sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-2, A-1

5 to 14 inches—very gravelly loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* North-facing side slopes of mountains

*Slope features:* Shape—concave

*Contrasting features:* Higher water-supplying capacity, soft bedrock within a depth of 20 inches

*Distinctive present vegetation:* Bailey greasewood, pine bluegrass, Sandberg bluegrass

**Inclusion 3**

*Position on landscape:* North-facing side slopes of mountains at higher elevations

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

**Inclusion 4**

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Bedrock at a depth of more than 60 inches

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Blacktop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Downeyville Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—slope, depth to bedrock

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—slope, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Blacktop soil—VIIIs, nonirrigated; Downeyville soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Blacktop soil—029X033N; Downeyville soil—029X022N

**1241—Blacktop-Rock outcrop association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 4,200 to 6,000 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Blacktop very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—65 percent

- Rock outcrop—25 percent

*Contrasting inclusions:*

- Inclusion 1: Downeyville very gravelly sandy loam, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Tejabe very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—3 percent

- Inclusion 3: Izo very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Blacktop Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—long to short; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass, Indian ricegrass

**Typical Profile**

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Crests of ridges and shoulder slopes of mountains

*Slope features:* Shape—convex

*Contrasting features:* Layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

##### **Inclusion 2**

*Position on landscape:* North-facing side slopes of mountains at higher elevations

*Slope features:* Shape—convex to concave

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

##### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Blacktop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Blacktop soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Blacktop soil—029X033N

## **1243—Blacktop-Rodad-Theriot association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Blacktop very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—40 percent

- Rodad very cobbly loam, 30 to 50 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic, shallow)—25 percent

- Theriot very gravelly sandy loam, 30 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent

- Inclusion 2: Izo very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 3: Typic Torriorthents, very gravelly sandy loam, 15 to 50 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

- Inclusion 4: Xeric Torriorthents, very gravelly sandy loam, 30 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent

### **Characteristics of the Blacktop Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass

#### **Typical Profile**

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Rodad Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—shale  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Galleta, Indian ricegrass, desert needlegrass, shadscale, spiny menodora, Nevada ephedra

### **Typical Profile**

0 to 4 inches—very cobbly loam; 25 to 40 percent cobbles and stones, 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2  
 4 to 12 inches—very gravelly clay loam, very channery clay loam; 0 to 15 percent cobbles and stones, 45 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7  
 12 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Theriot Soil**

*Position on landscape:* Side slopes of mountains  
*Parent material:* Kind—colluvium and residuum; source—limestone and dolomite  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Galleta, Indian ricegrass, desert needlegrass, shadscale, spiny menodora

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 15 to 35 percent cobbles and stones, 40 to 60 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2  
 3 to 14 inches—very stony loam, very cobbly loam, very gravelly sandy loam; 20 to 55 percent cobbles and stones, 25 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4  
 14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Burrobrush, rabbitbrush

### **Inclusion 3**

*Position on landscape:* Toe slopes of hills and concave slide areas

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Spiny menodora, galleta

### **Inclusion 4**

*Position on landscape:* North-facing side slopes of mountains at upper elevations

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, galleta

## **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Blacktop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Rodad Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Theriot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope, large stones

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, slope, large stones

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—thin layer, large stones, seepage

## **Interpretive Groups**

*Capability classification:* Blacktop soil—VIIIs, nonirrigated; Rodad soil—VIIIs, nonirrigated; Theriot soil—VIIIs, nonirrigated

*Range site:* Blacktop soil—029X033N; Rodad soil—029X022N; Theriot soil—029X022N

## **1280—Chill-Petspring association**

### **Map Unit Setting**

*Position on landscape:* Rock pediments

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Chill gravelly sandy loam, 8 to 30 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—55 percent

- Petspring very gravelly coarse sandy loam, 15 to 30 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent

- Inclusion 2: Budihol gravelly sandy loam, 30 to 50 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—5 percent

- Inclusion 3: Xeric Torriorthents, gravelly sandy loam, 4 to 15 percent slopes (Xeric Torriorthents, coarse-loamy, mixed, mesic)—4 percent

- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—1 percent

### **Characteristics of the Chill Soil**

*Position on landscape:* Summits and north-facing side slopes of rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage, Indian ricegrass

### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

4 to 7 inches—gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

7 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Petspring Soil

*Position on landscape:* South-facing side slopes of rock pediment remnants

*Parent material:* Kind—colluvium and residuum; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

### Typical Profile

0 to 1 inch—very gravelly coarse sandy loam; 0 to 20 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Rounded knobs

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* North-facing side slopes of rock pediments

*Slope features:* Length—very short; shape—convex to concave

*Contrasting features:* Slopes of more than 30 percent

#### Inclusion 3

*Position on landscape:* Inset fans

*Contrasting features:* Bedrock at a depth of more than 60 inches

#### Inclusion 4

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Chill Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—depth to bedrock, droughty

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Petspring Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Chill soil—VII<sub>s</sub>, nonirrigated; Petspring soil—VII<sub>s</sub>, nonirrigated  
*Range site:* Chill soil—027X008N; Petspring soil—027X065N

## 1281—Chill-Beelem-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Hills and rock pediments  
*Elevation:* 6,200 to 7,200 feet  
*Average annual precipitation:* About 10 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 115 days

### Composition

*Major components:*

- Chill gravelly sandy loam, 8 to 30 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—45 percent
- Beelem gravelly sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—30 percent
- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—8 percent
- Inclusion 2: Armoine gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—3 percent
- Inclusion 3: Budihol very stony sandy loam, 30 to 50 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—4 percent

### Characteristics of the Chill Soil

*Position on landscape:* Hills and rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, spiny hopsage, Indian ricegrass

### Typical Profile

0 to 3 inches—gravelly sandy loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

7 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Beelem Soil

*Position on landscape:* More eroded side slopes of hills and rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rocks

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Utah juniper, Wyoming big sagebrush, Sandberg bluegrass

### Typical Profile

0 to 1 inch—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very

friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered rounded knobs

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fans

*Contrasting features:* Bedrock at a depth of more than 20 inches

#### Inclusion 2

*Position on landscape:* Crests and shoulder slopes of hills

*Contrasting features:* More than 35 percent rock fragments throughout the profile, calcareous throughout the profile

*Distinctive present vegetation:* Black sagebrush, pine bluegrass, galleta

#### Inclusion 3

*Position on landscape:* North-facing side slopes of hills and rock pediments

*Contrasting features:* No layer of clay accumulation, soft bedrock within a depth of 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

### Woodland

*Site index for Utah juniper:* Beelem—30

*Major native understory plants:* Beelem—Wyoming big sagebrush, black sagebrush, Nevada ephedra, Indian ricegrass, bottlebrush squirreltail

### Ratings of the Chill Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—depth to bedrock, droughty

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Beelem Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Chill soil—VIIs, nonirrigated; Beelem soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Chill soil—027X008N

*Woodland suitability group:* Beelem soil—1R

## 1282—Chill-Veet association

### Map Unit Setting

*Position on landscape:* Rock pediment remnants and inset fans

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### Composition

#### Major components:

- Chill gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—60 percent
- Veet gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—30 percent

#### Contrasting inclusions:

- Inclusion 1: Armoine gravelly sandy loam, 2 to 8 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—7 percent
- Inclusion 2: Rock outcrop—2 percent
- Inclusion 3: Armespan very gravelly sandy loam, 2 to 8 percent slopes (Durixerollic Calciorthisds, loamy-skeletal, mixed, mesic)—1 percent

### Characteristics of the Chill Soil

*Position on landscape:* Rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, spiny hopsage, Indian ricegrass

### Typical Profile

0 to 3 inches—gravelly sandy loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

7 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Veet Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### Typical Profile

0 to 5 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Rock pediment remnants

*Slope features:* Length—short; shape—convex  
*Contrasting features:* Calcareous throughout the profile  
*Distinctive present vegetation:* Black sagebrush, pine bluegrass, galleta

**Inclusion 2**

*Position on landscape:* Rounded knobs on rock pediment remnants

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

**Inclusion 3**

*Position on landscape:* Lower summits of fan piedmont remnants

*Contrasting features:* Layer of weak silica accumulation

*Distinctive present vegetation:* Black sagebrush, galleta

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Chill Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—depth to bedrock, droughty

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—depth to bedrock, slope, frost action

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Fair—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Chill soil—VIIs, nonirrigated; Veet soil—VIIs, nonirrigated

*Range site:* Chill soil—027X008N; Veet soil—029X049N

**1283—Chill-Itme association****Map Unit Setting**

*Position on landscape:* Rock pediment remnants and overlaid alluvial fans

*Elevation:* 5,400 to 6,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Chill gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—60 percent

- Itme very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

**Characteristics of the Chill Soil**

*Position on landscape:* Rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage, Indian ricegrass

**Typical Profile**

0 to 3 inches—gravelly sandy loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

7 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Itme Soil**

*Position on landscape:* Alluvial fans overlapped on rock pediments  
*Parent material:* Kind—alluvium; source—granitic rock and rhyolitic tuff  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Spiny hopsage, Anderson wolfberry, shadscale, Indian ricegrass, galleta

### **Typical Profile**

0 to 6 inches—very gravelly sand; 0 to 5 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SP; estimated AASHTO classification—A-1  
 6 to 60 inches—very gravelly loamy sand, very gravelly sand; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SP, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high, concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush, burrobrush, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Chill Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—depth to bedrock, droughty  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Moderate—depth to bedrock, slope, frost action  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Itme Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope, flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Chill soil—VIIIs, nonirrigated; Itme soil—VII, nonirrigated  
*Range site:* Chill soil—027X008N; Itme soil—029X016N

## **1290—Petspring-Rock outcrop-Budihol association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,000 to 7,000 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 115 days

### **Composition**

#### **Major components:**

- Petspring very gravelly coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—45 percent
  - Rock outcrop—25 percent
  - Budihol gravelly sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—20 percent
- Contrasting inclusions:*
- Inclusion 1: Chill gravelly sandy loam, 4 to 30 percent

- slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—5 percent
- Inclusion 2: Petspring very gravelly coarse sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—4 percent
  - Inclusion 3: Xeric Torriorthents, very gravelly loamy coarse sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—1 percent

### **Characteristics of the Petspring Soil**

*Position on landscape:* South-, west-, and east-facing side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

### **Typical Profile**

0 to 1 inch—very gravelly coarse sandy loam; 0 to 20 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 10 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Characteristics of the Budihol Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, Nevada ephedra

### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 10 inches—gravelly coarse sandy loam, gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

10 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and shoulder slopes of ridges

*Contrasting features:* Layer of clay accumulation

### **Inclusion 2**

*Position on landscape:* South-facing side slopes of mountains and shoulder slopes of ridges

*Contrasting features:* Slopes of less than 50 percent

### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Slopes of less than 15 percent, occasionally flooded, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

## **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Petspring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Budihol Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

## **Interpretive Groups**

*Capability classification:* Petspring soil—VIIs, nonirrigated; Rock outcrop—VIIIs; Budihol soil—VIIs, nonirrigated

*Range site:* Petspring soil—027X065N; Budihol soil—027X007N

## **1291—Petspring-Uripnes-Beelem association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,600 to 7,200 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

## **Composition**

*Major components:*

- Petspring very gravelly coarse sandy loam, 30 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—50 percent

- Uripnes very gravelly sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—20 percent

- Beelem very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent

- Inclusion 2: Budihol extremely bouldery sandy loam, 30 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—4 percent

- Inclusion 3: Crunkvar very gravelly loamy coarse sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Armoine very gravelly sandy loam, 8 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—1 percent

## **Characteristics of the Petspring Soil**

*Position on landscape:* East- and west-facing side slopes of mountains and south-facing side slopes at upper elevations

*Parent material:* Kind—colluvium and residuum; source—granitic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

## **Typical Profile**

0 to 1 inch—very gravelly coarse sandy loam; 0 to 20 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—SM; estimated AASHTO classification—A-1

3 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 3 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

#### **Characteristics of the Uripnes Soil**

*Position on landscape:* South-facing side slopes of mountains at lower elevations

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass

#### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 3 to 8 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Beelem Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rocks

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Utah juniper, singleleaf pinyon, Wyoming big sagebrush

#### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* North-facing side slopes of mountains

*Contrasting features:* Higher water-supplying capacity, less than 35 percent rock fragments throughout the profile, hard bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, pine sagebrush

#### **Inclusion 3**

*Position on landscape:* Fanettes

*Contrasting features:* Slopes of less than 15 percent, sandy textures throughout the profile, bedrock at a depth of more than 60 inches

#### **Inclusion 4**

*Position on landscape:* Ridges and shoulder slopes

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Layer of clay accumulation, slopes of less than 30 percent

*Distinctive present vegetation:* Black sagebrush, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

#### **Woodland**

*Site index for common trees on the Beelem soil:*

Singleleaf pinyon—30; Utah juniper—30

*Major native understory plants:* Beelem—Wyoming big sagebrush, black sagebrush

#### **Ratings of the Petspring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Uripnes Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Beelem Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Petspring soil—VII<sub>s</sub>, nonirrigated; Uripnes soil—VII<sub>s</sub>, nonirrigated; Beelem soil—VII<sub>s</sub>, nonirrigated

*Range site:* Petspring soil—027X065N; Uripnes soil—27X047N

*Woodland suitability group:* Beelem soil—1R

## **1301—Sundown loamy sand, 2 to 8 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Sand sheets

*Elevation:* 4,300 to 5,300 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 145 days

### **Composition**

*Major components:*

- Sundown loamy sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Luning loamy sand, gravelly substratum, 2 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—8 percent

- Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Sundown fine sand, 8 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent

### **Characteristics of the Sundown Soil**

*Position on landscape:* Sand sheets over fan piedmonts

*Parent material:* Kind—alluvium and eolian material;  
source—various kinds of rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, Russian-thistle, fourwing saltbush

### Typical Profile

0 to 3 inches—loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 60 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fans with sand sheets

*Contrasting features:* Very gravelly at a depth of more than 30 inches

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* More than 35 percent rock fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Burrobrush, Indian ricegrass, littleleaf horsebrush

#### Inclusion 3

*Position on landscape:* Higher elevation sand sheets over fan piedmonts

*Contrasting features:* Slopes of more than 8 percent

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Sundown Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, seepage

### Interpretive Groups

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 027X060N

## 1310—Typic Torriorthents-Gynelle-Oricto association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 4,400 to 5,400 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 145 days

### Composition

*Major components:*

- Typic Torriorthents, very gravelly loamy sand, 8 to 30 percent slopes—50 percent

- Gynelle very gravelly loamy sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

- Oricto very gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Izo extremely gravelly sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—8 percent

- Inclusion 2: Badland—4 percent

- Inclusion 3: Izo extremely stony loamy sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Typic Torriorthents**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### **Reference Profile**

0 to 6 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Gynelle Soil**

*Position on landscape:* Inset fans and inset fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Cooper wolfberry, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

2 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Oricto Soil**

*Position on landscape:* Highest summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.5); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 to 8 inches—very gravelly loam, very gravelly sandy

clay loam; 5 to 30 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2

8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 9.6); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Burrobrush, littleleaf horsebrush

#### Inclusion 2

*Position on landscape:* Areas of exposed lake sediments on side slopes of fan piedmont remnants  
*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Channels  
*Contrasting features:* More than 15 percent stones on the surface, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, littleleaf horsebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Typic Torriorthents for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Gynelle Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, large stones

#### Ratings of the Oricto Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

### Interpretive Groups

*Capability classification:* Typic Torriorthents—VIIIs, nonirrigated; Gynelle soil—VIIIs, nonirrigated; Oricto soil—VIIIs, nonirrigated  
*Range site:* Typic Torriorthents—029X033N; Gynelle soil—027X043N; Oricto soil—029X032N

## 1320—Belted-Downeyville association

### Map Unit Setting

*Position on landscape:* Hills and fan piedmonts

*Elevation:* 4,600 to 5,800 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Belted very gravelly loam, moist, 4 to 30 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—65 percent
- Downeyville very gravelly sandy loam, moist, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, gravelly loam, 15 to 50 percent slopes (Typic Torriorthents, loamy, mixed, mesic, shallow)—8 percent
- Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Rock outcrop—2 percent
- Inclusion 4: Downeyville very stony sandy loam, moist, 2 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Belted Soil

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood

### Typical Profile

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified

classification—SC; estimated AASHTO classification—A-6

10 to 34 inches—strongly cemented duripan

34 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Downeyville Soil

*Position on landscape:* Crests and shoulder slopes of hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Shadscale, spiny menodora, galleta

### Typical Profile

0 to 4 inches—very gravelly sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Side slopes of fan piedmont remnants  
*Slope features:* Length—very short; shape—concave  
*Contrasting features:* Soft bedrock within a depth of 20 inches, no layer of clay accumulation

**Inclusion 2**

*Position on landscape:* Channels  
*Contrasting features:* No layer of clay accumulation, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Inclusion 3**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Exposed bedrock  
*Distinctive present vegetation:* None

**Inclusion 4**

*Position on landscape:* Crests and shoulder slopes of hills  
*Contrasting features:* 3 to 15 percent stones on the surface

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Belted Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cemented pan, cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Downeyville Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Belted soil—VIIIs, nonirrigated; Downeyville soil—VIIIs, nonirrigated  
*Range site:* Belted soil—029X036N; Downeyville soil—029X037N

**1322—Belted-Annaw association****Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,800 to 6,300 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Belted very gravelly loam, moist, 4 to 30 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—75 percent
- Annaw gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, gravelly loam, 15 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—7 percent
- Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
- Inclusion 4: Pintwater very gravelly sandy loam, 8 to 30 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Side slopes and summits of fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

#### **Typical Profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 to 34 inches—strongly cemented duripan

34 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Annaw Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, Indian ricegrass

#### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Side slopes of fan piedmont

remnants with abrupt shoulders

*Slope features:* Length—short; shape—concave

*Contrasting features:* Soft bedrock within a depth of 20 inches, no layer of clay accumulation

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 3**

*Position on landscape:* North-facing side slopes of fan piedmont remnants at higher elevations

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

#### **Inclusion 4**

*Position on landscape:* Crests of hills

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Hard bedrock within a depth of 20 inches, no layer of clay accumulation

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Belted Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cemented pan, slope, cutbanks cave

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Annaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Belted soil—VIIIs, nonirrigated; Annaw soil—VIIIs, nonirrigated

*Range site:* Belted soil—029X036N; Annaw soil—029X036N

## **1323—Belted-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,800 to 6,100 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Belted very gravelly loam, moist, 2 to 8 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—75 percent
- Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Duric Camborthids, gravelly sandy loam, 2 to 4 percent slopes (Duric Camborthids, coarse-loamy, mixed, mesic)—5 percent
- Inclusion 2: Annaw gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Xerollic Camborthids, very gravelly sandy loam, 2 to 4 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—1 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

### **Typical Profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified

classification—SC; estimated AASHTO classification—A-6

10 to 34 inches—strongly cemented duripan

34 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Indian ricegrass, spiny hopsage, burrobrush, rubber rabbitbrush

### Typical Profile

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan aprons

*Contrasting features:* Less than 35 percent rock fragments throughout the profile, rarely flooded, no layer of clay accumulation

#### Inclusion 2

*Position on landscape:* Remnants of inset fans

*Contrasting features:* No layer of clay accumulation, layer of silica cementation, rarely flooded

#### Inclusion 3

*Position on landscape:* Remnants of inset fans at higher elevations

*Contrasting features:* Rarely flooded, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Belted Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Izo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Belted soil—VIIs, nonirrigated;  
 Izo soil—VIIw, nonirrigated  
*Range site:* Belted soil—029X036N; Izo soil—029X041N

## **1324—Belted-Annaw association, stony**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,800 to 6,200 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Belted very stony loam, moist, 2 to 8 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—60 percent
- Annaw very stony loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—35 percent

#### *Contrasting inclusions:*

- Inclusion 1: Izo very stony loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Slightly higher summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta  
*Percent of surface covered by rock fragments:* 7 percent stones

### **Typical Profile**

0 to 2 inches—very stony loam; 15 to 30 percent cobbles and stones, 20 to 40 percent pebbles (by weight); platy structure; soft, very friable;

moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC, CL-ML; estimated AASHTO classification—A-4  
 2 to 7 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6  
 7 to 31 inches—strongly cemented duripan  
 31 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—moderately slow; below the duripan—rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Annaw Soil**

*Position on landscape:* Inset fans and fan aprons  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, Bailey greasewood, Indian ricegrass  
*Percent of surface covered by rock fragments:* 6 percent stones

### **Typical Profile**

0 to 2 inches—very stony loamy sand; 25 to 40 percent cobbles and stones, 55 to 75 percent pebbles (by weight); subangular blocky structure; soft, very

friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, no layer of clay accumulation

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Belted Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Annaw Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Interpretive Groups

*Capability classification:* Belted soil—VIIs, nonirrigated; Annaw soil—VIIs, nonirrigated

*Range site:* Belted soil—029X036N; Annaw soil—029X036N

### 1325—Belted-Terlco-Izo association

#### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

#### Composition

*Major components:*

- Belted very cobbly sandy loam, moist, 2 to 15 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—50 percent

- Terlco very gravelly sandy loam, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—20 percent

- Izo very gravelly sand, 2 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Annaw gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—9 percent

- Inclusion 2: Duric Haplargids, very gravelly sandy loam, 2 to 8 percent slopes (Duric Haplargids, coarse-loamy, mixed, mesic)—4 percent

- Inclusion 3: Typic Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Side slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

### **Typical Profile**

- 0 to 2 inches—very cobbly sandy loam; 30 to 45 percent cobbles and stones, 40 to 55 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2
- 2 to 7 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6
- 7 to 31 inches—strongly cemented duripan
- 31 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Terlco Soil**

*Position on landscape:* Remnants of inset fans and fan aprons

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

### **Typical Profile**

- 0 to 2 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7
- 11 to 18 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, burrobrush, rabbitbrush, Bailey greasewood

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, SP-SM, SP; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Remnants of inset fans  
*Contrasting features:* No layer of clay accumulation, rarely flooded

#### **Inclusion 2**

*Position on landscape:* Fan aprons  
*Contrasting features:* Rarely flooded, less than 18 percent clay throughout the profile

#### **Inclusion 3**

*Position on landscape:* Fan drainageways and remnant channels  
*Slope features:* Length—short; shape—slightly concave  
*Contrasting features:* No layer of clay accumulation, rarely flooded

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Belted Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, large stones  
*Shallow excavations:* Severe—cemented pan, cutbanks cave  
*Local roads and streets:* Moderate—cemented pan, slope  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Terlco Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good

*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Belted soil—VIIIs, nonirrigated; Terlco soil—VIIIs, nonirrigated; Izo soil—VIIw, nonirrigated  
*Range site:* Belted soil—029X036N; Terlco soil—029X036N; Izo soil—029X041N

## **1326—Belted-Breko association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,900 to 6,400 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Belted very gravelly loam, moist, 2 to 15 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—50 percent
- Breko gravelly sandy loam, 8 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Crunker very gravelly sandy loam, 2 to 15 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 2 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Annaw gravelly sandy loam, 2 to 15 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

### **Typical Profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable;

moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 to 34 inches—strongly cemented duripan

34 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Breko Soil**

*Position on landscape:* Side slopes and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

### **Typical Profile**

0 to 6 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 21 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

21 to 29 inches—extremely gravelly sandy clay loam; 75 to 90 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GC; estimated AASHTO classification—A-2

29 to 60 inches—extremely gravelly coarse sandy loam, extremely gravelly sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Lower inset fans and remnant channels

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

##### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

##### Inclusion 3

*Position on landscape:* Inset fans and south- and west-facing side slopes of fan piedmont remnants

*Contrasting features:* No layer of clay accumulation, rarely flooded

#### Major Uses

**Current uses:** Rangeland, wildlife habitat, irrigated cropland

#### Ratings of the Belted Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Breko Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—slope, frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Interpretive Groups

*Capability classification:* Belted soil—VIIs, nonirrigated; Breko soil—IVe, irrigated, and VIIc, nonirrigated

*Range site:* Belted soil—29X036N; Breko soil—29X006N

### 1327—Belted-Lathrop association

#### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,700 to 6,200 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Belted very cobbly sandy loam, moist, 4 to 30 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—45 percent

- Lathrop very stony fine sandy loam, 4 to 15 percent slopes (Duric Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—40 percent

#### *Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very cobbly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Downeyville very cobbly fine sandy loam, 15 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Izo very stony sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Rock outcrop—2 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Slightly higher fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

#### **Typical Profile**

0 to 2 inches—very cobbly sandy loam; 30 to 45 percent cobbles and stones, 40 to 55 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

2 to 7 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6

7 to 31 inches—strongly cemented duripan

31 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and

stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Lathrop Soil**

*Position on landscape:* Slightly lower side slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta, Indian ricegrass

*Percent of surface covered by rock fragments:* 6 percent stones

#### **Typical Profile**

0 to 5 inches—very stony fine sandy loam; 25 to 45 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM-SC, GM-GC, SM, GM; estimated AASHTO classification—A-1, A-2

5 to 11 inches—clay loam, loam, gravelly sandy clay loam; 0 to 15 percent cobbles and stones, 15 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, GC, CL; estimated AASHTO classification—A-6

11 to 30 inches—extremely cobbly loamy sand, very

gravelly loamy coarse sand, very cobbly sand; 15 to 65 percent cobbles and stones, 60 to 90 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, GP, SP, GP-GM; estimated AASHTO classification—A-1

30 to 60 inches—extremely gravelly coarse sand, very cobbly sand, extremely cobbly sand; 15 to 65 percent cobbles and stones, 60 to 90 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP, SP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing side slopes of fan piedmont remnants

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, galleta

#### Inclusion 2

*Position on landscape:* South- and west-facing side slopes of hills

*Contrasting features:* Hard bedrock within a depth of 20 inches, no layer of weak silica accumulation

*Distinctive present vegetation:* Shadscale, Bailey greasewood, spiny hopsage, galleta

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 4

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Belted Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—cemented pan, slope, cutbanks cave

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Lathrop Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, large stones, too crusty

*Shallow excavations:* Severe—cutbanks cave, large stones

*Local roads and streets:* Severe—large stones

*Roadfill:* Poor—large stones

*Sand:* Improbable source—large stones

*Gravel:* Improbable source—large stones

*Embankments, dikes, and levees:* Severe—seepage, large stones

### Interpretive Groups

*Capability classification:* Belted soil—VIIIs, nonirrigated; Lathrop soil—VIIIs, nonirrigated

*Range site:* Belted soil—029X036N; Lathrop soil—029X036N

## 1328—Belted-Zadvar association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 6,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Belted very gravelly loam, 4 to 30 percent slopes

(Haplic Durargids, loamy, mixed, mesic, shallow)—65 percent

- Zadvar gravelly fine sandy loam, 4 to 15 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Durorthidic Torriorthents, gravelly fine sandy loam, 2 to 8 percent slopes (Durorthidic Torriorthents, sandy, mixed, mesic)—4 percent

- Inclusion 3: Stewval very gravelly sandy loam, 4 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Downeyville very gravelly sandy loam, moist, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Summits and side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

### **Typical Profile**

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 to 34 inches—strongly cemented duripan

34 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Zadvar Soil**

*Position on landscape:* Toe slopes of fan piedmont remnants at higher elevations and north-facing side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Nevada ephedra

### **Typical Profile**

0 to 3 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-1

3 to 10 inches—gravelly clay loam, sandy clay loam; 0 to 5 percent cobbles and stones, 15 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6

10 to 25 inches—strongly cemented duripan

25 to 60 inches—stratified extremely gravelly sandy loam to very gravelly coarse sand; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 10 to 14 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—moderately slow;  
 below the duripan—rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—  
 1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of inset fans  
*Contrasting features:* No layer of clay accumulation,  
 rarely flooded

#### Inclusion 2

*Position on landscape:* Inset fans  
*Contrasting features:* No layer of clay accumulation,  
 rarely flooded  
*Distinctive present vegetation:* Douglas rabbitbrush,  
 Indian ricegrass

#### Inclusion 3

*Position on landscape:* Hills  
*Slope features:* Length—short; shape—convex  
*Contrasting features:* Hard bedrock within a depth of 20  
 inches, no duripan throughout the profile

#### Inclusion 4

*Position on landscape:* Hills at lower elevations  
*Slope features:* Length—short; shape—convex  
*Contrasting features:* Hard bedrock within a depth of 20  
 inches, no duripan throughout the profile

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Belted Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cemented pan, slope,  
 cutbanks cave  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Probable source

*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Zadvar Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants  
 (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty  
*Shallow excavations:* Severe—cemented pan, cutbanks  
 cave  
*Local roads and streets:* Moderate—cemented pan, frost  
 action, slope  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Belted soil—VIIIs, nonirrigated;  
 Zadvar soil—VIIIs, nonirrigated  
*Range site:* Belted soil—029X036N; Zadvar soil—  
 029X008N

## 1329—Belted-Koyen association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,000 to 5,600 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

#### Major components:

- Belted gravelly sandy loam, 4 to 15 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—70 percent
  - Koyen fine sandy loam, dry, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Entic Durorthids, gravelly sandy loam, 15 to 30 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—6 percent
  - Inclusion 2: Goldyke gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—4 percent
  - Inclusion 3: Blacktop very gravelly loamy sand, 30 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
  - Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Belted Soil**

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Nevada ephedra, galleta, Indian ricegrass

*Percent of surface covered by rock fragments:* 15 percent pebbles, 5 percent cobbles

#### **Typical Profile**

0 to 3 inches—gravelly sandy loam; 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—clay loam, sandy clay loam, sandy loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; very strongly alkaline (pH 9.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, CL; estimated AASHTO classification—A-6

7 to 24 inches—strongly cemented duripan

24 to 60 inches—sandy loam, fine sandy loam, gravelly sandy loam; 0 to 40 percent pebbles (by weight); massive; slightly hard, friable; very strongly alkaline (pH 9.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, ML; estimated AASHTO classification—A-2, A-4

#### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Koyen Soil**

*Position on landscape:* Fan aprons and inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Indian ricegrass, shadscale, Bailey greasewood, galleta, spiny hopsage

#### **Typical Profile**

0 to 3 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

3 to 17 inches—sandy loam; 5 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

17 to 44 inches—stratified loam to gravelly loamy sand; 15 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

44 to 60 inches—gravelly loamy sand, very gravelly loamy sand; 45 to 55 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* No layer of clay accumulation, duripan within a depth of 20 inches

*Distinctive present vegetation:* Shadscale

#### **Inclusion 2**

*Position on landscape:* Hills

*Contrasting features:* Soft bedrock within a depth of 20 inches, no layer of clay accumulation

#### **Inclusion 3**

*Position on landscape:* Steeper eroded side slopes of hills

*Contrasting features:* Hard bedrock within a depth of 20 inches, no layer of clay accumulation

*Distinctive present vegetation:* Shadscale

#### **Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, no layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Belted Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, cemented pan

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Moderate—cemented pan, slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, excess salt

#### **Ratings of the Koyen Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Belted soil—VIIb, nonirrigated; Koyen soil—IIIe, irrigated, and VIIc, nonirrigated

*Range site:* Belted soil—029X017N; Koyen soil—029X017N

## **1340—Barnmot-Belted association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Barnmot very gravelly sandy clay loam, moist, 50 to 75 percent slopes (Typic Torriorthents, fine, montmorillonitic [calcareous], mesic)—45 percent
- Belted very gravelly loam, moist, 8 to 30 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, 30 to 75 percent slopes (Typic Torriorthents)—10 percent
- Inclusion 2: Lithic Haplargids, very gravelly sandy loam, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Xerollic Haplargids, very gravelly sandy loam, 30 to 75 percent slopes (Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic)—3 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Barnmot Soil**

*Position on landscape:* Back slopes of fan piedmont remnants with exhumed lake terraces

*Parent material:* Kind—residuum and colluvium; source—semiconsolidated lake sediments

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very

friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

2 to 60 inches—clay, clay loam; 0 to 10 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 8 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### Characteristics of the Belted Soil

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

### Typical Profile

0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 to 34 inches—strongly cemented duripan  
 34 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 6 to 14 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—moderately slow; below the duripan—rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* South-facing back slopes of fan piedmont remnants  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Sparse shadscale, Indian ricegrass, desert needlegrass

#### Inclusion 2

*Position on landscape:* Crests and shoulder slopes of hills  
*Contrasting features:* Hard bedrock within a depth of 20 inches

#### Inclusion 3

*Position on landscape:* North-facing back slopes of fan piedmont remnants at higher elevations  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Black sagebrush, Sandberg bluegrass, galleta

#### Inclusion 4

*Position on landscape:* Channels  
*Contrasting features:* Sandy textures throughout the profile, higher water-supplying capacity, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Other inclusions (in only a few areas):** Xeric Torriorthents, very gravelly sandy loam, 30 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)

**Position on landscape:** North-facing side slopes of fan piedmont remnants at higher elevations

**Slope features:** Length—short; shape—convex

**Contrasting features:** Higher water-supplying capacity, more than 35 percent rock fragments throughout the profile

**Distinctive present vegetation:** Wyoming big sagebrush, pine bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Barnmot Soil for Various Uses**

**Wildlife habitat elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Range seeding:** Poor—too arid, small stones, excess salt

**Shallow excavations:** Severe—slope

**Local roads and streets:** Severe—low strength, slope, shrink-swell

**Roadfill:** Poor—low strength, slope, shrink-swell

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Embankments, dikes, and levees:** Severe—hard to pack

#### **Ratings of the Belted Soil for Various Uses**

**Wildlife habitat elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Range seeding:** Poor—too arid, droughty, small stones

**Shallow excavations:** Severe—slope, cutbanks cave, cemented pan

**Local roads and streets:** Severe—slope

**Roadfill:** Fair—slope

**Sand:** Probable source

**Gravel:** Probable source

**Embankments, dikes, and levees:** Severe—seepage

### **Interpretive Groups**

**Capability classification:** Barnmot soil—VII<sub>s</sub>, nonirrigated; Belted soil—VII<sub>s</sub>, nonirrigated

**Range site:** Barnmot soil—029X022N; Belted soil—029X036N

## **1341—Barnmot-Haarvar association**

### **Map Unit Setting**

**Position on landscape:** Hills

**Elevation:** 5,600 to 6,400 feet

**Average annual precipitation:** About 8 inches

**Average annual air temperature:** About 53 degrees F

**Frost-free season:** About 130 days

### **Composition**

#### **Major components:**

- Barnmot gravelly clay loam, moist, 15 to 50 percent slopes (Typic Torriorthents, fine, montmorillonitic [calcareous], mesic)—55 percent

- Haarvar gravelly clay loam, 8 to 30 percent slopes (Xeric Torriorthents, clayey, montmorillonitic [calcareous], mesic, shallow)—30 percent

#### **Contrasting inclusions:**

- Inclusion 1: Lithic Xerollic Haplargids, stony sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, clayey-skeletal, montmorillonitic, mesic)—5 percent

- Inclusion 2: Rock outcrop—4 percent

- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Xerollic Haplargids, very gravelly sandy loam, 4 to 30 percent slopes (Xerollic Haplargids, fine-loamy, mixed, mesic)—3 percent

### **Characteristics of the Barnmot Soil**

**Position on landscape:** Predominantly south-, west-, and east-facing back slopes and shoulder slopes of hills

**Parent material:** Kind—residuum and colluvium; source—semiconsolidated lake sediments

**Slope features:** Length—short; shape—concave to convex

**Dominant present vegetation:** Bailey greasewood, galleta, shadscale

### **Typical Profile**

0 to 1 inch—gravelly clay loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SC; estimated AASHTO classification—A-6

1 to 60 inches—clay, clay loam; 0 to 10 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7

### **Soil and Water Features**

**Depth to bedrock:** More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 8 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Characteristics of the Haarvar Soil**

*Position on landscape:* Shoulder slopes and back slopes of hills  
*Parent material:* Kind—residuum; source—Tertiary sedimentary rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, Sandberg bluegrass

### **Typical Profile**

0 to 1 inch—gravelly clay loam; 25 to 40 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7  
 1 to 14 inches—clay; 0 to 10 percent pebbles (by weight); massive; hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7  
 14 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing shoulder slopes and back slopes of hills  
*Contrasting features:* Hard bedrock within a depth of 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### **Inclusion 2**

*Position on landscape:* Scattered small peaks (mostly adjacent to hill crests)

*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, more than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Less than 35 percent clay throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

#### **Other inclusions (in only a few areas):** Badland

*Position on landscape:* Steeper side slopes of hills

*Contrasting features:* Lacustrine sediments exposed at the surface

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Barnmot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, excess salt, erodes easily

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, slope, shrink-swell

*Roadfill:* Poor—low strength, slope, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—hard to pack

#### **Ratings of the Haarvar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—shrink-swell, slope, low strength

*Roadfill:* Poor—depth to bedrock, shrink-swell, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—hard to pack

### **Interpretive Groups**

*Capability classification:* Barnmot soil—VIIe,

nonirrigated; Haarvar soil—VIIe, nonirrigated

*Range site:* Barnmot soil—029X022N; Haarvar soil—29X014N

## **1342—Barnmot-Badland association**

### **Map Unit Setting**

*Position on landscape:* Remnants of pediments

*Elevation:* 4,900 to 5,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Barnmot gravelly clay loam, 8 to 30 percent slopes (Typic Torriorthents, fine, montmorillonitic [calcareous], mesic)—55 percent
- Badland—35 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, gravelly clay loam, 2 to 4 percent slopes (Typic Torriorthents, fine, montmorillonitic [calcareous], mesic)—10 percent

### **Characteristics of the Barnmot Soil**

*Position on landscape:* Summits and side slopes of pediment remnants

*Parent material:* Kind—residuum and colluvium; source—semiconsolidated lake sediments

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, King desertgrass, Nevada ephedra

### **Typical Profile**

0 to 2 inches—gravelly clay loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated

Unified classification—SC; estimated AASHTO classification—A-6

2 to 60 inches—clay, clay loam; 0 to 10 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 8 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Badland**

*Position on landscape:* Areas of very eroded lacustrine sediments exposed on pediment remnants

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower summits of pediment remnants

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* Slopes of less than 4 percent

*Distinctive present vegetation:* Cooper wolfberry

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Barnmot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—excess salt, too arid

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—low strength, shrink-swell, slope

*Roadfill:* Poor—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—hard to pack

### **Interpretive Groups**

*Capability classification:* Barnmot soil—VIIIs, nonirrigated; Badland—VIIIIs

*Range site:* Barnmot soil—027X027N

## **1350—Calpeak-Gabbvally-Tejabe association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,500 to 7,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Calpeak very gravelly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—45 percent
  - Gabbvally very stony loamy coarse sand, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—25 percent
  - Tejabe very stony sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Rock outcrop—8 percent
  - Inclusion 2: Stewval very gravelly sandy loam, 8 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
  - Inclusion 3: Lithic Torriorthents, very gravelly sandy loam, 8 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent
  - Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 8 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Calpeak Soil**

*Position on landscape:* Summits, crests, and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very

friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

5 to 10 inches—weathered bedrock

10 to 40 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Gabbvally Soil**

*Position on landscape:* South-, east-, and west-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, galleta, Nevada ephedra, Sandberg bluegrass

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 2 inches—very stony loamy coarse sand; 15 to 30 percent cobbles and stones, 40 to 60 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

2 to 8 inches—very gravelly sandy clay loam, very

gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2  
8 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### Characteristics of the Tejabe Soil

*Position on landscape:* North-facing back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff, andesite  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, spiny hopsage  
*Percent of surface covered by rock fragments:* 10 percent stones

#### Typical Profile

0 to 1 inch—very stony sandy loam; 15 to 30 percent cobbles and stones, 40 to 60 percent pebbles (by weight); subangular blocky structure; very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2  
1 to 9 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
9 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

##### Inclusion 2

*Position on landscape:* Crests, shoulder slopes, and some north-facing back slopes of mountains  
*Slope features:* Shape—convex  
*Contrasting features:* Calcareous throughout the profile, layer of clay accumulation  
*Distinctive present vegetation:* Black sagebrush

##### Inclusion 3

*Position on landscape:* Back slopes of mountains at lower elevations  
*Slope features:* Shape—convex  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Bailey greasewood, shadscale, rabbitbrush

##### Inclusion 4

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Other inclusions (in only a few areas):** Typic Torriorthents, 8 to 50 percent slopes

*Position on landscape:* Old seep areas adjacent to channels  
*Contrasting features:* Bedrock at a depth of more than 20 inches  
*Distinctive present vegetation:* Basin wildrye, black greasewood, Torrey quailbush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Calpeak Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Tejabe Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Calpeak soil—VIIIs, nonirrigated; Gabbvally soil—VIIIs, nonirrigated; Tejabe soil—VIIIs, nonirrigated

*Range site:* Calpeak soil—029X010N; Gabbvally soil—029X010N; Tejabe soil—027X007N

## 1351—Calpeak-Goldyke association

### Map Unit Setting

*Position on landscape:* Hills

*Elevation:* 5,000 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Calpeak very gravelly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—60 percent

- Goldyke very gravelly sandy loam, 30 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Blacktop very gravelly sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent

- Inclusion 2: Rock outcrop—4 percent

- Inclusion 3: Typic Torriorthents, gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic, shallow)—4 percent

- Inclusion 4: Xeric Torriorthents, gravelly sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—2 percent

### Characteristics of the Calpeak Soil

*Position on landscape:* Shoulder slopes and back slopes of hills

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta, Indian ricegrass

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

5 to 40 inches—weathered bedrock

40 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Goldyke Soil

*Position on landscape:* South-facing back slopes of hills  
*Parent material:* Kind—residuum and colluvium; source—rhyolite and rhyolitic tuff  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta, Indian ricegrass, littleleaf horsebrush

### Typical Profile

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 3 to 6 inches—gravelly sandy loam, gravelly fine sandy loam; 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2  
 6 to 22 inches—weathered bedrock  
 22 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 2 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid

*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* South-facing back slopes of hills at lower elevations  
*Contrasting features:* Lower water-supplying capacity, slopes of more than 50 percent

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Toe slopes of hills  
*Contrasting features:* Bedrock at a depth of more than 20 inches

#### Inclusion 4

*Position on landscape:* North-facing back slopes of hills  
*Contrasting features:* Higher water-supplying capacity, slopes of more than 50 percent  
*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Calpeak Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Goldyke Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Calpeak soil—VIIIs, nonirrigated;  
 Goldyke soil—VIIIs, nonirrigated  
*Range site:* Calpeak soil—029X010N; Goldyke soil—  
 029X022N

## **1353—Calpeak-Goldyke-Gabbvally association**

### **Map Unit Setting**

*Position on landscape:* Hills  
*Elevation:* 5,200 to 6,200 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Calpeak very gravelly sandy loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—50 percent
- Goldyke gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—20 percent
- Gabbvally very stony loam, moist, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Stewval very gravelly sandy loam, 8 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Tejabe very stony sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—2 percent

### **Characteristics of the Calpeak Soil**

*Position on landscape:* East- and west-facing back slopes and shoulder slopes of hills and south-facing back slopes at higher elevations  
*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 2 to 5 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 5 to 40 inches—weathered bedrock  
 40 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Goldyke Soil**

*Position on landscape:* South- and west-facing back slopes of hills at lower elevations  
*Parent material:* Kind—residuum and colluvium; source—rhyolite and rhyolitic tuff  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta, Indian ricegrass, littleleaf horsebrush

### **Typical Profile**

0 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 6 inches—gravelly sandy loam, gravelly fine sandy loam; 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-1, A-2

6 to 22 inches—weathered bedrock

22 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 2 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Gabbvally Soil

*Position on landscape:* North-facing back slopes of hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 2 inches—very stony loam; 10 to 40 percent cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4);

nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Summits of hills and some north-facing shoulder slopes and back slopes

*Slope features:* Length—short; shape—convex

*Contrasting features:* Layer of clay accumulation, calcium carbonates throughout the profile

*Distinctive present vegetation:* Black sagebrush

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, slopes of less than 8 percent, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### Inclusion 4

*Position on landscape:* North-facing back slopes

*Slope features:* Shape—concave

*Contrasting features:* Slopes of more than 50 percent, no layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

**Other inclusions (in only a few areas):** Xeric Torriorthents, clay loam, 15 to 50 percent slopes (Xeric Torriorthents, clayey, montmorillonitic [calcareous], mesic, shallow)

*Position on landscape:* Eroded hill side slopes in Gabbs Valley range north of Gillis Camp

*Contrasting features:* Clayey textures throughout the profile

*Distinctive present vegetation:* Nevada ephedra, black sagebrush, Stansbury cliffrose

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Calpeak Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Goldyke Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Calpeak soil—VIIs, nonirrigated; Goldyke soil—VIIs, nonirrigated; Gabbvally soil—VIIs, nonirrigated

*Range site:* Calpeak soil—029X010N; Goldyke soil—029X022N; Gabbvally soil—029X010N

## **1354—Calpeak-Lomoiné association**

### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 6,300 to 6,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Calpeak very gravelly sandy loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—50 percent
- Lomoiné very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly sandy loam, 2 to 15 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Rock outcrop—4 percent
- Inclusion 3: Beelem very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—3 percent
- Inclusion 4: Gabbvally very stony sandy loam, 30 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Calpeak Soil**

*Position on landscape:* South-facing crests and back slopes of hills

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta, Indian ricegrass

*Percent of surface covered by rock fragments:* 30 percent pebbles

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
5 to 40 inches—weathered bedrock  
40 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Lomoiné Soil

*Position on landscape:* North-facing back slopes and broader summits of hills  
*Parent material:* Kind—residuum and colluvium; source—welded tuffs  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, Sandberg bluegrass

### Typical Profile

0 to 4 inches—very gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1  
4 to 8 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1  
8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 14 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* More eroded shoulder slopes and back slopes of hills  
*Contrasting features:* Less than 35 percent rock fragments throughout the profile, fewer carbonates throughout the profile  
*Distinctive present vegetation:* Western juniper

#### Inclusion 4

*Position on landscape:* Back slopes of hills at higher elevations  
*Contrasting features:* Layer of clay accumulation, slopes of more than 30 percent  
*Distinctive present vegetation:* Wyoming big sagebrush, desert needlegrass, Nevada ephedra

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Calpeak Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Lomoine Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope, depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Calpeak soil—VIIs, nonirrigated; Lomoine soil—VIIs, nonirrigated  
*Range site:* Calpeak soil—029X010N; Lomoine soil—029X014N

### **1361—Gabbvally-Tejabe-Mirkwood association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,400 to 6,400 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

#### **Composition**

##### *Major components:*

- Gabbvally very stony loamy coarse sand, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—35 percent
- Tejabe very stony sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—30 percent
- Mirkwood extremely stony sandy loam, 30 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—8 percent
- Inclusion 2: Blacktop very gravelly sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
- Inclusion 3: Stewval very gravelly sandy loam, 4 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy

sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

#### **Characteristics of the Gabbvally Soil**

*Position on landscape:* East-, west-, and south-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—volcanic rock  
*Slope features:* Length—long; shape—convex to concave  
*Dominant present vegetation:* Wyoming big sagebrush, galleta, Sandberg bluegrass  
*Percent of surface covered by rock fragments:* 10 percent stones

#### **Typical Profile**

0 to 2 inches—very stony loamy coarse sand; 15 to 30 percent cobbles and stones, 40 to 60 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1  
 2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2  
 8 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### **Characteristics of the Tejabe Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—rhyolitic tuff, andesite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, spiny hopsage

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 1 inch—very stony sandy loam; 15 to 30 percent cobbles and stones, 40 to 60 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2

1 to 9 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

9 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Mirkwood Soil

*Position on landscape:* South-facing side slopes of mountains at lower elevations

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Desert needlegrass, shadscale, littleleaf horsebrush

*Percent of surface covered by rock fragments:* 25

percent pebbles, 15 percent cobbles, 30 percent stones

### Typical Profile

0 to 1 inch—extremely stony sandy loam; 40 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2, A-1

1 to 5 inches—very gravelly loam, very gravelly clay loam; 5 to 15 percent cobbles and stones, 45 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

5 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* South-facing side slopes of mountains at lower elevations

*Slope features:* Shape—convex

*Contrasting features:* No layer of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Shadscale

#### Inclusion 3

*Position on landscape:* Crests and shoulder slopes of mountains at upper elevations

*Slope features:* Shape—convex

*Contrasting features:* Slopes of less than 30 percent, more carbonates throughout the profile

*Distinctive present vegetation:* Black sagebrush

#### **Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* More than 60 inches deep, slopes of less than 8 percent, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

**Other inclusions (in only a few areas):** Typic Torriorthents, 15 to 50 percent slopes, in Gabbs Valley Range east of Gillis Camp

*Position on landscape:* Old seep on foot slopes of mountains adjacent to channels

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Basin wildrye, Torrey quailbush, black greasewood

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Tejabe Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Mirkwood Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Gabbvally soil—VIIIs, nonirrigated; Tejabe soil—VIIIs, nonirrigated; Mirkwood soil—VIIIs, nonirrigated

*Range site:* Gabbvally soil—029X010N; Tejabe soil—027X007N; Mirkwood soil—027X017N

### **1362—Gabbvally-Gabbvally, very steep-Stewval association**

#### **Map Unit Setting**

*Position on landscape:* Hills and mountains

*Elevation:* 6,000 to 7,800 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 110 days

#### **Composition**

*Major components:*

- Gabbvally very gravelly sandy loam, moist, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—60 percent
  - Gabbvally very gravelly sandy loam, moist, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—15 percent
  - Stewval very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—10 percent
- Contrasting inclusions:*
- Inclusion 1: Rock outcrop—6 percent
  - Inclusion 2: Downeyville very gravelly sandy loam, moist, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
  - Inclusion 3: Brier very stony loam, 30 to 50 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—2 percent
  - Inclusion 4: Gabbvally very stony sandy loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent

#### **Characteristics of the Less Sloping Gabbvally Soil**

*Position on landscape:* Shoulder slopes and back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush,  
bottlebrush squirreltail, Nevada ephedra, galleta,  
Sandberg bluegrass

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Very Steep Gabbvally Soil

*Position on landscape:* Back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush,  
bottlebrush squirreltail, Nevada ephedra, galleta,  
Sandberg bluegrass

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Stewval Soil

*Position on landscape:* Crests and shoulder slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium;  
source—rhyolitic tuff, andesite

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta,  
Sandberg bluegrass, Nevada ephedra

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
4 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Lower parts of south- and west-facing back slopes of hills and shoulder slopes  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 3

*Position on landscape:* North-facing back slopes of hills and mountains  
*Slope features:* Length—short; shape—concave  
*Contrasting features:* More organic matter throughout the profile, higher water-supplying capacity  
*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### Inclusion 4

*Position on landscape:* South-facing back slopes of mountains  
*Contrasting features:* 3 to 15 percent stones on the surface, warmer soil temperature

*Distinctive present vegetation:* Wyoming big sagebrush, desert needlegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Less Sloping Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Very Steep Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Gabbvally soil—VIIIs, nonirrigated; very steep Gabbvally soil—VIIIs, nonirrigated; Stewval soil—VIIIs, nonirrigated  
*Range site:* Gabbvally soil—029X010N; very steep Gabbvally soil—029X010N; Stewval soil—029X014N

### 1363—Gabbvally very stony loam, moist, 15 to 50 percent slopes

#### Map Unit Setting

*Position on landscape:* Hills and mountains

*Elevation:* 6,000 to 7,400 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

#### Composition

*Major components:*

- Gabbvally very stony loam, moist, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Old Camp very stony sandy loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Rock outcrop—5 percent

- Inclusion 3: Brier very stony sandy loam, 15 to 50 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—2 percent

- Inclusion 4: Beelem very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed, nonacid, mesic)—2 percent

#### Characteristics of the Gabbvally Soil

*Position on landscape:* Crests and side slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

#### Typical Profile

0 to 2 inches—very stony loam; 10 to 40 percent cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR

less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2  
8 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* North-facing back slopes of hills and mountains

*Contrasting features:* Cooler soil temperature, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass, Thurber needlegrass, spiny hopsage

##### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

##### Inclusion 3

*Position on landscape:* North-facing back slopes of mountains at higher elevations

*Contrasting features:* More organic matter throughout the profile, higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Sandberg bluegrass

##### Inclusion 4

*Position on landscape:* Back slopes of mountains and hills

*Contrasting features:* No layer of clay accumulation

*Distinctive present vegetation:* Utah juniper, Wyoming big sagebrush

#### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X010N

## **1365—Gabbvally-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,800 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Gabbvally very stony loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—50 percent

- Rock outcrop—35 percent

*Contrasting inclusions:*

- Inclusion 1: Gabbvally very stony loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—10 percent

- Inclusion 2: Beelem very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed, nonacid, mesic)—5 percent

### **Characteristics of the Gabbvally Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta, pine bluegrass

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 2 inches—very stony loam; 10 to 40 percent

cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and shoulder slopes of mountains

*Contrasting features:* Slopes of less than 50 percent

#### **Inclusion 2**

*Position on landscape:* Eroded north-, east-, and west-facing back slopes of mountains at higher elevations

*Contrasting features:* No layer of clay accumulation

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Gabbvally soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs  
*Range site:* Gabbvally soil—029X010N

## 1366—Gabbvally-Beelem-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Hills and mountains  
*Elevation:* 6,000 to 7,400 feet  
*Average annual precipitation:* About 10 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 110 days

### Composition

#### Major components:

- Gabbvally very stony loam, moist, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—40 percent
- Beelem very gravelly sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy, mixed, [calcareous], mesic)—35 percent
- Rock outcrop—10 percent

#### Contrasting inclusions:

- Inclusion 1: Downeyville very gravelly fine sandy loam, moist, 30 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—9 percent
- Inclusion 2: Belted very gravelly fine sandy loam, moist, 4 to 30 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—4 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Gabbvally Soil

*Position on landscape:* Back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 2 inches—very stony loam; 10 to 40 percent cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Beelem Soil

*Position on landscape:* Back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Utah juniper, singleleaf pinyon, Wyoming big sagebrush, Nevada ephedra, black sagebrush, Sandberg bluegrass

**Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Back slopes of mountains at lower elevations

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, Bailey greasewood, galleta

**Inclusion 2**

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Horizon of silica cementation, slopes of less than 30 percent, lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, Bailey greasewood, galleta

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, slopes of less than 15 percent, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Woodland**

*Site index for common trees on the Beelem soil:*

Singleleaf pinyon—30; Utah juniper—30

*Most important native understory plants:* Beelem—

Wyoming big sagebrush, Nevada ephedra, black sagebrush, green ephedra, Indian ricegrass, bottlebrush squirreltail

**Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Beelem Soil for Various Uses**

*Wildlife habitat elements:* Coniferous plants (nonirrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Gabbvally soil—VIIs, nonirrigated; Beelem soil—VIIs, nonirrigated

*Range site:* Gabbvally soil—029X010N

*Woodland suitability group:* Beelem soil—1R

**1420—Dedmount-Slaw association****Map Unit Setting**

*Position on landscape:* Basin floors

*Elevation:* 4,100 to 4,200 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 140 days

**Composition**

*Major components:*

- Dedmount silty clay loam, 0 to 2 percent slopes (Aquic Torriorthents, fine, montmorillonitic [calcareous], mesic)—55 percent

- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Nuyobe silty clay loam, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—4 percent

- Inclusion 2: Isolde fine sand, warm, 8 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent

- Inclusion 3: Playas—4 percent

- Inclusion 4: Nuyobe silty clay loam, occasionally flooded, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—3 percent

**Characteristics of the Dedmount Soil**

*Position on landscape:* Lake plains

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Torrey quailbush, black greasewood, seepweed, inland saltgrass

**Typical Profile**

- 0 to 2 inches—silty clay loam; platy structure; hard, very friable; very strongly alkaline (pH 9.6); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR 50 to 100); estimated Unified classification—ML; estimated AASHTO classification—A-6

- 2 to 66 inches—silty clay, silty clay loam; massive; hard, very friable; strongly alkaline (pH 9.0); moderately saline to strongly saline (more than 8 mmhos/cm); moderately sodic (SAR 30 to 50); estimated Unified classification—ML, MH; estimated AASHTO classification—A-7

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 48 to 60 inches (January to April)

*Frequency of flooding:* Rare

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 18 inches

*Runoff:* Ponded

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

**Characteristics of the Slaw Soil**

*Position on landscape:* Slightly higher alluvial flats

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, seepweed, shadscale

**Typical Profile**

- 0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

- 9 to 48 inches—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

- 48 to 60 inches—sandy loam, fine sandy loam, sandy clay loam; 0 to 5 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SC, SM; estimated AASHTO classification—A-4, A-2, A-6

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief to brief; months—April to August

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Ponded  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower lake plains  
*Contrasting features:* Water table at a depth of 30 to 60 inches  
*Distinctive present vegetation:* Alkali sacaton, Baltic rush, inland saltgrass

#### **Inclusion 2**

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Sandy textures throughout the profile  
*Distinctive present vegetation:* Black greasewood, littleleaf horsebrush, fourwing saltbush, Indian ricegrass

#### **Inclusion 3**

*Position on landscape:* Sink areas  
*Contrasting features:* Frequently flooded, ponded for significant periods  
*Distinctive present vegetation:* None

#### **Inclusion 4**

*Position on landscape:* Lake plains  
*Contrasting features:* Occasionally flooded, less than 35 percent clay throughout the profile

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Dedmount Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—excess salt, excess sodium

*Shallow excavations:* Moderate—too clayey, wetness  
*Local roads and streets:* Severe—low strength, shrink-swell

*Roadfill:* Poor—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess salt, hard to pack

### **Ratings of the Slaw Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, too clayey

*Local roads and streets:* Severe—flooding, low strength

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess salt

### **Interpretive Groups**

*Capability classification:* Dedmount soil—VII<sub>s</sub>, nonirrigated; Slaw soil—III<sub>w</sub>, irrigated, and VII<sub>w</sub>, nonirrigated

*Range site:* Dedmount soil—027X041N; Slaw soil—027X025N

## **1440—Slaw-Isolde-Cirac association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,100 to 4,900 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

### **Composition**

*Major components:*

- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—35 percent

- Isolde fine sand, warm, 8 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—30 percent

- Cirac sandy clay loam, ponded, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Playas—10 percent

- Inclusion 2: Typic Torriorthents, fine sandy loam, 0 to 2 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—5 percent

### **Characteristics of the Slaw Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, seepweed, shadscale

#### Typical Profile

0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 48 inches—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

48 to 60 inches—sandy loam, fine sandy loam, sandy clay loam; 0 to 5 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SC, SM; estimated AASHTO classification—A-4, A-2, A-6

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief to brief; months—April to August  
*Permeability:* Slow  
*Available water capacity:* About 10 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Pondered  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

#### Characteristics of the Isolde Soil

*Position on landscape:* Semistabilized sand dunes  
*Parent material:* Mixed eolian material  
*Slope features:* Length—very short; shape—concave to convex  
*Dominant present vegetation:* Black greasewood, Indian ricegrass, seepweed

#### Typical Profile

0 to 6 inches—fine sand; single grained; loose;

moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

6 to 60 inches—fine sand, sand; single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-3

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—moderate; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

#### Characteristics of the Cirac Soil

*Position on landscape:* Interdune flats  
*Parent material:* Mixed alluvium  
*Slope features:* Length—very short; shape—smooth  
*Dominant present vegetation:* Black greasewood, seepweed, shadscale

#### Typical Profile

0 to 4 inches—sandy clay loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable; very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6

4 to 60 inches—stratified gravelly sand to silt loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—February to September

*Permeability:* Moderately rapid

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Sink areas

*Contrasting features:* Frequently flooded, ponding for significant periods

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Higher alluvial flats

*Contrasting features:* Nonflooded, loamy textures throughout the profile

*Distinctive present vegetation:* Bailey greasewood, Cooper wolfberry

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Slaw Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, too clayey

*Local roads and streets:* Severe—low strength, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess salt

### **Ratings of the Isolde Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—piping, seepage

### **Ratings of the Cirac Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—fair; domestic grasses and legumes

(irrigated)—fair; wild herbaceous plants

(nonirrigated)—very poor; shrubs (nonirrigated)—

very poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, excess sodium

### **Interpretive Groups**

*Capability classification:* Slaw soil—IIIw, irrigated, and VIIw, nonirrigated; Isolde soil—IV, irrigated, and VIIe, nonirrigated; Cirac soil—IIIs, irrigated, and VIIs, nonirrigated

*Range site:* Slaw soil—027X025N; Isolde soil—027X016N; Cirac soil—027X025N

## **1441—Slaw silt loam, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,150 to 4,900 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 135 days

### **Composition**

*Major components:*

- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous] mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, fine sandy loam, 0 to

2 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—5 percent

- Inclusion 2: Isolde fine sand, warm, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent

- Inclusion 3: Playas—5 percent

### **Characteristics of the Slaw Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, seepweed, shadscale

### **Typical Profile**

0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 48 inches—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

48 to 60 inches—sandy loam, fine sandy loam, sandy clay loam; 0 to 5 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SC, SM; estimated AASHTO classification—A-4, A-2, A-6

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief to brief; months—April to August

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Pondered

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly higher alluvial flats

*Contrasting features:* Less than 18 percent clay throughout the profile, rarely flooded

*Distinctive present vegetation:* Bailey greasewood, Cooper wolfberry, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* Semistabilized sand dunes

*Contrasting features:* Sandy textures throughout the profile, slopes of more than 4 percent, nonflooded

*Distinctive present vegetation:* Black greasewood, fourwing saltbush

#### **Inclusion 3**

*Position on landscape:* Sink areas

*Contrasting features:* Frequently flooded, ponded for significant periods

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Slaw Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—fair; domestic grasses and legumes

(irrigated)—fair; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, too clayey

*Local roads and streets:* Severe—low strength, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess salt

### **Interpretive Groups**

*Capability classification:* IIIw, irrigated, and VIIw, nonirrigated

*Range site:* 027X025N

## **1442—Slaw-Playas association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,150 to 4,250 feet

*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 135 days

### **Composition**

#### *Major components:*

- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—75 percent
- Playas—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, warm, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—7 percent
- Inclusion 2: Typic Torriorthents, fine sandy loam, 0 to 2 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—3 percent

### **Characteristics of the Slaw Soil**

*Position on landscape:* Alluvial flats

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, seepweed, shadscale

#### **Typical Profile**

0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 48 inches—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

48 to 60 inches—sandy loam, fine sandy loam, sandy clay loam; 0 to 5 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SC, SM; estimated AASHTO classification—A-4, A-2, A-6

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief to brief; months—April to August

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Pondered

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Playas**

*Position on landscape:* Sink areas

*Slope features:* Length—long; shape—plane

*Dominant present vegetation:* None

*Flooding:* Frequency—frequent; duration—very long; months—April to August

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Semistabilized sand dunes

*Contrasting features:* Sandy textures throughout the profile, slopes of more than 4 percent, nonflooded

*Distinctive present vegetation:* Black greasewood, fourwing saltbush, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* Slightly higher alluvial flats

*Contrasting features:* Less than 18 percent clay throughout the profile, rarely flooded

*Distinctive present vegetation:* Bailey greasewood, Cooper wolfberry

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Slaw Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—fair; domestic grasses and legumes

(irrigated)—fair; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, too clayey

*Local roads and streets:* Severe—low strength, flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess salt

### **Interpretive Groups**

*Capability classification:* Slaw soil—IIIw, irrigated, and VIIw, nonirrigated; Playas—VIIIw

*Range site:* Slaw soil—027X025N

## **1445—Slaw, reclaimed-Slaw-Fallon complex, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* River terraces

*Elevation:* 4,100 to 4,200 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

### **Composition**

*Major components:*

- Slaw silt loam, reclaimed, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—40 percent

- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—25 percent

- Fallon loamy fine sand, nonflooded, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, sand, 0 to 2 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—5 percent

- Inclusion 2: Typic Torriorthents, silt loam, 0 to 2 percent slopes (Typic Torriorthents, fine-silty over sandy or sandy-skeletal, mixed [calcareous], mesic)—5 percent

- Inclusion 3: Typic Torriorthents, sand, 0 to 2 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—3 percent

- Inclusion 4: Fallon loamy fine sand, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—2 percent

### **Characteristics of the Reclaimed Slaw Soil**

*Position on landscape:* River terraces

*Parent material:* Lacustrine sediments and mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Alfalfa hay and pasture grasses and legumes

### **Typical Profile**

0 to 9 inches—silt loam; 0 to 5 percent pebbles (by

weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

9 to 41 inches—silt loam, silty clay loam; massive; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7

41 to 60 inches—stratified sand to silt loam; massive; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 25 inches

*Runoff:* Pondered

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Slaw Soil**

*Position on landscape:* River terraces

*Parent material:* Lacustrine sediments and mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, Torrey quailbush, basin wildrye

### **Typical Profile**

0 to 9 inches—silt loam; subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

9 to 40 inches—stratified very fine sandy loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline to strongly saline (more than 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified

classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

40 to 60 inches—stratified loamy fine sand to silt loam; massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic to slightly sodic (SAR 4 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Ponded

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

#### Characteristics of the Fallon Soil

*Position on landscape:* River terraces

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Torrey quailbush, black greasewood, basin wildrye, Indian ricegrass

#### Typical Profile

0 to 8 inches—loamy fine sand; massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

8 to 60 inches—stratified sand to silt loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 9 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Relict channels

*Contrasting features:* Sandy textures throughout the profile

##### Inclusion 2

*Position on landscape:* River terraces

*Contrasting features:* Sandy textures at a depth of 20 to 40 inches, silty surface texture

##### Inclusion 3

*Position on landscape:* Thin sand sheets over river terraces

*Contrasting features:* Calcareous throughout the profile, averages less than 18 percent clay throughout the profile

*Distinctive present vegetation:* Fourwing saltbush, Indian ricegrass

##### Inclusion 4

*Position on landscape:* Farmed stream terraces adjacent to Walker River

*Contrasting features:* Nonsodic throughout the profile, averages less than 18 percent clay throughout the profile

*Distinctive present vegetation:* Alfalfa hay and pasture

**Other inclusions (in only a few areas):** Slaw silt loam, 0 to 2 percent slopes

*Position on landscape:* Higher river terraces

*Contrasting features:* No sandy stratification below 40 inches, strongly sodic, siltier textures at a depth of more than 40 inches

*Distinctive present vegetation:* Torrey quailbush, black greasewood, basin wildrye, Indian ricegrass

#### Major Uses

**Current uses:** Irrigated cropland, homesites, rangeland, wildlife habitat

#### Ratings of the Reclaimed Slaw Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—good; domestic grasses and legumes

(irrigated)—good; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—low strength

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Moderate—piping, thin layer

#### **Ratings of the Slaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—low strength

*Roadfill:* Fair—low strength, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess sodium, piping, excess salt

#### **Ratings of the Fallon Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, excess sodium

#### **Interpretive Groups**

*Capability classification:* Reclaimed Slaw soil—II<sub>s</sub>, irrigated, and VII<sub>c</sub>, nonirrigated; Slaw soil—VII<sub>s</sub>, nonirrigated; Fallon soil—III<sub>s</sub>, irrigated, and VII<sub>s</sub>, nonirrigated

*Range site:* Reclaimed Slaw soil—irrigated cropland; Slaw soil—027X041N; Fallon soil—027X041N

### **1450—Nuyobe-Playas association**

#### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,100 to 4,150 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 135 days

#### **Composition**

*Major components:*

- Nuyobe silty clay loam, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—70 percent

- Playas—15 percent

*Contrasting inclusions:*

- Inclusion 1: Nuyobe sand, overblown, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—8 percent

- Inclusion 2: Isolde fine sand, warm, 4 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent

- Inclusion 3: Dedmount silty clay loam, 0 to 2 percent slopes (Aquic Torriorthents, fine, montmorillonitic, [calcareous], mesic)—3 percent

#### **Characteristics of the Nuyobe Soil**

*Position on landscape:* Lake plains

*Parent material:* Kind—silty lacustrine sediments; source—various kinds of rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Alkali sacaton, inland saltgrass, black greasewood

#### **Typical Profile**

0 to 6 inches—silty clay loam; granular structure; soft, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-7

6 to 60 inches—stratified very fine sandy loam to silty clay loam; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* November to May—24 to 36 inches; rest of year—more than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately slow

*Available water capacity:* About 12 inches

*Water-supplying capacity:* About 24 inches

*Runoff:* Pondered

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* High

### **Characteristics of the Playas**

*Position on landscape:* Sink areas

*Slope features:* Length—long; shape—plane

*Dominant present vegetation:* None

*Flooding:* Frequency—frequent; duration—very long; months—December to August

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Low lake terraces adjacent to playas

*Contrasting features:* Sandy surface

*Distinctive present vegetation:* Iodinebush, inland saltgrass

#### **Inclusion 2**

*Position on landscape:* Semistabilized dunes adjacent to playas

*Contrasting features:* Sandy throughout the profile, slopes of more than 4 percent, no flooding

*Distinctive present vegetation:* Black greasewood, fourwing saltbush, Indian ricegrass

#### **Inclusion 3**

*Position on landscape:* Higher lake plains

*Contrasting features:* Deeper to water table

*Distinctive present vegetation:* Torrey saltbush, black greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Nuyobe Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair

*Range seeding:* Poor—excess salt, excess sodium

*Shallow excavations:* Severe—wetness

*Local roads and streets:* Severe—low strength, frost action

*Roadfill:* Poor—low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—excess sodium, excess salt

### **Interpretive Groups**

*Capability classification:* Nuyobe soil—VIIw, nonirrigated; Playas—VIIIw

*Range site:* Nuyobe soil—027X005N

## **1451—Nuyobe-Slaw association**

### **Map Unit Setting**

*Position on landscape:* Bolson floors

*Elevation:* 4,100 to 4,200 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Nuyobe silty clay loam, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—60 percent
- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Aeric Halaquepts, silty clay loam, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—8 percent
- Inclusion 2: Isolde fine sand, warm, 0 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—7 percent

### **Characteristics of the Nuyobe Soil**

*Position on landscape:* Lake plains

*Parent material:* Silty lacustrine sediments

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black greasewood, rubber rabbitbrush, inland saltgrass, basin wildrye

### **Typical Profile**

- 0 to 6 inches—silty clay loam; granular structure; soft, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); strongly sodic (SAR more than 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-7
- 6 to 60 inches—stratified very fine sandy loam to silty clay loam; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* November to May—  
 24 to 36 inches; rest of year—more than 60 inches  
*Frequency of flooding:* Occasional  
*Permeability:* Moderately slow  
*Available water capacity:* About 12 inches  
*Water-supplying capacity:* About 24 inches  
*Runoff:* Poned  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.43; T value—  
 5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* High

### Characteristics of the Slaw Soil

*Position on landscape:* Slightly higher alluvial flats  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood,  
 seepweed, shadscale

### Typical Profile

0 to 9 inches—silt loam; 0 to 5 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); strongly saline (more than 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 9 to 48 inches—stratified very fine sandy loam to silty clay; massive; slightly hard, very friable; strongly alkaline (pH 8.8); strongly saline (more than 16 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—ML, CL; estimated AASHTO classification—A-6, A-7  
 48 to 60 inches—sandy loam, fine sandy loam, sandy clay loam; 0 to 5 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—SM-SC, SC, SM; estimated AASHTO classification—A-4, A-2, A-6

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief to brief; months—April to August  
*Permeability:* Slow  
*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 5 inches  
*Runoff:* Poned  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.55; T value—  
 5; wind erodibility group—4L  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly lower lake plains  
*Contrasting features:* Water table at a depth of 12 to 24 inches  
*Distinctive present vegetation:* Alkali sacaton, inland saltgrass

#### Inclusion 2

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Sandy textures throughout the profile  
*Distinctive present vegetation:* Black greasewood, fourwing saltbush, Indian ricegrass

### Major Uses

**Current uses:** Wildlife habitat, rangeland  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Nuyobe Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—fair  
*Range seeding:* Poor—excess salt, excess sodium  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—low strength, frost action  
*Roadfill:* Poor—low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—excess salt, excess sodium

### Ratings of the Slaw Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding, too clayey  
*Local roads and streets:* Severe—low strength, flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—excess salt

### **Interpretive Groups**

*Capability classification:* Nuyobe soil—VIIw, nonirrigated;  
 Slaw soil—IIIw, irrigated, and VIIw, nonirrigated  
*Range site:* Nuyobe soil—027X006N; Slaw soil—  
 027X025N

## **1480—Fawin-Crunker association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts, fan skirts  
*Elevation:* 6,100 to 6,700 feet  
*Average annual precipitation:* About 7 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Fawin fine sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy, mixed, mesic)—50 percent
- Crunker loamy sand, 2 to 15 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, sandy loam, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Xeric Torriorthents, gravelly sand, 8 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Xerollic Haplargids, fine sand, 2 to 8 percent slopes (Xerollic Haplargids, coarse-loamy, mixed, mesic)—2 percent
- Inclusion 4: Typic Torriorthents, very gravelly sandy loam, 2 to 8 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent

### **Characteristics of the Fawin Soil**

*Position on landscape:* Inset fans, fan aprons, and fan skirts  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Indian ricegrass, winterfat, bud sagebrush

### **Typical Profile**

- 0 to 5 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-7
- 5 to 11 inches—fine sandy loam, sandy loam; 10 to 20 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 11 to 34 inches—loamy sand, sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 34 to 60 inches—gravelly coarse sand, gravelly sand, gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Crunker Soil**

*Position on landscape:* Fan aprons and inset fans at higher elevations  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—convex and concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### Typical Profile

0 to 12 inches—loamy sand; 10 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

12 to 60 inches—stratified gravelly coarse sand to extremely gravelly sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fans

*Contrasting features:* No development throughout the profile, lower water-supplying capacity, averages more than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Spiny hopsage, bud sagebrush, Nevada ephedra

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Fan piedmont remnants

*Contrasting features:* Layer of clay accumulation

#### Inclusion 4

*Position on landscape:* Remnants of inset fans

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* More clay throughout the profile

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Fawin Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Crunker Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair;

wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope, flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Fawin soil—IVs, irrigated, and VIIs, nonirrigated; Crunker soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Fawin soil—029X020N; Crunker soil—029X049N

### 1482—Fawin-Izo association

#### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,600 to 6,700 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Fawin gravelly fine sandy loam, 2 to 4 percent slopes (Typic Camborthids, sandy, mixed, mesic)—75 percent
- Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 2 to 4 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Typic Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Fawin Soil**

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Winterfat, Indian ricegrass

### **Typical Profile**

0 to 5 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

5 to 11 inches—fine sandy loam, sandy loam; 10 to 20 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

11 to 34 inches—loamy sand, sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

34 to 60 inches—gravelly coarse sand, gravelly sand, gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than

6); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels and fan aprons

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly concave and slightly convex

*Dominant present vegetation:* Rabbitbrush, burrobrush, shadscale, Nevada ephedra, Indian ricegrass

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded, higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Slightly higher remnants of inset fans  
*Contrasting features:* Averages more than 35 percent rock fragments between depths of 10 and 40 inches, rarely flooded  
*Distinctive present vegetation:* Spiny menodora, shadscale, galleta, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Fawin Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Fawin soil—IVs, irrigated, and VIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Fawin soil—029X020N; Izo soil—029X041N

## **1483—Fawin fine sandy loam, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Mountain-valley alluvial flats and fan skirts

*Elevation:* 5,500 to 6,300 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Fawin fine sandy loam, 0 to 2 percent slopes (Typic Camborthids, sandy, mixed, mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, fine sandy loam, 0 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—6 percent

- Inclusion 2: Izo gravelly loamy sand, 0 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

- Inclusion 3: Typic Torriorthents, very fine sandy loam, 0 to 2 percent slopes (Typic Torriorthents, fine-silty, mixed [calcareous], mesic)—2 percent

### **Characteristics of the Fawin Soil**

*Position on landscape:* Mountain-valley alluvial flats and fan skirts

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Winterfat, Indian ricegrass, bud sagebrush

### **Typical Profile**

0 to 5 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

5 to 11 inches—fine sandy loam, sandy loam; 10 to 20 percent pebbles (by weight); subangular blocky

structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

11 to 34 inches—loamy sand, sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2

34 to 60 inches—gravelly coarse sand, gravelly sand, gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.43; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan skirts at higher elevations

*Contrasting features:* No development throughout the profile

#### Inclusion 2

*Position on landscape:* Channels (mostly in Garfield Flat area)

*Contrasting features:* Averages more than 35 percent rock fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush, Nevada ephedra

#### Inclusion 3

*Position on landscape:* Alluvial flats (mostly in Garfield Flat area)

*Contrasting features:* Siltier textures throughout the profile

*Distinctive present vegetation:* Shadscale, Cooper wolfberry, black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Fawin Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 029X020N

## 1490—Rattleflat-Crunker association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 6,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### Composition

*Major components:*

- Rattleflat gravelly loamy sand, 2 to 15 percent slopes (Xerollic Haplargids, coarse-loamy, mixed, mesic)—55 percent

- Crunker loamy sand, 2 to 15 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, sandy loam, 2 to 15 percent slopes (Xerollic Camborthids, coarse-loamy, mixed, mesic)—8 percent

- Inclusion 2: Fawn fine sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy, mixed, mesic)—4 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Ratleflat Soil**

*Position on landscape:* Fan piedmont remnants  
*Parent material:* Kind—alluvium; source—predominantly granitic rock  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta;  
 Flat area—predominantly Douglas rabbitbrush in some locations

### **Typical Profile**

- 0 to 9 inches—gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 9 to 22 inches—gravelly sandy loam, gravelly coarse sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 22 to 60 inches—stratified very gravelly loamy sand to very gravelly coarse sand; 0 to 5 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Crunker Soil**

*Position on landscape:* Fan aprons and inset fans  
*Parent material:* Kind—alluvium; source—predominantly granitic rock  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

- 0 to 12 inches—loamy sand; 10 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 12 to 60 inches—stratified gravelly coarse sand to extremely gravelly sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Slightly higher inset fans  
*Contrasting features:* No layer of clay accumulation, less than 35 percent rock fragments

#### **Inclusion 2**

*Position on landscape:* Lower summits of fan piedmont remnants

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* No layer of clay accumulation or appreciable silica cementation, more carbonates throughout the profile

*Distinctive present vegetation:* Winterfat, Indian ricegrass

### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Rattleflat Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Crunker Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope, flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Rattleflat soil—IVe, irrigated, and VIIs, nonirrigated; Crunker soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Rattleflat soil—029X049N; Crunker soil—029X049N

## **1492—Rattleflat-Wiskiflat association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,400 to 6,100 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Rattleflat gravelly loamy sand, 2 to 8 percent slopes (Xerollic Haplargids, coarse-loamy, mixed, mesic)—65 percent

- Wiskiflat gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Wedlar gravelly loamy sand, 2 to 8 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—5 percent

- Inclusion 2: Stumble loamy sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent

- Inclusion 3: Durorthidic Xeric Torripsamments, loamy sand, 4 to 15 percent slopes (Durorthidic Xeric Torripsamments, mixed, mesic)—3 percent

- Inclusion 4: Rattleflat gravelly loamy sand, 8 to 15 percent slopes (Xerollic Haplargids, coarse-loamy, mixed, mesic)—2 percent

### **Characteristics of the Rattleflat Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—predominantly granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 9 inches—gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

9 to 22 inches—gravelly sandy loam, gravelly coarse sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

22 to 60 inches—stratified very gravelly loamy sand to very gravelly coarse sand; 0 to 5 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Wiskiflat Soil

*Position on landscape:* Inset fans

*Parent material:* Kind—alluvium; source—granitic rock with some influence from volcanic rocks

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass, Nevada ephedra

### Typical Profile

0 to 10 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); single grained; loose; neutral (pH 6.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

10 to 60 inches—stratified very gravelly sandy loam to very gravelly coarse sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Higher summits and nonburied relict summits of fan piedmont remnants

*Contrasting features:* Horizon of clay accumulation and appreciable silica cementation

#### Inclusion 2

*Position on landscape:* Sand sheets on leeward side of side slopes of fan piedmont remnants

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* Sandy throughout the profile

*Distinctive present vegetation:* Littleleaf horsebrush, fourwing saltbush, Indian ricegrass

#### Inclusion 3

*Position on landscape:* More stabilized sand sheet areas on fan piedmonts

*Contrasting features:* Sandy throughout the profile, horizon of appreciable silica cementation

*Distinctive present vegetation:* Nevada ephedra, needleandthread

#### Inclusion 4

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Rattleflat Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Wiskiflat Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, frost action  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Ratleflat soil—IVe, irrigated, and VIIs, nonirrigated; Wiskiflat soil—VIIs, nonirrigated  
*Range site:* Ratleflat soil—029X049N; Wiskiflat soil—027X067N

### **1500—Chuckridge-Crunker association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 6,100 to 6,600 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 115 days

#### **Composition**

*Major components:*

- Chuckridge gravelly sandy loam, 4 to 15 percent slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—70 percent
  - Crunker very gravelly sandy loam, 4 to 8 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Wrango gravelly coarse sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
  - Inclusion 2: Xerollic Haplargids, gravelly loam, 8 to 30 percent slopes (Xerollic Haplargids, fine, montmorillonitic, mesic)—4 percent
  - Inclusion 3: Unsel gravelly sandy loam, 2 to 4 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—3 percent
  - Inclusion 4: Rock outcrop—1 percent

#### **Characteristics of the Chuckridge Soil**

*Position on landscape:* Summits, shoulder slopes, and north-facing back slopes of fan piedmont remnants  
*Parent material:* Kind—alluvium; source—rhyolite and rhyolitic tuffs  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, Sandberg bluegrass

#### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 2 to 12 inches—gravelly loam, gravelly sandy clay loam, gravelly clay loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SC; estimated AASHTO classification—A-6  
 12 to 26 inches—indurated duripan  
 26 to 60 inches—very gravelly sandy loam, very gravelly loamy sand; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.1); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 7 to 14 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—moderately slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Crunker Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

#### **Typical Profile**

0 to 12 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

12 to 60 inches—stratified gravelly coarse sand to extremely gravelly sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Inactive channels and inset fans

*Contrasting features:* No horizon of appreciable silica cementation

*Distinctive present vegetation:* Black sagebrush, Indian ricegrass

##### **Inclusion 2**

*Position on landscape:* Shoulder slopes and south- and west-facing back slopes of fan piedmont remnants

*Slope features:* Length—very short; shape—convex

*Contrasting features:* No horizon of appreciable silica cementation

##### **Inclusion 3**

*Position on landscape:* Toe slopes of fan piedmont remnants

*Slope features:* Length—very short; shape—slightly convex

*Contrasting features:* No silica-cemented pan, lower water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

##### **Inclusion 4**

*Position on landscape:* Scattered small peaks on back slopes and shoulder slopes of fan piedmont remnants

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Chuckridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, cemented pan

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Crunker Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Chuckridge soil—VII<sub>s</sub>, nonirrigated; Crunker soil—IV<sub>s</sub>, irrigated, and VI<sub>s</sub>, nonirrigated

*Range site:* Chuckridge soil—027X008N; Crunker soil—029X049N

## 1510—Advokay-Budihol-Pumel association

### **Map Unit Setting**

*Position on landscape:* Hills and rock pediments

*Elevation:* 5,600 to 6,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Advokay sandy loam, 2 to 8 percent slopes (Typic Haplargids, loamy, mixed, mesic, shallow)—50 percent
- Budihol stony sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—20 percent
- Pumel gravelly sandy loam, 15 to 50 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, very gravelly sandy loam, 15 to 50 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—6 percent
- Inclusion 2: Chill stony sandy loam, 15 to 30 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—5 percent
- Inclusion 3: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Xeric Torriorthents, very gravelly coarse sand, 15 to 50 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Advokay Soil**

*Position on landscape:* Rock pediments

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass, galleta

*Percent of surface covered by rock fragments:* 10 percent pebbles

### **Typical Profile**

0 to 6 inches—sandy loam; 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—SM; estimated AASHTO classification—A-2

6 to 11 inches—gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, GC; estimated AASHTO classification—A-2

11 inches or more—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1.5 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Budihol Soil**

*Position on landscape:* West-, north-, and east-facing side slopes of hills

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, pine bluegrass

### **Typical Profile**

0 to 3 inches—stony sandy loam; 5 to 15 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—gravelly coarse sandy loam, gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

7 to 21 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Pumel Soil

*Position on landscape:* South-facing side slopes of hills  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Spiny menodora, shadscale, Bailey greasewood, galleta, Indian ricegrass, Nevada ephedra

### Typical Profile

0 to 2 inches—gravelly sandy loam; 0 to 15 percent cobbles and stones, 30 to 50 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 2 to 5 inches—very gravelly coarse sandy loam, extremely gravelly sandy loam; 10 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1  
 5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of hills on limestone  
*Slope features:* Length—short; shape—convex  
*Contrasting features:* More carbonates throughout the profile, more than 35 percent rock fragments throughout the profile

#### Inclusion 2

*Position on landscape:* Side slopes and crests of north-facing hills  
*Contrasting features:* Layer of clay accumulation, higher water-supplying capacity

#### Inclusion 3

*Position on landscape:* Channels on pediments at lower elevations  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### Inclusion 4

*Position on landscape:* Steep channels  
*Slope features:* Length—short; shape—concave  
*Contrasting features:* Bedrock at a depth of more than 20 inches, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

**Other inclusions (in only a few areas):** Rock outcrop  
*Position on landscape:* Scattered rounded peaks, mostly on hill crests and shoulder slopes  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Advokay Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Severe—too arid, droughty, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Moderate—depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Budihol Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Pumel Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer, seepage

**Interpretive Groups**

*Capability classification:* Advokay soil—VIIIs, nonirrigated; Budihol soil—VIIIs, nonirrigated; Pumel soil—VIIIs, nonirrigated  
*Range site:* Advokay soil—029X017N; Budihol soil—027X007N; Pumel soil—029X037N

**1511—Advokay sandy loam, moist, 2 to 8 percent slopes****Map Unit Setting**

*Position on landscape:* Rock pediments  
*Elevation:* 5,500 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 125 days

**Composition**

*Major components:*  
 • Advokay sandy loam, moist, 2 to 8 percent slopes (Typic Haplargids, loamy, mixed, mesic, shallow)—90 percent  
*Contrasting inclusions:*  
 • Inclusion 1: Typic Torriorthents, sandy loam, 2 to 8 percent slopes (Typic Torriorthents, fine-loamy, mixed, mesic)—5 percent  
 • Inclusion 2: Lithic Torriorthents, gravelly sandy loam, 2

to 8 percent slopes (Lithic Torriorthents, loamy, mixed, mesic)—3 percent

- Inclusion 3: Inmo very gravelly loamy sand, occasionally flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—1 percent
- Inclusion 4: Rock outcrop—1 percent

**Characteristics of the Advokay Soil**

*Position on landscape:* Rock pediments  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Indian ricegrass, galleta

**Typical Profile**

0 to 3 inches—sandy loam; 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 3 to 7 inches—gravelly sandy clay loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, GC; estimated AASHTO classification—A-2  
 7 inches or more—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* Less than 1.5 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Alluvial fans  
*Slope features:* Length—long; shape—slightly convex  
*Contrasting features:* Bedrock at a depth of more than

60 inches, no layer of clay accumulation

*Distinctive present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* Rock pediments

*Contrasting features:* Hard bedrock within a depth of 20 inches, no layer of clay accumulation

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Spiny hopsage, Nevada ephedra, Indian ricegrass, galleta

#### **Inclusion 4**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Advokay Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X036N

## **1530—Dakent-Crunker association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,800 to 6,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Dakent gravelly very fine sandy loam, 4 to 15 percent

slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—60 percent

- Crunker gravelly sandy loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Gabbvally gravelly sandy loam, moist, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—9 percent
- Inclusion 2: Xeric Torriorthents, gravelly coarse sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Xerollic Camborthids, gravelly sandy loam, 2 to 15 percent slopes (Xerollic Camborthids, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Dakent Soil**

*Position on landscape:* Summits and south-facing shoulder slopes of fan piedmont remnants

*Parent material:* Kind—alluvium; source—predominantly limestone

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, pine bluegrass, galleta

### **Typical Profile**

0 to 3 inches—gravelly very fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 to 11 inches—gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2, A-4

11 to 34 inches—extremely gravelly sandy loam, extremely gravelly loam; 5 to 10 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; extremely hard, very firm; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

34 to 60 inches—extremely gravelly coarse sand, extremely gravelly sand, extremely gravelly loamy sand; 5 to 10 percent cobbles and stones, 75 to 85

percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Crunker Soil

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### Typical Profile

0 to 12 inches—gravelly sandy loam; 5 to 10 percent cobbles and stones, 30 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 12 to 60 inches—stratified gravelly coarse sand to extremely gravelly sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid

*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Hills  
*Contrasting features:* Bedrock within a depth of 20 inches

#### Inclusion 2

*Position on landscape:* Channels  
*Contrasting features:* No development throughout the profile, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Highest inset fans and north-facing side slopes of fan piedmont remnants  
*Contrasting features:* No horizon of appreciable silica cementation

### Major Uses

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Dakent Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor  
*Range seeding:* Fair—too arid, too crusty  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope, frost action  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Crunker Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Dakent soil—IVe, irrigated, and VIIs, nonirrigated; Crunker soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Dakent soil—029X006N; Crunker soil—029X049N

## **1540—Beano-Annaw association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Beano sandy loam, 2 to 8 percent slopes (Haplic Durargids, loamy-skeletal, mixed, mesic, shallow)—50 percent

- Annaw gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—8 percent

- Inclusion 2: Xeric Torriorthents, gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Unsel very gravelly sandy loam, 2 to 8 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—3 percent

### **Characteristics of the Beano Soil**

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### **Typical Profile**

0 to 7 inches—sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

7 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

18 to 35 inches—strongly cemented duripan

35 to 60 inches—stratified extremely gravelly coarse sand to extremely gravelly loamy sand; 0 to 10 percent cobbles and stones, 70 to 85 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 15 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—very rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Annaw Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

**Typical Profile**

- 0 to 2 inches—gravelly sandy loam; 0 to .10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Channels  
*Contrasting features:* No development throughout the profile, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, burrobrush

**Inclusion 2**

- Position on landscape:* Lower back slopes of fan piedmont remnants; channels at higher elevations

- Slope features:* Length—short; shape—slightly concave  
*Contrasting features:* No development throughout the profile, higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, galleta, Nevada ephedra

**Inclusion 3**

- Position on landscape:* Lower summits of fan piedmont remnants  
*Contrasting features:* Layer of clay accumulation, no silica-cemented pan

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Beano Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, soil blowing  
*Shallow excavations:* Severe—cemented pan, cutbanks cave  
*Local roads and streets:* Moderate—cemented pan  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Annaw Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

- Capability classification:* Beano soil—VIIs, nonirrigated; Annaw soil—VIIs, nonirrigated  
*Range site:* Beano soil—029X017N; Annaw soil—029X036N

**1551—Typic Torriorthents-Unsel association****Map Unit Setting**

- Position on landscape:* Fan piedmonts  
*Elevation:* 5,800 to 6,300 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 52 degrees F  
*Frost-free season:* About 115 days

### Composition

#### Major components:

- Typic Torriorthents, very gravelly sandy loam, 15 to 50 percent slopes—55 percent
- Unsel very gravelly loam, 4 to 15 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—30 percent

#### Contrasting inclusions:

- Inclusion 1: Annaw gravelly sandy loam, 2 to 15 percent slopes (Typic Camborthids, loamy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Izo extremely gravelly loamy sand, 4 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Typic Torriorthents, cobbly, sandy loam, 15 to 50 percent slopes—3 percent

### Characteristics of the Typic Torriorthents

*Position on landscape:* Back slopes of fan piedmont remnants and partial ballenas

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### Reference Profile

0 to 6 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Characteristics of the Unsel Soil

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, bud sagebrush, Indian ricegrass

### Typical Profile

0 to 4 inches—very gravelly loam; 15 to 30 percent cobbles and stones, 40 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2

4 to 10 inches—gravelly sandy clay loam, gravelly clay loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6

10 to 31 inches—gravelly sandy loam, gravelly sandy clay loam; 30 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2

31 to 60 inches—very gravelly sand, very gravelly loamy sand, extremely gravelly sand; 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—3; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans  
*Contrasting features:* No layer of clay accumulation, rarely flooded

#### **Inclusion 2**

*Position on landscape:* Channels  
*Contrasting features:* No layer of clay accumulation, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### **Inclusion 3**

*Position on landscape:* Fan piedmont remnants and back slopes of partial ballenas  
*Contrasting features:* 15 to 35 percent cobbles on the surface

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Typic Torriorthents for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Unsel Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, small stones, too crusty  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Typic Torriorthents—VIIs, nonirrigated; Unsel soil—VIIs, nonirrigated

*Range site:* Typic Torriorthents—029X033N; Unsel soil—29X017N

## **1570—Budihol-Uripnes-Petspring association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,000 to 6,200 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Budihol gravelly sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—40 percent
- Uripnes very stony sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—25 percent
- Petspring very gravelly coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—10 percent
- Inclusion 2: Chill very gravelly sandy loam, 15 to 50 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—3 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic, shallow)—2 percent

### **Characteristics of the Budihol Soil**

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Sandberg bluegrass

### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 10 inches—gravelly coarse sandy loam, gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

10 inches—weathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### Characteristics of the Uripnes Soil

*Position on landscape:* South-facing side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass  
*Percent of surface covered by rock fragments:* 8 percent stones

#### Typical Profile

0 to 3 inches—very stony sandy loam; 20 to 35 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* Weathered bedrock at 3 to 8 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None

*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

#### Characteristics of the Petspring Soil

*Position on landscape:* South-facing side slopes of mountains at higher elevations  
*Parent material:* Kind—colluvium and residuum; source—granitic rock  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

#### Typical Profile

0 to 1 inch—very gravelly coarse sandy loam; 0 to 20 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SG; estimated AASHTO classification—A-1

1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 inches—weathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 3 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Crests of mountains and rock pediment remnants

*Contrasting features:* Layer of clay accumulation, slopes of less than 50 percent

#### **Inclusion 3**

*Position on landscape:* Side slopes of mountains at the highest elevations

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Budihol Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Uripnes Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Petspring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Budihol soil—VIIIs, nonirrigated;

Uripnes soil—VIIIs, nonirrigated; Petspring soil—VIIIs, nonirrigated

*Range site:* Budihol soil—027X007N; Uripnes soil—027X047N; Petspring soil—027X065N

## **1580—Rockabin-Hiridge association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 8,000 to 10,500 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 42 degrees F

*Frost-free season:* About 75 days

### **Composition**

*Major components:*

- Rockabin very gravelly coarse sandy loam, 15 to 50 percent slopes (Typic Cryoborolls, loamy-skeletal, mixed)—70 percent

- Hiridge very gravelly sandy loam, 8 to 30 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Fusuvar stony sandy loam, 8 to 30 percent slopes (Typic Cryoborolls, loamy, mixed, shallow)—7 percent

- Inclusion 2: Snopoc very stony coarse sandy loam, 8 to 50 percent slopes (Pachic Cryoborolls, loamy-skeletal, mixed)—5 percent

- Inclusion 3: Rock outcrop—3 percent

### **Characteristics of the Rockabin Soil**

*Position on landscape:* Shoulder slopes and back slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, prairie junegrass, Letterman needlegrass, Sandberg bluegrass

*Percent of surface covered by rock fragments:* 30 percent pebbles, 15 percent cobbles, 5 percent stones

### Typical Profile

0 to 8 inches—very gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

8 to 21 inches—very gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

21 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 3 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Hiridge Soil

*Position on landscape:* Upper shoulder slopes and crests of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, prairie junegrass, buckwheat

### Typical Profile

0 to 4 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70

percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Small areas adjacent to rock outcrop and crests of mountains

*Slope features:* Length—short; shape—concave

*Contrasting features:* Less than 35 percent rock fragments throughout the profile, higher water-supplying capacity

*Distinctive present vegetation:* Curlleaf mountainmahogany

#### Inclusion 2

*Position on landscape:* Snow pockets and steeper north-facing back slopes of mountains

*Slope features:* Shape—concave

*Contrasting features:* More organic matter in upper profile, higher water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush

#### Inclusion 3

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Rockabin Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—small stones  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—small stones, droughty  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Rockabin soil—VIIs, nonirrigated; Hiridge soil—VIIs, nonirrigated  
*Range site:* Rockabin soil—026X028N; Hiridge soil—026X028N

### **1590—Snopoc-Rockabin-Fusuvar association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 8,400 to 10,000 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 42 degrees F  
*Frost-free season:* About 75 days

#### **Composition**

##### *Major components:*

- Snopoc stony coarse sandy loam, 50 to 75 percent slopes (Pachic Cryoborolls, loamy-skeletal, mixed)—40 percent
- Rockabin very gravelly coarse sandy loam, 50 to 75 percent slopes (Typic Cryoborolls, loamy-skeletal, mixed)—30 percent
- Fusuvar very bouldery sandy loam, 30 to 75 percent slopes (Typic Cryoborolls, loamy, mixed, shallow)—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Rockabin very gravelly coarse sandy loam, 30 to 50 percent slopes (Typic Cryoborolls, loamy-skeletal, mixed)—7 percent
- Inclusion 2: Rock outcrop—3 percent

#### **Characteristics of the Snopoc Soil**

*Position on landscape:* North-facing back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, Thurber needlegrass, pine bluegrass, eriogonum

#### **Typical Profile**

0 to 17 inches—stony coarse sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 17 to 60 inches—extremely gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 70 to 90 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM, SP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 16 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—high; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### **Characteristics of the Rockabin Soil**

*Position on landscape:* Back slopes of mountains  
*Parent material:* Kind—colluvium and residuum; source—granitic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, prairie junegrass, Letterman needlegrass, Sandberg bluegrass

#### **Typical Profile**

0 to 8 inches—very gravelly coarse sandy loam; 0 to 10

percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

8 to 21 inches—very gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

21 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 3 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Very rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—high; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Fusuvar Soil

*Position on landscape:* Shoulder slopes and pockets on back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Curleaf mountainmahogany, snowberry, basin wildrye, Nevada bluegrass

*Percent of surface covered by rock fragments:* 20 percent pebbles, 5 percent stones, 5 percent boulders

### Typical Profile

0 to 2 inches—very bouldery sandy loam; 10 to 20 percent boulders, stones, and cobbles, 10 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; medium acid (pH 6.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 14 inches—gravelly coarse sandy loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

14 to 20 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 2 inches

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—high; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—moderate

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulder slopes of mountains

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Slopes of less than 50 percent, more than 35 percent rock fragments throughout the profile

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Snopoc Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Rockabin Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—small stones  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Fusuvar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer, seepage

#### **Interpretive Groups**

*Capability classification:* Snopoc soil—VIIs, nonirrigated; Rockabin soil—VIIs, nonirrigated; Fusuvar soil—VIIe, nonirrigated  
*Range site:* Snopoc soil—026X038N; Rockabin soil—026X028N; Fusuvar soil—026X009N

### **1591—Snopoc-Rockabin-Hiridge association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 8,400 to 10,500 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 42 degrees F  
*Frost-free season:* About 75 days

#### **Composition**

*Major components:*

- Snopoc very gravelly coarse sandy loam, 50 to 75 percent slopes (Pachic Cryoborolls, loamy-skeletal, mixed)—45 percent
- Rockabin very gravelly coarse sandy loam, 30 to 50 percent slopes (Typic Cryoborolls, loamy-skeletal, mixed)—30 percent
- Hiridge very gravelly sandy loam, 15 to 50 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Fusuvar very gravelly coarse sandy loam, 8 to 50 percent slopes (Typic Cryoborolls, loamy, mixed, shallow)—5 percent
- Inclusion 2: Rock outcrop—5 percent

#### **Characteristics of the Snopoc Soil**

*Position on landscape:* Back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, Thurber needlegrass, pine bluegrass, eriogonum

#### **Typical Profile**

0 to 17 inches—very gravelly coarse sandy loam; 0 to 5 percent cobbles and stones, 55 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1  
 17 to 60 inches—extremely gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 70 to 90 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM, SP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 16 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### **Characteristics of the Rockabin Soil**

*Position on landscape:* Lower shoulder slopes and back slopes of mountains  
*Parent material:* Kind—colluvium and residuum; source—granitic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Low sagebrush, prairie junegrass, Letterman needlegrass, Sandberg bluegrass

#### **Typical Profile**

0 to 8 inches—very gravelly coarse sandy loam; 0 to 10

percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

8 to 21 inches—very gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

21 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 3 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Hiridge Soil

*Position on landscape:* Crests and upper shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum

### Typical Profile

0 to 4 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline

(less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Back slopes and shoulder slopes of mountains

*Slope features:* Length—short; shape—concave

*Contrasting features:* Averages less than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Curleaf mountainmahogany

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Snopoc Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—small stones, droughty

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Rockabin Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—small stones  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Snopoc soil—VIIs, nonirrigated; Rockabin soil—VIIs, nonirrigated; Hiridge soil—VIIs, nonirrigated  
*Range site:* Snopoc soil—026X038N; Rockabin soil—26X028N; Hiridge soil—026X028N

### **1600—Nupart-Lazan-Rock outcrop association**

#### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,200 to 8,400 feet  
*Average annual precipitation:* About 13 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 100 days

#### **Composition**

##### *Major components:*

- Nupart very gravelly loamy sand, 50 to 75 percent slopes (Entic Haploxerolls, sandy-skeletal, mixed, frigid, shallow)—40 percent
- Lazan very gravelly coarse sand, 50 to 75 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—30 percent
- Rock outcrop—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Snopoc very stony coarse sandy loam, 30 to 75 percent slopes (Pachic Cryoborolls, loamy-skeletal, mixed)—5 percent
- Inclusion 2: Typic Argixerolls, very gravelly loamy sand, 15 to 50 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid, shallow)—5 percent

#### **Characteristics of the Nupart Soil**

*Position on landscape:* North-facing back slopes of mountains and south-facing back slopes of mountains at the highest elevations  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, pine bluegrass, antelope bitterbrush

#### **Typical Profile**

0 to 2 inches—very gravelly loamy sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 2 to 5 inches—very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1  
 5 to 20 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 10 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—high; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

#### **Characteristics of the Lazan Soil**

*Position on landscape:* South-facing back slopes of mountains  
*Parent material:* Kind—colluvium; source—granitic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, desert needlegrass, antelope bitterbrush

*Percent of surface covered by rock fragments:* 60 percent pebbles, 5 percent cobbles, 1 percent stones

### Typical Profile

0 to 1 inch—very gravelly coarse sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1

1 to 4 inches—very gravelly loamy coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

4 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—high; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing back slopes of mountains at upper elevations

*Slope features:* Length—short; shape—concave

*Contrasting features:* Higher water-supplying capacity, colder soil temperature

*Distinctive present vegetation:* Mountain big sagebrush

#### Inclusion 2

*Position on landscape:* Mountain crests and shoulder slopes and back slopes of mountains near geologic contact zones in the Wassuk Range

*Contrasting features:* Layer of clay accumulation, slopes of less than 50 percent

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

### Major Uses

**Current uses:** Woodland, rangeland, wildlife habitat

#### Woodland

*Site index for singleleaf pinyon:* Nupart—40; Lazan—38

*Most important native understory plants:* Nupart—mountain big sagebrush, antelope bitterbrush, green ephedra, pine bluegrass, needlegrass, bottlebrush squirreltail, Indian ricegrass; Lazan—desert needlegrass, antelope bitterbrush, Wyoming big sagebrush, Indian ricegrass, rabbitbrush

#### Ratings of the Nupart Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, too sandy, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Lazan Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, too sandy, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, seepage

### Interpretive Groups

*Capability classification:* Nupart soil—VIIIs, nonirrigated; Lazan soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Woodland suitability group:* Nupart soil—2R; Lazan soil—1R

**1601—Nupart-Rock outcrop association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,500 to 8,300 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 100 days

**Composition**

*Major components:*

- Nupart very gravelly coarse sandy loam, 15 to 50 percent slopes (Entic Haploxerolls, sandy-skeletal, mixed, frigid, shallow)—65 percent

- Rock outcrop—25 percent

*Contrasting inclusions:*

- Inclusion 1: Petspring very gravelly coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—6 percent

- Inclusion 2: Lazan very gravelly coarse sandy loam, 50 to 75 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—3 percent

- Inclusion 3: Xerollic Camborthids, gravelly sandy loam, 4 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, frigid)—1 percent

**Characteristics of the Nupart Soil**

*Position on landscape:* Summits and side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, pine bluegrass, antelope bitterbrush

**Typical Profile**

0 to 2 inches—very gravelly coarse sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 5 inches—very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

5 to 20 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 10 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

**Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* South-facing side slopes of mountains at lower elevations

*Contrasting features:* Lower water-supplying capacity, less organic matter throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, desert needlegrass

**Inclusion 2**

*Position on landscape:* North-facing side slopes of mountains at lower elevations

*Contrasting features:* Slopes of more than 50 percent, lower water-supplying capacity, less organic matter throughout the profile

*Distinctive present vegetation:* Singleleaf pinyon, Wyoming big sagebrush

**Inclusion 3**

*Position on landscape:* Intermontane basins

*Slope features:* Shape—slightly concave

*Contrasting features:* Slopes of less than 8 percent, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

**Woodland**

*Site index for singleleaf pinyon:* Nupart soil—40

*Most important native understory plants:* Nupart soil—mountain big sagebrush, antelope bitterbrush, pine bluegrass, needlegrass, green ephedra, bottlebrush squirreltail, Indian ricegrass

### Ratings of the Nupart Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, too sandy, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Nupart soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Woodland suitability group:* Nupart soil—1R

## 1632—Annaw-Wardenot-Pintwater association

### Map Unit Setting

*Position on landscape:* Fan piedmonts and hills

*Elevation:* 5,000 to 5,800 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Annaw very gravelly loamy sand, dry, 4 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—35 percent

- Wardenot very gravelly loamy sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—25 percent

- Pintwater very gravelly fine sandy loam, 4 to 15 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Candelaria very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Izo very gravelly sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Pintwater very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

### Characteristics of the Annaw Soil

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass, galleta

### Typical Profile

0 to 2 inches—very gravelly loamy sand; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Wardenot Soil

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass, galleta

### Typical Profile

0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Pintwater Soil

*Position on landscape:* Hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta

### Typical Profile

0 to 6 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 11 inches—extremely gravelly sandy loam, very gravelly fine sandy loam; 0 to 15 percent cobbles and stones, 60 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Highest summits of fan piedmont remnants

*Contrasting features:* Layer of lime accumulation at a depth of 1 to 6 inches, bedrock at a depth of more than 60 inches

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* Hills

*Contrasting features:* Slopes of more than 15 percent, bedrock within a depth of 20 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Annaw Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand*: Probable source

*Gravel*: Probable source

*Embankments, dikes, and levees*: Severe—seepage

#### **Ratings of the Wardenot Soil for Various Uses**

*Wildlife habitat elements*: Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding*: Poor—too arid, droughty, small stones

*Shallow excavations*: Severe—cutbanks cave

*Local roads and streets*: Moderate—flooding, large stones

*Roadfill*: Fair—large stones

*Sand*: Probable source

*Gravel*: Probable source

*Embankments, dikes, and levees*: Severe—seepage, large stones

#### **Ratings of the Pintwater Soil for Various Uses**

*Wildlife habitat elements*: Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding*: Poor—too arid, droughty, small stones

*Shallow excavations*: Severe—depth to bedrock

*Local roads and streets*: Severe—depth to bedrock

*Roadfill*: Poor—depth to bedrock

*Sand*: Improbable source—excess fines

*Gravel*: Improbable source—excess fines

*Embankments, dikes, and levees*: Severe—thin layer, seepage

#### **Interpretive Groups**

*Capability classification*: Annaw soil—VIIIs, nonirrigated;

Wardenot soil—VIIIs, nonirrigated; Pintwater soil—VIIIs, nonirrigated

*Range site*: Annaw soil—029X017N; Wardenot soil—029X017N; Pintwater soil—029X037N

### **1641—Unsel-Annaw association**

#### **Map Unit Setting**

*Position on landscape*: Fan piedmonts

*Elevation*: 5,000 to 6,000 feet

*Average annual precipitation*: About 6 inches

*Average annual air temperature*: About 53 degrees F

*Frost-free season*: About 130 days

#### **Composition**

*Major components*:

- Unsel very gravelly fine sandy loam, 4 to 30 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—70 percent

- Annaw gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—15 percent

#### **Contrasting inclusions:**

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Typic Torriorthents, very gravelly loamy sand, 8 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent

- Inclusion 3: Goldyke gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—1 percent

- Inclusion 4: Breko gravelly sandy loam, 8 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—1 percent

#### **Characteristics of the Unsel Soil**

*Position on landscape*: Summits of fan piedmont remnants

*Parent material*: Mixed alluvium

*Slope features*: Length—long; shape—convex

*Dominant present vegetation*: Bailey greasewood, shadscale, galleta, bud sagebrush

#### **Typical Profile**

0 to 5 inches—very gravelly fine sandy loam; 15 to 30 percent cobbles and stones, 40 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2

5 to 11 inches—gravelly sandy clay loam, gravelly clay loam; 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6

11 to 30 inches—gravelly sandy loam, gravelly sandy clay loam; 30 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2

30 to 60 inches—very gravelly sand, very gravelly loamy sand, extremely gravelly sand; 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—3; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Annaw Soil**

*Position on landscape:* Inset fans and toe slopes of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly concave to slightly convex  
*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

**Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2  
 11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Inclusion 2**

*Position on landscape:* Eroded back slopes of fan piedmont remnants  
*Slope features:* Length—very short; shape—concave  
*Contrasting features:* No development throughout the profile, lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale

**Inclusion 3**

*Position on landscape:* Exposed hills on back slopes of fan piedmont remnants (mostly in Broken Hills and Mt. Anna areas)  
*Slope features:* Length—very short; shape—convex  
*Contrasting features:* Bedrock within a depth of 20 inches

**Inclusion 4**

*Position on landscape:* North-facing back slopes of fan piedmont remnants at higher elevations  
*Contrasting features:* Layer of clay accumulation, no layer of appreciable silica cementation, higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, galleta, Indian ricegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Unsel Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Too arid, small stones, too crusty

*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Annaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Unsel soil—VIIs, nonirrigated; Annaw soil—VIIs, nonirrigated  
*Range site:* Unsel soil—029X017N; Annaw soil—029X036N

### **1643—Unsel-Annaw-Izo association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,800 to 5,800 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

#### **Composition**

*Major components:*

- Unsel very gravelly fine sandy loam, 2 to 8 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—55 percent
- Annaw gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—25 percent
- Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Unsel very gravelly fine sandy loam, 8 to 15 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—5 percent
- Inclusion 2: Goldyke gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed, mesic, shallow)—5 percent

#### **Characteristics of the Unsel Soil**

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, bud sagebrush

#### **Typical Profile**

- 0 to 4 inches—very gravelly fine sandy loam; 15 to 30 percent cobbles and stones, 40 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-2
- 4 to 10 inches—gravelly sandy clay loam, gravelly clay loam; 25 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-6
- 10 to 31 inches—gravelly sandy loam, gravelly sandy clay loam; 30 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2
- 31 to 60 inches—very gravelly sand, very gravelly loamy sand, extremely gravelly sand; 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—3; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Annaw Soil**

*Position on landscape:* Inset fans and inset fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass, galleta

### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Burrobrush, shadscale, Bailey greasewood, Indian ricegrass

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Side slopes of fan remnants

*Contrasting features:* Slopes of more than 8 percent

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Low hills

*Contrasting features:* Slopes of more than 8 percent, soft bedrock within a depth of 10 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Unsel Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones, too crusty

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Annaw Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Izo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Unsel soil—VIIIs, nonirrigated;

Annaw soil—VIIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Unsel soil—029X017N; Annaw soil—029X036N; Izo soil—029X041N

## 1670—Bouncer gravelly loamy fine sand, 15 to 50 percent slopes

### Map Unit Setting

*Position on landscape:* Mountains and hills

*Elevation:* 6,100 to 7,500 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 105 days

### Composition

#### Major components:

- Bouncer gravelly loamy fine sand, 15 to 50 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—85 percent

#### Contrasting inclusions:

- Inclusion 1: Lithic Xeric Torriorthents, gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, mesic)—9 percent
- Inclusion 2: Rock outcrop—2 percent
- Inclusion 3: Xerollic Haplargids, very gravelly sandy loam, 4 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Typic Xerorthents, very gravelly sandy loam, 2 to 15 percent slopes (Typic Xerorthents, loamy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Bouncer Soil

*Position on landscape:* Crests and side slopes of hills and mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush, pine bluegrass

### Typical Profile

0 to 3 inches—gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-1

3 to 10 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

10 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 8 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded back slopes of hills and mountains

*Contrasting features:* Hard bedrock within a depth of 14 inches, slopes of more than 50 percent, no layer of clay accumulation

#### **Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Inclusion 3**

*Position on landscape:* Alluvial fans

*Contrasting features:* Bedrock at a depth of more than 60 inches

#### **Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Woodland, wildlife habitat

#### **Woodland**

*Site index for common trees:* Singleleaf pinyon—42; Utah juniper—42

*Most important native understory plants:* Wyoming big sagebrush, pine bluegrass

#### **Ratings of the Bouncer Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* VIIIs

*Woodland suitability group:* 1R

### **1680—Lazan-Lazan, very steep-Nupart association**

#### **Map Unit Setting**

*Position on landscape:* Rock pediments

*Elevation:* 6,000 to 8,000 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 100 days

#### **Composition**

*Major components:*

- Lazan gravelly loamy sand, 8 to 30 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—40 percent
- Lazan gravelly loamy sand, 50 to 75 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—25 percent
- Nupart very gravelly loamy sand, 50 to 75 percent slopes (Entic Haploxerolls, sandy-skeletal, mixed, frigid, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Petspring very gravelly loamy coarse sand, 30 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—8 percent
- Inclusion 2: Rock outcrop—4 percent
- Inclusion 3: Xerollic Haplargids, very gravelly sandy loam, 4 to 30 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—2 percent
- Inclusion 4: Typic Xerorthents, very gravelly loamy sand, 2 to 15 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic)—1 percent

#### **Characteristics of the Less Sloping Lazan Soil**

*Position on landscape:* Summits and shoulder slopes of rock pediment remnants

*Parent material:* Kind—colluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, desert needlegrass, antelope bitterbrush

#### **Typical Profile**

0 to 1 inch—gravelly loamy sand; 0 to 10 percent cobbles and stones, 35 to 50 percent pebbles (by

weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

1 to 4 inches—very gravelly loamy coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

4 inches—weathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

#### Characteristics of the Very Steep Lazan Soil

*Position on landscape:* South-facing back slopes of rock pediment remnants

*Parent material:* Kind—colluvium; source—granitic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, desert needlegrass, antelope bitterbrush

#### Typical Profile

0 to 1 inch—gravelly loamy sand; 0 to 10 percent cobbles and stones, 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

1 to 4 inches—very gravelly loamy coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and

stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

4 inches—weathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

#### Characteristics of the Nupart Soil

*Position on landscape:* North-facing back slopes of rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, pine bluegrass, antelope bitterbrush

#### Typical Profile

0 to 2 inches—very gravelly loamy sand; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 5 inches—very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

5 to 20 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 10 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* South-facing back slopes of rock pediment remnants at lower elevations

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, desert needlegrass

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Summits of rock pediment remnants

*Contrasting features:* Layer of clay accumulation

#### Inclusion 4

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Other inclusions (in only a few areas):** Xerollic Haplargids, 4 to 30 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)

*Location:* Small areas southwest of Corey Peak

*Position on landscape:* Summits and shoulder slopes of rock pediments

*Contrasting features:* Layer of clay accumulation

*Distinctive present vegetation:* Singleleaf pinyon, low sagebrush

### Major Uses

**Current uses:** Wildlife habitat, woodland

### Woodland

*Site index for singleleaf pinyon:* Lazan soils—38; Nupart soil—40

*Most important native understory plants:* Wyoming big sagebrush, desert needlegrass, antelope bitterbrush

### Ratings of the Less Sloping Lazan Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Fair—droughty, too sandy

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, seepage

### Ratings of the Very Steep Lazan Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Droughty, too sandy

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, seepage

### Ratings of the Nupart Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, too sandy, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Lazan soil—VIIIs, nonirrigated; very steep Lazan soil—VIIIs, nonirrigated; Nupart soil—VIIIs, nonirrigated

*Woodland suitability group:* Lazan soil—1D; very steep Lazan soil—1R; Nupart soil—1R

## 1691—Crunkvar-Lazan association

### Map Unit Setting

*Position on landscape:* Mountain-valley fans and rock pediments

*Elevation:* 6,600 to 7,800 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 48 degrees F

*Frost-free season:* About 105 days

### Composition

*Major components:*

- Crunkvar gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—65 percent
  - Lazan gravelly loamy sand, 8 to 30 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—20 percent
- Contrasting inclusions:*
- Inclusion 1: Xeric Torriorthents, stony sand, 8 to 30 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
  - Inclusion 2: Xeric Torriorthents, stony sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
  - Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent
  - Inclusion 4: Xerollic Haplargids, gravelly fine sandy loam, 4 to 15 percent slopes (Xeric Haplargids, fine-loamy, mixed, mesic)—2 percent

### Characteristics of the Crunkvar Soil

*Position on landscape:* Mountain-valley fans

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Indian ricegrass

### Typical Profile

- 0 to 10 inches—gravelly loamy sand; 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 10 to 60 inches—stratified gravelly coarse sandy loam to very gravelly sand; 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### Characteristics of the Lazan Soil

*Position on landscape:* Rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, desert needlegrass, antelope bitterbrush

### Typical Profile

- 0 to 1 inch—gravelly loamy sand; 0 to 10 percent cobbles and stones, 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 1 to 4 inches—very gravelly loamy coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1
- 4 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Fan collars  
*Contrasting features:* Bedrock at a depth of more than 60 inches, more stones on the surface, more rock fragments 5 to 75 millimeters in size throughout the profile

#### **Inclusion 2**

*Position on landscape:* Interfan valleys  
*Contrasting features:* Bedrock at a depth of more than 60 inches, more stones on the surface, more rock fragments 5 to 75 millimeters in size throughout the profile

#### **Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### **Inclusion 4**

*Position on landscape:* Slightly higher alluvial fan remnants  
*Contrasting features:* Layer of clay accumulation, bedrock at a depth of more than 60 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

#### **Woodland**

*Site index for singleleaf pinyon:* Lazan—38  
*Most important native understory plants:* Lazan—Wyoming big sagebrush, desert needlegrass

#### **Ratings of the Crunkvar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope, flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Lazan Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, too sandy, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Crunkvar soil—VIIs, nonirrigated; Lazan soil—VIIs, nonirrigated  
*Range site:* Crunkvar soil—029X049N  
*Woodland suitability group:* Lazan soil—1R

## **1700—Granmount-Kiote-Hiridge association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 8,400 to 10,000 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 42 degrees F  
*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Granmount very gravelly fine sandy loam, 30 to 50 percent slopes (Argic Cryoborolls, clayey-skeletal, mixed)—45 percent
- Kiote gravelly loam, 15 to 50 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal, mixed)—30 percent
- Hiridge very gravelly sandy loam, 15 to 50 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Hiridge very gravelly sandy loam, 4 to 15 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—6 percent
- Inclusion 2: Rock outcrop—4 percent

### **Characteristics of the Granmount Soil**

*Position on landscape:* Back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—andesite and related rocks  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum, needlegrass

### Typical Profile

- 0 to 10 inches—very gravelly fine sandy loam; 5 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2
- 10 to 33 inches—extremely gravelly clay, very gravelly clay; 10 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 33 to 60 inches—very cobbly clay loam; 40 to 50 percent cobbles and stones, 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Kiote Soil

*Position on landscape:* North- and east-facing summits of mountains  
*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic rocks  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, western needlegrass, snowberry, pine bluegrass

### Typical Profile

- 0 to 8 inches—gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight);

subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, SM-SC, GM-GC; estimated AASHTO classification—A-2, A-4

- 8 to 18 inches—very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

- 18 to 38 inches—very gravelly loam; 5 to 20 percent cobbles and stones, 55 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

- 38 to 60 inches—extremely gravelly loam, extremely gravelly sandy loam, extremely gravelly coarse sandy loam; 5 to 15 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2 mmhos/cm); estimated Unified classification—GP-GC, GP-GM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 6 inches  
*Water-supplying capacity:* About 16 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Hiridge Soil

*Position on landscape:* Back slopes and crests of mountains  
*Parent material:* Kind—residuum and colluvium; source—altered andesite  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Low sagebrush, pine bluegrass, erigonum

*Percent of surface covered by rock fragments:* 50 percent pebbles, 5 percent cobbles, 2 percent stones

#### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Shoulder slopes and crests of mountains

*Contrasting features:* Slopes of less than 15 percent

##### **Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Granmount Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—small stones

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Moderate—large stones

#### **Ratings of the Kiote Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Fair—erodes easily

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Granmount soil—VIIs,

nonirrigated; Kiote soil—VIIe, nonirrigated; Hiridge soil—VIIs, nonirrigated

*Range site:* Granmount soil—026X028N; Kiote soil—026X038N; Hiridge soil—026X028N

### **1710—Troutville Variant very bouldery sandy loam, 30 to 75 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 9,200 to 10,500 feet

*Average annual precipitation:* About 16 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 75 days

## Composition

### Major components:

- Troutville Variant very bouldery sandy loam, 30 to 75 percent slopes (Psammentic Cryoboralfs, loamy-skeletal, mixed)—85 percent

### Contrasting inclusions:

- Inclusion 1: Pachic Cryoborolls, extremely stony loam, 50 to 75 percent slopes (Pachic Cryoborolls, loamy-skeletal, mixed)—8 percent
- Inclusion 2: Cryoborolls, stony loam, 50 to 75 percent slopes (Cryoborolls, loamy-skeletal, mixed)—5 percent
- Inclusion 3: Rock outcrop—2 percent

### Characteristics of the Troutville Variant

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium; source—granitic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Limber pine, mountain big sagebrush

*Percent of surface covered by rock fragments:* 25 percent pebbles, 5 percent cobbles, 5 percent stones, 7 percent boulders

### Typical Profile

0 to 4 inches—very bouldery sandy loam; 10 to 25 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 20 inches—very gravelly loamy sand, very gravelly sandy loam; 10 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

20 to 45 inches—very gravelly sandy loam; 10 to 15 percent cobbles and stones, 45 to 70 percent pebbles (by weight); massive; slightly hard, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

45 to 60 inches—extremely gravelly coarse sandy loam; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM; estimated AASHTO classification—A-1

## Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 16 inches

*Runoff:* Very rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lower back slopes of mountains

*Slope features:* Length—short; shape—concave

*Contrasting features:* Thick dark-colored surface layer

*Distinctive present vegetation:* Mountain big sagebrush, needlegrass

#### Inclusion 2

*Position on landscape:* Lower back slopes of mountains

*Slope features:* Length—short; shape—slightly concave

*Contrasting features:* Bedrock at a depth of 20 to 40 inches, lower water-supplying capacity

*Distinctive present vegetation:* Curlleaf mountainmahogany

#### Inclusion 3

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

#### Woodland

*Site index for common trees:* Limber pine—40

*Most important native understory plants:* Antelope bitterbrush, mountain big sagebrush, bluegrass, prairie junegrass

#### Ratings of the Troutville Variant for Various Uses

*Wildlife habitat elements:* Coniferous plants

(nonirrigated)—good; wild herbaceous plants

(nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—large stones, erodes easily

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* VIIe, nonirrigated  
*Woodland suitability group:* 1R

## **1730—Bijorja-Petspring association**

### **Map Unit Setting**

*Position on landscape:* Hills and rock pediments  
*Elevation:* 4,800 to 5,500 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Bijorja loamy coarse sand, 8 to 30 percent slopes (Xerollic Camborthids, coarse-loamy, mixed, mesic)—50 percent
  - Petspring very gravelly coarse sandy loam, 30 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—35 percent
- Contrasting inclusions:*
- Inclusion 1: Petspring very gravelly loamy coarse sand, 8 to 30 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—5 percent
  - Inclusion 2: Xeric Torripsamments, gravelly loamy sand (Xeric Torripsamments, mixed, mesic)—5 percent
  - Inclusion 3: Budihol gravelly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—3 percent
  - Inclusion 4: Rock outcrop—2 percent

### **Characteristics of the Bijorja Soil**

*Position on landscape:* Pediments and summits of hills  
*Parent material:* Kind—residuum and colluvium; source—granitic rock  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, desert needlegrass

### **Typical Profile**

0 to 4 inches—loamy coarse sand; 15 to 25 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

4 to 30 inches—gravelly coarse sandy loam; 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 30 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.05; T value—2; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Petspring Soil**

*Position on landscape:* Back slopes of hills and pediments  
*Parent material:* Kind—colluvium and residuum; source—granitic rock  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

### **Typical Profile**

0 to 1 inch—very gravelly coarse sandy loam; 0 to 20 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 3 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Crests of hills adjacent to rock outcrop

*Slope features:* Length—short; shape—convex

*Contrasting features:* Slopes of less than 30 percent

#### Inclusion 2

*Position on landscape:* East-facing foot slopes of hills

*Contrasting features:* Sandy throughout the profile, lower water-supplying capacity, more susceptible to wind erosion

*Distinctive present vegetation:* Fourwing saltbush, Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* North-facing back slopes of hills

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### Inclusion 4

*Position on landscape:* Scattered small peaks and ridges adjacent to crests and shoulder slopes of hills

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

**Other inclusions (in only a few areas):** Uripnes very gravelly coarse sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)

*Position on landscape:* South-facing back slopes of lower hills

*Contrasting features:* Lower water-supplying capacity, slopes of more than 50 percent

*Distinctive present vegetation:* Anderson wolfberry, littleleaf horsebrush, desert needlegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Bijorja Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, too sandy

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Petspring Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Bijorja soil—VIIe, nonirrigated; Petspring soil—VIIs, nonirrigated

*Range site:* Bijorja soil—027X065N; Petspring soil—027X065N

### 1750—Wedlar-Tert association

#### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,800 to 6,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

#### Composition

*Major components:*

- Wedlar stony sandy loam, 4 to 15 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—70 percent

- Tert loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Unsel very gravelly sandy loam, 8 to 30

percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—5 percent

- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 2 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 3: Haploxerollic Durargids, very gravelly sandy loam, 4 to 15 percent slopes (Haploxerollic Durargids, fine-loamy, mixed, mesic)—2 percent

### **Characteristics of the Wedlar Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Kind—mixed alluvium; source—predominantly granitic rock with some welded rhyolitic tuff

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Nevada ephedra, galleta

*Percent of surface covered by rock fragments:* 3 percent stones

### **Typical Profile**

0 to 6 inches—stony sandy loam; 10 to 15 percent cobbles and stones, 25 to 45 percent pebbles (by weight); single grained; loose; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 14 inches—loam; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

14 to 37 inches—sandy clay loam, sandy clay; 0 to 5 percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6, A-7

37 to 60 inches—gravelly sandy loam, gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Tert Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Kind—residuum; source—Tertiary lacustrine sedimentary rocks

*Slope features:* Length—very short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Utah juniper, Mexican cliffrose, galleta

### **Typical Profile**

0 to 3 inches—loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

3 to 60 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 2 to 5 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About ½ inch

*Water-supplying capacity:* About 4 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—1; wind erodibility group—4L

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* To steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Summits of fan piedmont remnants

*Slope features:* Shape—convex

*Contrasting features:* Lower water-supplying capacity, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* More than 35 percent rock fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* Highest summits of fan piedmont remnants

*Contrasting features:* Cemented pan at a depth of 20 to 40 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Wedlar Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Fair—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Tert Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Wedlar soil—Ive, irrigated, and VIs, nonirrigated; Tert soil—VIIIs, nonirrigated

*Range site:* Wedlar soil—029X006N; Tert soil—027X066N

## 1753—Wedlar sand, 2 to 8 percent slopes

### Map Unit Setting

*Position on landscape:* Small concave intraplateau basins

*Elevation:* 6,000 to 7,200 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Wedlar sand, 2 to 8 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Antholop very cobbly sandy loam, 2 to 15 percent slopes (Abruptic Xerollic Durargids, clayey, montmorillonitic, mesic, shallow)—6 percent

- Inclusion 2: Typic Xeropsamments, sand, 8 to 30 percent slopes (Typic Xeropsamments, ashy, frigid)—4 percent

### Characteristics of the Wedlar Soil

*Position on landscape:* Intraplateau basins

*Parent material:* Kind—alluvium; source—predominantly granitic rock with some welded rhyolitic tuff

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, western wheatgrass

### Typical Profile

0 to 5 inches—sand; 0 to 25 percent pebbles (by weight); single grained; loose; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

5 to 11 inches—loam; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

11 to 31 inches—sandy clay loam, sandy clay; 0 to 5

percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6, A-7

31 to 60 inches—gravelly sandy loam, gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of plateaus

*Contrasting features:* Cemented pan within a depth of 14 inches

*Distinctive present vegetation:* Low sagebrush

#### Inclusion 2

*Position on landscape:* North- and east-facing toe slopes of hills and small basins

*Contrasting features:* Sandy throughout the profile, no layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, needleandthread

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Wedlar Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—fair; domestic grasses and legumes

(irrigated)—good; wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair;

wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—shrink-swell, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* IIIe, irrigated, and VI, nonirrigated

*Range site:* 027X045N

## 1780—Borealis-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Volcanic craters and plateaus

*Elevation:* 6,800 to 8,100 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 95 days

### Composition

*Major components:*

- Borealis very stony fine sandy loam, 8 to 30 percent slopes (Abruptic Durixeralfs, fine, mixed, frigid)—50 percent

- Rock outcrop—35 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Xeropsamments, sand, 8 to 50 percent slopes (Typic Xeropsamments, ashy, frigid)—8 percent

- Inclusion 2: Rubble land—5 percent

- Inclusion 3: Lithic Xeric Torriorthents, stony, loamy sand, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, frigid)—2 percent

### Characteristics of the Borealis Soil

*Position on landscape:* Volcanic craters and summits of plateaus

*Parent material:* Kind—residuum; source—basalt

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, antelope bitterbrush

*Percent of surface covered by rock fragments:* 5 percent stones

### Typical Profile

0 to 11 inches—very stony fine sandy loam; 5 to 35 percent cobbles and stones, 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

11 to 23 inches—gravelly clay loam, gravelly clay; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, CL, GC; estimated AASHTO classification—A-7

23 to 40 inches—indurated duripan  
40 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 20 to 35 inches  
*Depth to bedrock:* 35 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 11 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges  
*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North- and east-facing side slopes of plateaus and volcanic craters  
*Slope features:* Shape—concave  
*Contrasting features:* No duripan throughout the profile, lower water-supplying capacity, no layer of clay accumulation  
*Distinctive present vegetation:* Wyoming big sagebrush, needleandthread

#### Inclusion 2

*Position on landscape:* Scattered areas of stones and boulders on side slopes  
*Contrasting features:* More than 90 percent rock fragments on the surface

#### Inclusion 3

*Position on landscape:* Side slopes of volcanic craters  
*Contrasting features:* Hard bedrock within a depth of 14 inches, lower water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Wildlife habitat, woodland

### Woodland

*Site index for common trees on the Borealis soil:*  
Singleleaf pinyon—35; Utah juniper—35  
*Most important native understory plants:* Borealis soil—mountain big sagebrush, antelope bitterbrush, Indian ricegrass

### Ratings of the Borealis Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; coniferous plants (nonirrigated)—good; shrubs (nonirrigated)—good  
*Range seeding:* Fair—droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope  
*Local roads and streets:* Severe—slope, shrink-swell  
*Roadfill:* Poor—depth to bedrock, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Borealis soil—VIIs, nonirrigated;  
Rock outcrop—VIIIs  
*Woodland suitability group:* Borealis soil—1X

## 1781—Borealis-Antholop-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Plateaus  
*Elevation:* 6,500 to 7,500 feet  
*Average annual precipitation:* About 12 inches  
*Average annual air temperature:* About 45 degrees F  
*Frost-free season:* About 100 days

### Composition

*Major components:*  
• Borealis very stony fine sandy loam, 8 to 15 percent

slopes (Abruptic Durixeralfs, fine, mixed, frigid)—65 percent

- Antholop very cobbly sandy loam, 2 to 15 percent slopes (Abruptic Xerollic Durargids, clayey, montmorillonitic, mesic, shallow)—15 percent
- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Xeropsamments, sand, 8 to 50 percent slopes (Typic Xeropsamments, ashy, frigid)—6 percent
- Inclusion 2: Borealis very stony fine sandy loam, 15 to 30 percent slopes (Abruptic Durixeralfs, fine, mixed, frigid)—4 percent

### **Characteristics of the Borealis Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum; source—basalt

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, antelope bitterbrush

*Percent of surface covered by rock fragments:* 15 percent pebbles, 15 percent cobbles, 5 percent stones

### **Typical Profile**

0 to 11 inches—very stony fine sandy loam; 5 to 35 percent cobbles and stones, 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

11 to 23 inches—gravelly clay loam, gravelly clay; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, CL, GC; estimated AASHTO classification—A-7

23 to 40 inches—indurated duripan

40 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 20 to 35 inches

*Depth to bedrock:* 35 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 11 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Antholop Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum; source—basalt

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, green rabbitbrush, galleta, bottlebrush squirreltail, pine bluegrass

### **Typical Profile**

0 to 6 inches—very cobbly sandy loam; 30 to 40 percent cobbles and stones, 20 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 16 inches—clay; 0 to 5 percent cobbles and stones, 0 to 25 percent pebbles (by weight); prismatic to angular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CH, CL; estimated AASHTO classification—A-7

16 to 60 inches—indurated duripan

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Areas of rimrock occurring as

small, steep ridges throughout the map unit  
*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North- and east-facing summits and side slopes of plateaus  
*Slope features:* Shape—concave  
*Contrasting features:* No duripan throughout the profile, no layer of clay accumulation  
*Distinctive present vegetation:* Wyoming big sagebrush, needleandthread

#### **Inclusion 2**

*Position on landscape:* Side slopes of plateaus  
*Contrasting features:* Slopes of more than 15 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

#### **Woodland**

*Site index for common trees on the Borealis soil:*  
 Singleleaf pinyon—35; Utah juniper—35  
*Most important native understory plants:* Borealis soil—mountain big sagebrush, antelope bitterbrush, pine bluegrass

#### **Ratings of the Borealis Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; coniferous plants (nonirrigated)—good; shrubs (nonirrigated)—good  
*Range seeding:* Fair—droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, cemented pan  
*Local roads and streets:* Severe—shrink-swell  
*Roadfill:* Poor—depth to bedrock, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Antholop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, shrink-swell, low strength  
*Roadfill:* Poor—cemented pan, shrink-swell, low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Borealis soil—VIIIs, nonirrigated;

Antholop soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Antholop soil—027X049N

*Woodland suitability group:* Borealis soil—1X

## **1782—Borealis-Mopana association**

### **Map Unit Setting**

*Position on landscape:* Plateaus  
*Elevation:* 6,800 to 7,800 feet  
*Average annual precipitation:* About 13 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Borealis very stony fine sandy loam, 4 to 15 percent slopes (Abruptic Durixeralfs, fine, mixed, frigid)—55 percent
  - Mopana stony fine sandy loam, 2 to 8 percent slopes (Abruptic Aridic Durixerolls, clayey, montmorillonitic, frigid, shallow)—35 percent
- Contrasting inclusions:*
- Inclusion 1: Abruptic Durixeralfs, stony fine sandy loam, 2 to 8 percent slopes (Abruptic Durixeralfs, clayey, montmorillonitic, frigid, shallow)—7 percent
  - Inclusion 2: Rock outcrop—3 percent

### **Characteristics of the Borealis Soil**

*Position on landscape:* Summits of plateaus  
*Parent material:* Kind—residuum; source—basalt  
*Slope features:* Length—long; shape—slightly concave to convex  
*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, antelope bitterbrush  
*Percent of surface covered by rock fragments:* 5 percent stones

### **Typical Profile**

- 0 to 11 inches—very stony fine sandy loam; 5 to 35 percent cobbles and stones, 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 11 to 23 inches—gravelly clay loam, gravelly clay; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, CL, GC; estimated AASHTO classification—A-7

23 to 40 inches—indurated duripan

40 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 20 to 35 inches

*Depth to bedrock:* 35 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 11 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Mopana Soil

*Position on landscape:* Plateaus

*Parent material:* Kind—residuum; source—basalt

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, bottlebrush squirreltail

*Percent of surface covered by rock fragments:* 3 percent stones

### Typical Profile

0 to 4 inches—stony fine sandy loam; 10 to 15 percent cobbles and stones, 25 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

4 to 8 inches—loam; 0 to 10 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

8 to 19 inches—clay, gravelly clay loam; 0 to 10 percent cobbles and stones, 0 to 40 percent pebbles (by weight); platy structure parting to angular blocky; very hard, very firm; neutral (pH 7.0); nonsaline

(less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL, CH, SC; estimated AASHTO classification—A-7

19 to 60 inches—indurated duripan

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Summits of plateaus

*Slope features:* Shape—slightly convex

*Contrasting features:* Cemented pan within a depth of 20 inches, no thick dark surface

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

#### Inclusion 2

*Position on landscape:* Rimrock

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

#### Woodland

*Site index for common trees on the Borealis soil:*

Singleleaf pinyon—35; Utah juniper—35

*Most important native understory plants:* Borealis—mountain big sagebrush, antelope bitterbrush, bottlebrush squirreltail

#### Ratings of the Borealis Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; coniferous plants

(nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Fair—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, cemented pan

*Local roads and streets:* Severe—shrink-swell

*Roadfill:* Poor—depth to bedrock, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Mopana Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—rooting depth  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, shrink-swell, low strength  
*Roadfill:* Poor—cemented pan, shrink-swell, low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Borealis soil—VII<sub>s</sub>, nonirrigated; Mopana soil—VII<sub>s</sub>, nonirrigated  
*Range site:* Mopana soil—026X028N  
*Woodland suitability group:* Borealis soil—1X

### **1783—Borealis-Itca association**

#### **Map Unit Setting**

*Position on landscape:* Plateaus  
*Elevation:* 6,800 to 7,800 feet  
*Average annual precipitation:* About 13 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 90 days

#### **Composition**

##### *Major components:*

- Borealis very stony fine sandy loam, 4 to 15 percent slopes (Abruptic Durixeralfs, fine, mixed, frigid)—65 percent
- Itca extremely stony loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid)—20 percent

##### *Contrasting inclusions:*

- Inclusion 1: Abruptic Aridic Durixerolls, stony sandy loam, 4 to 15 percent slopes (Abruptic Aridic Durixerolls, clayey, montmorillonitic, frigid, shallow)—6 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Argic Durixerolls (clayey-skeletal, montmorillonitic, frigid)—4 percent

#### **Characteristics of the Borealis Soil**

*Position on landscape:* Summits of plateaus  
*Parent material:* Kind—residuum; source—basalt

*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, antelope bitterbrush  
*Percent of surface covered by rock fragments:* 5 percent stones

#### **Typical Profile**

0 to 11 inches—very stony fine sandy loam; 5 to 35 percent cobbles and stones, 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 11 to 23 inches—gravelly clay loam, gravelly clay; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); angular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, CL, GC; estimated AASHTO classification—A-7  
 23 to 40 inches—indurated duripan  
 40 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to hardpan:* 20 to 35 inches  
*Depth to bedrock:* 35 to 40 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 11 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

#### **Characteristics of the Itca Soil**

*Position on landscape:* Side slopes of plateaus  
*Parent material:* Kind—residuum; source—basalt  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, antelope bitterbrush  
*Percent of surface covered by rock fragments:* 30 percent cobbles, 25 percent stones

**Typical Profile**

0 to 2 inches—extremely stony loam; 30 to 50 percent cobbles and stones, 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6

2 to 18 inches—very cobbly clay loam, very gravelly clay, extremely gravelly clay; 0 to 55 percent cobbles and stones, 25 to 70 percent pebbles (by weight); prismatic structure parting to angular blocky; hard, friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-7, A-2

18 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Summits of plateaus

*Slope features:* Length—short; shape—convex

*Contrasting features:* Cemented duripan at a depth of less than 20 inches

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

**Inclusion 2**

*Position on landscape:* Rimrock

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

**Inclusion 3**

*Position on landscape:* Remnants of plateaus at higher elevations

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, antelope bitterbrush, basin wildrye

**Major Uses**

**Current uses:** Wildlife habitat, woodland

**Woodland**

*Site index for common trees on the Borealis soil:*

Singleleaf pinyon—35; Utah juniper—35

*Site index for common trees on the Itca soil:* Singleleaf pinyon—75; Utah juniper—75

*Most important native understory plants:* Mountain big sagebrush, antelope bitterbrush

**Ratings of the Borealis Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; coniferous plants

(nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Fair—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, cemented pan

*Local roads and streets:* Severe—shrink-swell

*Roadfill:* Poor—depth to bedrock, shrink-swell

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Itca Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—thin layer, large stones

**Interpretive Groups**

*Capability classification:* Borealis soil—VIIs, nonirrigated; Itca soil—VIIs, nonirrigated

*Woodland suitability group:* Borealis soil—1X; Itca soil—1R

**1790—Antholop-Wedlar association****Map Unit Setting**

*Position on landscape:* Summits of plateaus

*Elevation:* 6,000 to 7,100 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 105 days

## Composition

### Major components:

- Antholop stony sandy loam, 2 to 15 percent slopes (Abruptic Xerollic Durargids, clayey, montmorillonitic, mesic, shallow)—70 percent
- Wedlar sand, 2 to 8 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—20 percent

### Contrasting inclusions:

- Inclusion 1: Borealis very stony fine sandy loam, 8 to 15 percent slopes (Abruptic Durixeralfs, fine, mixed, frigid)—8 percent
- Inclusion 2: Rock outcrop—2 percent

## Characteristics of the Antholop Soil

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum; source—basalt with additions of eolian material high in volcanic ash

*Slope features:* Length—long; shape—slightly concave to convex

*Dominant present vegetation:* Low sagebrush, green rabbitbrush, galleta, bottlebrush squirreltail, pine bluegrass

*Percent of surface covered by rock fragments:* 3 percent stones

### Typical Profile

0 to 6 inches—stony sandy loam; 5 to 15 percent cobbles and stones, 20 to 45 percent pebbles (by weight); platy structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 16 inches—clay; 0 to 5 percent cobbles and stones, 0 to 25 percent pebbles (by weight); prismatic to angular blocky structure; hard, firm; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CH, CL; estimated AASHTO classification—A-7

16 to 60 inches—indurated duripan

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

## Characteristics of the Wedlar Soil

*Position on landscape:* Intraplateau basins

*Parent material:* Kind—alluvium; source—predominantly granitic rock with some welded rhyolitic tuff

*Slope features:* Length—long; shape—smooth to slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, western wheatgrass

### Typical Profile

0 to 5 inches—sand; 0 to 25 percent pebbles (by weight); single grained; loose; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

5 to 11 inches—loam; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

11 to 31 inches—sandy clay loam, sandy clay; 0 to 5 percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6, A-7

31 to 60 inches—gravelly sandy loam, gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Summits of plateaus adjacent to rimrock

*Contrasting features:* Cemented pan at a depth of more than 20 inches, higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, antelope bitterbrush

#### **Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges throughout the map unit

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Antholop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, rooting depth

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan, low strength, shrink-swell

*Roadfill:* Poor—cemented pan, shrink-swell, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Wedlar Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—droughty, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Antholop soil—VIIs, nonirrigated; Wedlar soil—IIIe, irrigated, and VIi, nonirrigated

*Range site:* Antholop soil—027X049N; Wedlar soil—027X045N

## **1820—Lomoine-Petspring-Uripnes association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 7,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Lomoine very cobbly sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—40 percent
- Petspring very gravelly coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—25 percent
- Uripnes very stony sandy loam, 50 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Budihol extremely bouldery sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—3 percent
- Inclusion 3: Izo extremely gravelly sand, 2 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Rattleflat gravelly sandy loam, 8 to 15 percent slopes (Xerollic Haplargids, coarse-loamy, mixed, mesic)—3 percent

### **Characteristics of the Lomoine Soil**

*Position on landscape:* Higher back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, Indian ricegrass, pine bluegrass

**Typical Profile**

0 to 4 inches—very cobbly sandy loam; 35 to 45 percent cobbles and stones, 40 to 60 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

4 to 8 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

8 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 3 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Petspring Soil**

*Position on landscape:* South-facing back slopes of mountains at higher elevations, north-facing back slopes of mountains at lower elevations

*Parent material:* Kind—colluvium and residuum; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

**Typical Profile**

0 to 1 inch—very gravelly coarse sandy loam; 0 to 20 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 3 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Uripnes Soil**

*Position on landscape:* South-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Nevada ephedra, littleleaf horsebrush, Anderson wolfberry, desert needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones

**Typical Profile**

0 to 3 inches—very stony sandy loam; 20 to 35 percent cobbles and stones, 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 21 inches—weathered bedrock

21 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* Weathered bedrock at 3 to 8 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* North-facing back slopes and shoulder slopes of mountains at higher elevations

*Contrasting features:* Higher water-supplying capacity, boulders on surface

#### **Inclusion 3**

*Position on landscape:* Lower elevation channels

*Contrasting features:* Occasionally flooded, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### **Inclusion 4**

*Position on landscape:* Inset fans and intermountain valley fans at higher elevations

*Contrasting features:* Bedrock at a depth of more than 60 inches, layer of clay accumulation

*Distinctive present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Lomoine Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Ratings of the Petspring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Uripnes Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Lomoine soil—VIIs, nonirrigated; Petspring soil—VIIs, nonirrigated; Uripnes soil—VIIs, nonirrigated

*Range site:* Lomoine soil—029X014N; Petspring soil—027X065N; Uripnes soil—027X047N

## **1821—Lomoine-Kyler-Budihol association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,800 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Lomoine very cobbly sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—55 percent

- Kyler very gravelly fine sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—15 percent

- Budihol extremely bouldery sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Petspring very gravelly sandy loam, 30 to

75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—6 percent

- Inclusion 2: Rock outcrop—4 percent
- Inclusion 3: Rattleflat gravelly sandy loam, 8 to 15 percent slopes (Xerollic Haplargids, coarse-loamy, mixed, mesic)—3 percent

- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 8 to 30 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Lomoiné Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, Indian ricegrass, pine bluegrass

### **Typical Profile**

0 to 4 inches—very cobbly sandy loam; 35 to 45 percent cobbles and stones, 40 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

4 to 8 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

8 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Kyler Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, Indian ricegrass, bottlebrush squirreltail, galleta

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

7 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Budihol Soil**

*Position on landscape:* Upper parts of back slopes of mountains adjacent to rock outcrop

*Parent material:* Kind—residuum and colluvium;  
source—granitic rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, pine bluegrass

*Percent of surface covered by rock fragments:* 10 percent stones, 15 percent boulders

**Typical Profile**

0 to 3 inches—extremely bouldery sandy loam; 20 to 50 percent cobbles and stones, 15 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 7 inches—gravelly coarse sandy loam, gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

7 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* South-facing granitic back slopes of mountains

*Slope features:* Length—long; shape—slightly convex

*Contrasting features:* Warmer soil temperature

*Distinctive present vegetation:* Wyoming big sagebrush, desert needlegrass

**Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

**Inclusion 3**

*Position on landscape:* Intermountain valley fans and toe slopes of mountains

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* Bedrock at a depth of more than 60 inches, slopes of less than 15 percent

**Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Lomoine Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, large stones

**Ratings of the Kyler Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Budihol Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Lomoine soil—VIIs, nonirrigated; Kyler soil—VIIs, nonirrigated; Budihol soil—VIIs, nonirrigated

*Range site:* Lomoin soil—029X014N; Kyler soil—029X014N; Budihol soil—027X007N

## 1822—Lomoin-Kyler-Petspring association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### Composition

*Major components:*

- Lomoin very cobbly sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—35 percent
- Kyler very gravelly fine sandy loam, dry, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—35 percent
- Petspring very gravelly coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Budihol, extremely bouldery sandy loam, 30 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—5 percent
- Inclusion 2: Kyler very gravelly sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent
- Inclusion 3: Rock outcrop—3 percent
- Inclusion 4: Xeric Torriorthents, 15 to 50 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Lomoin Soil

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, Indian ricegrass, pine bluegrass

### Typical Profile

0 to 2 inches—very cobbly sandy loam; 35 to 45 percent cobbles and stones, 40 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

2 to 6 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

6 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Kyler Soil

*Position on landscape:* Steeper, more eroded side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, Bailey greasewood, desert needlegrass

### Typical Profile

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

7 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Petspring Soil**

*Position on landscape:* South- and west-facing back slopes of mountains  
*Parent material:* Kind—colluvium and residuum; source—granitic rock  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

**Typical Profile**

0 to 1 inch—very gravelly coarse sandy loam; 0 to 20 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 3 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 3 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* North- and east-facing crests of mountains  
*Contrasting features:* Higher water-supplying capacity, more boulders on surface  
*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

**Inclusion 2**

*Position on landscape:* Side slopes of mountains on limestone  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Black sagebrush, Sandberg bluegrass, galleta

**Inclusion 3**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

**Inclusion 4**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Lomoine Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

**Ratings of the Kyler Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Petspring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Lomoine soil—VII<sub>s</sub>, nonirrigated; Kyler soil—VII<sub>s</sub>, nonirrigated; Petspring soil—VII<sub>s</sub>, nonirrigated

*Range site:* Lomoine soil—029X014N; Kyler soil—027X061N; Petspring soil—27X065N

### **1825—Lomoine-Beelem-Rock outcrop association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

#### **Composition**

*Major components:*

- Lomoine very gravelly sandy loam, dry, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—35 percent
- Beelem very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—35 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Stewval very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—8 percent

- Inclusion 2: Old Camp very gravelly loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Xeric Torriorthents, extremely gravelly loamy sand, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—3 percent

#### **Characteristics of the Lomoine Soil**

*Position on landscape:* Eroded back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuff

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, desert needlegrass

#### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

4 to 8 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

8 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 3 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### **Characteristics of the Beelem Soil**

*Position on landscape:* Eroded back slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—welded tuff and altered granitic rock  
*Slope features:* Length—long; shape—concave to  
convex

*Dominant present vegetation:* Singleleaf pinyon, Utah  
juniper, black sagebrush

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent  
cobbles and stones, 50 to 70 percent pebbles (by  
weight); subangular blocky structure; soft, very  
friable; moderately alkaline (pH 8.0); nonsaline (less  
than 2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—SM; estimated  
AASHTO classification—A-1, A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent  
cobbles and stones, 25 to 45 percent pebbles (by  
weight); subangular blocky structure; soft, very  
friable; moderately alkaline (pH 8.0); nonsaline (less  
than 2 mmhos/cm); nonsodic (SAR less than 2);  
estimated Unified classification—SM; estimated  
AASHTO classification—A-2

3 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—  
1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and  
ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulder slopes, crests, and  
summits of mountains

*Contrasting features:* Layer of clay accumulation, slopes  
of less than 30 percent

*Distinctive present vegetation:* Black sagebrush,  
Sandberg bluegrass, galleta

#### Inclusion 2

*Position on landscape:* North-facing shoulder slopes of  
mountains at higher elevations

*Contrasting features:* Layer of clay accumulation, higher  
water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush,  
Sandberg bluegrass

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than  
20 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush,  
rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

#### Woodland

*Site index for common trees on the Beelem soil:*

Singleleaf pinyon—30; Utah juniper—30

*Most important native understory plants:* Beelem soil—  
black sagebrush, Indian ricegrass

#### Ratings of the Lomoine Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope, depth to  
bedrock

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Beelem Soil for Various Uses

*Wildlife habitat elements:* Coniferous plants

(nonirrigated)—poor; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to  
bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock,  
slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Lomoine soil—VIIIs,

nonirrigated; Beelem soil—VIIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Lomoin soil—027X061N

*Woodland suitability group:* Beelem soil—1R

## 1840—Kyler-Gabbvally association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 5,800 to 7,300 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

### Composition

*Major components:*

- Kyler very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—50 percent
- Gabbvally very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Crunker very gravelly loamy sand, 8 to 15 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—8 percent
- Inclusion 2: Eaglepass very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent
- Inclusion 3: Xeric Torriorthents, very gravelly sand, 8 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Kyler Soil

*Position on landscape:* Crests, shoulder slopes, and back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass

### Typical Profile

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

7 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Gabbvally Soil

*Position on landscape:* Crests, shoulder slopes, and back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; shaly, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Remnants of inset fans

*Contrasting features:* Rarely flooded, depth to bedrock more than 60 inches

**Inclusion 2**

*Position on landscape:* Back slopes of limestone mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Littleleaf mountainmahogany

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Slopes of less than 15 percent, depth to bedrock more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Kyler Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Kyler soil—VIIs, nonirrigated;

Gabbvally soil—VIIs, nonirrigated

*Range site:* Kyler soil—029X014N; Gabbvally soil—029X010N

**1842—Kyler-Rock outcrop association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

**Composition**

*Major components:*

- Kyler very gravelly fine sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—65 percent
- Rock outcrop—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly sandy loam, 4 to 15 percent slopes (Xeric Torriorthents, loamy-skeletal, massive [calcareous], mesic)—8 percent
- Inclusion 2: Kyler very gravelly fine sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Kyler Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass, bottlebrush squirreltail

### Typical Profile

- 0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2
- 3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4
- 7 inches—unweathered bedrock

### Soil and Water Features

- Depth to bedrock:* 6 to 14 inches
- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* None
- Permeability:* Moderate
- Available water capacity:* About 1 inch
- Water-supplying capacity:* About 7 inches
- Runoff:* Rapid
- Hydrologic group:* D
- Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5
- Hazard of erosion:* By water—moderate; by wind—slight
- Shrink-swell potential:* Low
- Corrosivity:* Steel—high; concrete—low
- Potential for frost action:* Moderate

### Characteristics of the Rock Outcrop

- Position on landscape:* Scattered small peaks and ridges
- Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

- Position on landscape:* Toe slopes of mountains
- Contrasting features:* Depth to bedrock more than 60 inches, slopes of less than 15 percent

#### Inclusion 2

- Position on landscape:* Back slopes of mountains
- Contrasting features:* Slopes of more than 50 percent

#### Inclusion 3

- Position on landscape:* Channels
- Contrasting features:* Depth to bedrock more than 60 inches, occasionally flooded
- Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Kyler Soil for Various Uses

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
- Range seeding:* Poor—droughty, small stones, depth to bedrock
- Shallow excavations:* Severe—depth to bedrock, slope
- Local roads and streets:* Severe—depth to bedrock, slope
- Roadfill:* Poor—depth to bedrock, slope
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

- Capability classification:* Kyler soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs
- Range site:* Kyler soil—029X014N

## 1843—Kyler-Logring-Rock outcrop association

### Map Unit Setting

- Position on landscape:* Mountains
- Elevation:* 6,300 to 7,600 feet
- Average annual precipitation:* About 10 inches
- Average annual air temperature:* About 51 degrees F
- Frost-free season:* About 115 days

### Composition

#### Major components:

- Kyler very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—40 percent
- Logring very gravelly sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—25 percent
- Rock outcrop—25 percent

#### Contrasting inclusions:

- Inclusion 1: Logring very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—3 percent
- Inclusion 2: Xeric Torriorthents, very gravelly sandy loam, 4 to 15 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
- Inclusion 3: Stewval very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Wrango very gravelly sandy loam, 4 to 15

percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Kyler Soil**

*Position on landscape:* Shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

7 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Logring Soil**

*Position on landscape:* Back slopes of north-facing mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Utah juniper, black sagebrush, pine bluegrass, eriogonum, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 13 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

13 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Steeper north-facing back slopes of mountains

*Contrasting features:* Slopes of more than 50 percent

#### **Inclusion 2**

*Position on landscape:* Toe slopes of mountains

*Contrasting features:* Slopes of less than 15 percent, depth to bedrock more than 60 inches

### **Inclusion 3**

*Position on landscape:* Shoulder slopes and back slopes of volcanic rock mountains

*Contrasting features:* Less calcium carbonate throughout the profile, layer of clay accumulation

### **Inclusion 4**

*Position on landscape:* Inset fans

*Contrasting features:* Rarely flooded, slopes of less than 15 percent, depth to bedrock more than 60 inches

## **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

### **Woodland**

*Site index for common trees on the Logring soil:* Utah juniper—38

*Most important native understory plants:* Logring soil—black sagebrush, green ephedra, bottlebrush squirreltail, pine bluegrass

### **Ratings of the Kyler Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Logring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

## **Interpretive Groups**

*Capability classification:* Kyler soil—VIIs, nonirrigated; Logring soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Kyler soil—029X014N

*Woodland suitability group:* Logring soil—1R

## **1844—Kyler very gravelly fine sandy loam, 15 to 50 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,300 to 7,700 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Kyler very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Theriot very gravelly sandy loam, 15 to 30 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent

- Inclusion 3: Logring very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—3 percent

- Inclusion 4: Wrango very gravelly sandy loam, 4 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Kyler Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass, bottlebrush squirreltail

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC;

estimated AASHTO classification—A-2, A-4  
7 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulder slopes and back slopes of volcanic rock mountains  
*Contrasting features:* Less calcium carbonate throughout the profile, layer of clay accumulation

#### Inclusion 2

*Position on landscape:* Lower parts of south-facing mountain back slopes  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Spiny menodora, desert needlegrass, galleta

#### Inclusion 3

*Position on landscape:* More eroded crests and back slopes of mountains  
*Contrasting features:* Layer of lime accumulation at a depth of 7 to 14 inches  
*Distinctive present vegetation:* Utah juniper, black sagebrush

#### Inclusion 4

*Position on landscape:* Toe slopes of mountains and inset fans  
*Contrasting features:* Depth to bedrock more than 60 inches  
*Distinctive present vegetation:* Black sagebrush, spiny hopsage, Indian ricegrass

**Other inclusions (in only a few areas):** Rock outcrop  
*Position on landscape:* Scattered small peaks and ridges  
*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Kyler Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated  
*Range site:* 029X014N

## 1860—Venable Family, 0 to 8 percent slopes

### Map Unit Setting

*Position on landscape:* Intermountain basins  
*Elevation:* 7,800 to 9,200 feet  
*Average annual precipitation:* About 16 inches  
*Average annual air temperature:* About 42 degrees F  
*Frost-free season:* About 70 days

### Composition

*Major components:*

- Venable Family, loam, 0 to 8 percent slopes (Cumulic Cryaquolls, fine-loamy, mixed)—90 percent
- Contrasting inclusions:*
- Inclusion 1: Typic Argixerolls, 8 to 15 percent slopes—5 percent
  - Inclusion 2: Aquic Cryorthents, 0 to 8 percent slopes—5 percent

### Characteristics of the Venable Family

*Position on landscape:* Intermountain basins at higher elevations  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Lupine, sedge, mountain brome

### Typical Profile

0 to 15 inches—loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6  
15 to 60 inches—loam, silt loam, clay loam; 0 to 10

percent pebbles (by weight); massive; slightly hard, very friable; slightly acid (pH 6.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML, CL; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* 12 to 24 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately slow  
*Available water capacity:* About 10 inches  
*Water-supplying capacity:* About 18 inches  
*Runoff:* Very slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Toe slopes of mountains, near seeps  
*Contrasting features:* Slopes of more than 8 percent  
*Distinctive present vegetation:* Aspen, willow

#### Inclusion 2

*Position on landscape:* Intermountain basin meadows that have been drained  
*Contrasting features:* Lighter colored surface horizon  
*Distinctive present vegetation:* Silver sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Venable Family for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—poor  
*Range seeding:* Good  
*Shallow excavations:* Severe—wetness  
*Local roads and streets:* Severe—frost action  
*Roadfill:* Fair—shrink-swell, low strength, wetness  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—piping, wetness

### Interpretive Groups

*Capability classification:* Vw, nonirrigated  
*Range site:* 027X004N

## 1870—Luning-Sundown association

### Map Unit Setting

*Position on landscape:* Fan skirts  
*Elevation:* 4,300 to 5,000 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 140 days

### Composition

#### Major components:

- Luning loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—75 percent
- Sundown loamy fine sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—15 percent

#### Contrasting inclusions:

- Inclusion 1: Izo loamy sand, overblown, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 2: Gynelle gravelly sandy loam, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Typic Torriorthents, gravelly sand, 0 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—2 percent
- Inclusion 4: Cirac fine sand, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—2 percent

### Characteristics of the Luning Soil

*Position on landscape:* Fan skirts and sand sheets  
*Parent material:* Eolian material and mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Fourwing saltbush, Cooper wolfberry, Nevada dalea, littleleaf horsebrush, Indian ricegrass

### Typical Profile

0 to 4 inches—sandy loam; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 4 to 60 inches—stratified sandy loam to very gravelly coarse sand; 0 to 10 percent cobbles and stones, 10 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Sundown Soil**

*Position on landscape:* Sand sheets over fan skirts  
*Parent material:* Kind—alluvium and eolian material; source—various kinds of rock  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, Russian-thistle, fourwing saltbush

**Typical Profile**

0 to 3 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); platy structure; soft, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 3 to 60 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Rapid  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Channels with thin sand sheets  
*Contrasting features:* More than 35 percent rock fragments between depths of 10 and 60 inches

**Inclusion 2**

*Position on landscape:* Upper parts of fan skirts  
*Contrasting features:* More than 35 percent rock fragments throughout the profile  
*Distinctive present vegetation:* Cooper wolfberry, shadscale, Bailey greasewood

**Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Bailey greasewood, Cooper wolfberry

**Inclusion 4**

*Position on landscape:* Lower parts of fan skirts  
*Contrasting features:* Loamy textures throughout the profile, SAR more than 13 below a depth of 10 inches  
*Distinctive present vegetation:* Shadscale, Cooper wolfberry

**Major Uses**

**Current uses:** Wildlife habitat, rangeland  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

**Ratings of the Luning Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—piping, seepage

**Ratings of the Sundown Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, soil blowing

*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Moderate—piping, seepage

### **Interpretive Groups**

*Capability classification:* Luning soil—VIIs, nonirrigated; Sundown soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Luning soil—027X060N; Sundown soil—027X060N

## **1871—Luning sandy loam, 0 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Alluvial fans and fan skirts  
*Elevation:* 4,000 to 4,600 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 145 days

### **Composition**

*Major components:*

- Luning sandy loam, 0 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, sandy loam, 0 to 2 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—8 percent
- Inclusion 2: Gynelle gravelly sandy loam, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Luning Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Kind—mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry, Indian ricegrass

### **Typical Profile**

0 to 4 inches—sandy loam; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 4 to 60 inches—stratified sandy loam to very gravelly

coarse sand; 0 to 10 percent cobbles and stones, 10 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower fan skirts  
*Contrasting features:* More than 10 percent clay throughout the profile

#### **Inclusion 2**

*Position on landscape:* Alluvial fans  
*Contrasting features:* More than 35 percent rock fragments throughout the profile

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Luning Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—piping, seepage

### **Interpretive Groups**

*Capability classification:* VIIc, nonirrigated  
*Range site:* 027X043N

**1875—Luning-Hawsley-Bluewing association****Map Unit Setting**

*Position on landscape:* Alluvial fans

*Elevation:* 4,100 to 5,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Luning loamy sand, gravelly substratum, 2 to 8 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—45 percent
- Hawsley loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—30 percent
- Bluewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent
- Inclusion 2: Bluewing loamy sand, overblown, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

**Characteristics of the Luning Soil**

*Position on landscape:* Fan remnants and fanettes with sand sheets

*Parent material:* Mixed alluvium with a cap of sandy eolian material

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Indian ricegrass, Bailey greasewood, Cooper wolfberry

**Typical Profile**

0 to 6 inches—loamy sand; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 35 inches—loamy fine sand, fine sand; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

35 to 60 inches—stratified very gravelly sand to gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 55 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH

8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, SP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Hawsley Soil**

*Position on landscape:* Sand sheets

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood, Nevada dalea

**Typical Profile**

0 to 8 inches—loamy sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Bluewing Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Bailey greasewood, burrobrush

### **Typical Profile**

0 to 9 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones, 55 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1  
 9 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief; months—November to September  
*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Semistabilized sand dunes  
*Slope features:* Length—very short; shape—convex to concave  
*Contrasting features:* Less stable surface, fine sand texture throughout the profile  
*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass, fourwing saltbush

#### **Inclusion 2**

*Position on landscape:* Channels with sand sheets  
*Slope features:* Shape—slightly concave  
*Contrasting features:* More than 35 percent pebbles between depths of 10 and 60 inches, rarely flooded  
*Distinctive present vegetation:* Indian ricegrass, Bailey greasewood

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Luning Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Seepage, piping

### **Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage, piping

**Ratings of the Bluewing Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too sandy, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Luning soil—IVs, irrigated, and VIIs, nonirrigated; Hawsley soil—IVs, irrigated, and VIIs, nonirrigated; Bluewing soil—VIIw, nonirrigated  
*Range site:* Luning soil—027X060N; Hawsley soil—027X009N; Bluewing soil—027X022N

**1877—Luning-Izo association****Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,600 to 5,300 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 140 days

**Composition**

*Major components:*

- Luning loamy sand, gravelly substratum, 2 to 8 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—75 percent
  - Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Hawsley loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—7 percent
  - Inclusion 2: Gynelle gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

**Characteristics of the Luning Soil**

*Position on landscape:* Fan piedmonts with sand sheets  
*Parent material:* Mixed alluvium with a cap of sandy eolian material  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Indian ricegrass, littleleaf, horsebrush, Nevada dalea, Bailey greasewood, fourwing saltbush

**Typical Profile**

0 to 6 inches—loamy sand; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 6 to 35 inches—loamy fine sand, fine sand; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 35 to 60 inches—stratified very gravelly sand to gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 55 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, SP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Izo Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Burrobrush, rabbitbrush, shadscale, fourwing saltbush, Bailey greasewood

**Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sand sheets  
*Slope features:* Length—short; shape—smooth  
*Contrasting features:* Less than 35 percent rock fragments throughout the profile

#### Inclusion 2

*Position on landscape:* Fan skirts and fan aprons  
*Slope features:* Shape—slightly convex  
*Contrasting features:* Rarely flooded, more than 35 percent rock fragments between depths of 10 and 40 inches

#### Other inclusions (in only a few areas)

- Haplic Durorthids, 0 to 4 percent slopes

*Position on landscape:* Nonburied fan remnants

- Typic Calciorthids, 0 to 4 percent slopes

*Position on landscape:* Fan remnants with sand sheets

### Major Uses

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Luning Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—piping, seepage

### Ratings of the Izo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Luning soil—IVs, irrigated, and VIIs, nonirrigated; Izo soil—VIIw, nonirrigated  
*Range site:* Luning soil—027X060N; Izo soil—029X041N

## 1878—Luning-Oricto association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,000 to 5,000 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 140 days

### Composition

#### Major components:

- Luning loamy sand, gravelly substratum, 2 to 8 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—70 percent
- Oricto gravelly loamy sand, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—15 percent

#### Contrasting inclusions:

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 2: Gynelle gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Typic Torriorthents, sandy or sandy-skeletal—4 percent
- Inclusion 4: Sundown loamy sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent

### **Characteristics of the Luning Soil**

*Position on landscape:* Inset fans with sand sheets

*Parent material:* Mixed alluvium with a cap of sandy eolian material

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Bailey greasewood, Indian ricegrass, littleleaf horsebrush

### **Typical Profile**

0 to 6 inches—loamy sand; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 35 inches—loamy fine sand, fine sand; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

35 to 60 inches—stratified very gravelly sand to gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 55 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, SP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Oricto Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Cooper wolfberry

### **Typical Profile**

0 to 3 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2

8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, more than 35 percent rock fragments throughout the profile, no layer of clay accumulation

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Higher fan aprons

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* More than 35 percent rock fragments throughout the profile, no layer of clay accumulation

#### **Inclusion 3**

*Position on landscape:* Lower beaches adjacent to Walker Lake

*Contrasting features:* Variable sandy textures, 0 to 90 percent rock fragments throughout the profile

#### **Inclusion 4**

*Position on landscape:* Sand sheets

*Slope features:* Length—short; shape—smooth

*Contrasting features:* No layer of clay accumulation, less than 35 percent rock fragments throughout the profile

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Luning Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—piping, seepage

#### **Ratings of the Oricto Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, excess salt, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

### **Interpretive Groups**

*Capability classification:* Luning soil—IV, irrigated, and VIIs, nonirrigated; Oricto soil—VIIs, nonirrigated

*Range site:* Luning soil—027X060N; Oricto soil—029X032N

## **1879—Luning-Eastgate association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,000 to 5,200 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Luning gravelly loamy sand, gravelly substratum, 0 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—50 percent

- Eastgate gravelly loamy sand, 0 to 4 percent slopes (Typic Camborthids, sandy, mixed, mesic)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Oricto gravelly loamy sand, 0 to 2 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—8 percent

- Inclusion 2: Isolde fine sand, warm, 4 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent

### **Characteristics of the Luning Soil**

*Position on landscape:* Inset fans with sand sheets

*Parent material:* Mixed alluvium with a cap of sandy eolian material

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Bailey greasewood, Indian ricegrass, Cooper wolfberry

**Typical Profile**

- 0 to 6 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 6 to 35 inches—loamy fine sand, fine sand; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 35 to 60 inches—stratified very gravelly sand to gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 55 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, SP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Eastgate Soil**

*Position on landscape:* Summits of fan piedmont remnants with sand sheets  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Bailey greasewood, Indian ricegrass, Cooper wolfberry

**Typical Profile**

- 0 to 5 inches—gravelly loamy sand; 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4);

estimated Unified classification—SM; estimated AASHTO classification—A-1

- 5 to 17 inches—gravelly sandy loam, sandy loam; 10 to 30 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 17 to 25 inches—gravelly loamy sand, loamy sand; 10 to 30 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 25 to 60 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Higher summits of fan piedmont remnants  
*Slope features:* Length—short; shape—slightly convex  
*Contrasting features:* Layer of clay accumulation  
*Distinctive present vegetation:* Cooper wolfberry, shadscale, Bailey greasewood

**Inclusion 2**

*Position on landscape:* Semistabilized sand dunes  
*Slope features:* Length—very short; shape—convex to concave  
*Contrasting features:* Less than 15 percent rock

fragments throughout the profile, slopes of more than 4 percent

*Distinctive present vegetation:* Hairy horsebrush, fourwing saltbush, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Luning Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—piping, seepage

### **Ratings of the Eastgate Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Luning soil—IVs, irrigated, and VIIs, nonirrigated; Eastgate soil—VIIs, nonirrigated

*Range site:* Luning soil—027X060N; Eastgate soil—027X060N

## **1890—Wardenot, moderately steep-Wardenot-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Wardenot very gravelly sandy loam, moist, 15 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—55 percent
- Wardenot very gravelly sandy loam, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent
- Izo very gravelly sand, rarely flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

#### *Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Candelaria very gravelly sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Rock outcrop—2 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Moderately Steep Wardenot Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

### **Typical Profile**

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Less Sloping Wardenot Soil**

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

#### **Typical Profile**

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1  
 5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

#### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM, SM, SP-SM; estimated AASHTO classification—A-1  
 8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Higher fan piedmont remnants  
*Contrasting features:* Horizon of calcium carbonate accumulation

**Inclusion 3**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

**Inclusion 4**

*Position on landscape:* Channels at higher elevations

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Other inclusions (in only a few areas):** Badland

*Position on landscape:* Convex side slopes of fan piedmont remnants with exposed Tertiary lacustrine sediments

*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Moderately Steep Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—large stones, slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, large stones

**Ratings of the Less Sloping Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Too arid, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, large stones

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Moderately steep Wardenot soil—VIIIs, nonirrigated; Wardenot soil—VIIIs, nonirrigated; Izo soil—VIIIs, nonirrigated

*Range site:* Moderately steep Wardenot soil—029X036N; Wardenot soil—029X036N; Izo soil—029X036N

**1891—Wardenot-Izo association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Wardenot very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—70 percent

- Izo extremely gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Candelaria very gravelly sandy loam, dry, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Pintwater very gravelly sandy loam, 4 to 15 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent

- Inclusion 3: Annaw very gravelly sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Wardenot Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta

**Typical Profile**

0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/

cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Bailey greasewood, galleta, rabbitbrush, burrobrush

### Typical Profile

0 to 8 inches—extremely gravelly loamy sand; 0 to 15 percent cobbles and stones, 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1  
 8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Higher fan piedmont remnants  
*Contrasting features:* Horizon of calcium carbonate accumulation

#### Inclusion 2

*Position on landscape:* Hills  
*Contrasting features:* Bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### Inclusion 3

*Position on landscape:* Higher summits of fan piedmont remnants  
*Contrasting features:* Sandy loam layer at a depth of 8 to 16 inches  
*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Wardenot Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### Ratings of the Izo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Wardenot soil—VII<sub>s</sub>, nonirrigated; Izo soil—VII<sub>w</sub>, nonirrigated  
*Range site:* Wardenot soil—029X017N; Izo soil—029X041N

## 1892—Wardenot, moist-Izo association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,000 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

#### Major components:

- Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—70 percent
- Izo extremely gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

#### Contrasting inclusions:

- Inclusion 1: Izo very gravelly loamy sand, rarely flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent
- Inclusion 2: Annaw very gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—5 percent

### Characteristics of the Moist Wardenot Soil

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

### Typical Profile

0 to 4 inches—very gravelly loamy sand; 0 to 10

percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

4 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Bailey greasewood, spiny menodora, galleta, rabbitbrush

### Typical Profile

0 to 8 inches—extremely gravelly loamy sand; 0 to 15 percent cobbles and stones, 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1  
 8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—GP, GP-GM;  
estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Summits of inset fan remnants  
*Contrasting features:* Rarely flooded

#### Inclusion 2

*Position on landscape:* Higher summits of fan piedmont remnants  
*Contrasting features:* Sandy loam layer at a depth of 8 to 16 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Moist Wardenot Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### Ratings of the Izo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good

*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Moist Wardenot soil—VII<sub>s</sub>, nonirrigated; Izo soil—VII<sub>w</sub>, nonirrigated  
*Range site:* Moist Wardenot soil—029X036N; Izo soil—029X041N

## 1893—Wardenot-Annaw-Izo association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,000 to 6,200 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—45 percent
- Annaw very gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—25 percent
- Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Candelaria very gravelly sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—8 percent
- Inclusion 2: Wardenot very gravelly sandy loam, moist, 8 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Izo very stony sand, rarely flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Wardenot Soil

*Position on landscape:* Remnants of inset fans and fan aprons  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta

### Typical Profile

0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent

pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Annaw Soil

*Position on landscape:* Higher summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta

### Typical Profile

0 to 2 inches—very gravelly loamy sand; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH

8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, burrobrush, rabbitbrush

### Typical Profile

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Highest summits of fan piedmont remnants  
*Contrasting features:* Horizon of calcium carbonate accumulation within a depth of 10 inches

**Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants  
*Contrasting features:* Slopes of more than 8 percent

**Inclusion 3**

*Position on landscape:* Lowest remnants of inset fans  
*Contrasting features:* Rarely flooded, more than 3 percent stones on the surface

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, large stones

**Ratings of the Annaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Wardenot soil—VII<sub>s</sub>, nonirrigated; Annaw soil—VII<sub>s</sub>, nonirrigated; Izo soil—VII<sub>w</sub>, nonirrigated  
*Range site:* Wardenot soil—029X036N; Annaw soil—029X036N; Izo soil—029X041N

**1894—Wardenot-Truhoy-Izo association****Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,400 to 6,200 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

**Composition***Major components:*

- Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—40 percent
- Truhoy very gravelly fine sandy loam, 2 to 8 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—35 percent
- Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Wardenot very stony loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Entic Durorthids, very gravelly fine sandy loam, 2 to 8 percent slopes (Entic Durorthids, loamy, mixed, mesic)—5 percent

- Inclusion 3: Truhoy very gravelly fine sandy loam, 8 to 30 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—4 percent
- Inclusion 4: Pintwater stony sandy loam, 4 to 30 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—1 percent

### **Characteristics of the Wardenot Soil**

*Position on landscape:* Fan aprons and remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

### **Typical Profile**

- 0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1
- 5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Truhoy Soil**

*Position on landscape:* Nonburied fan piedmont remnants and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

### **Typical Profile**

- 0 to 2 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 2 to 11 inches—gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4
- 11 to 17 inches—strongly cemented duripan
- 17 to 60 inches—stratified very gravelly loamy sand to extremely gravelly coarse sand; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 9.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderate; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, burrobrush, rabbitbrush

**Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Fan aprons

*Contrasting features:* More than 3 percent stones on the surface

**Inclusion 2**

*Position on landscape:* Fan aprons and inset fans

*Contrasting features:* Cemented pan at a depth of 20 to 40 inches

**Inclusion 3**

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

**Inclusion 4**

*Position on landscape:* Hills

*Contrasting features:* Bedrock within a depth of 14 inches

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, large stones

**Ratings of the Truhoy Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave, cemented pan

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Wardenot soil—VIIs,

nonirrigated; Truhoy soil—VIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Wardenot soil—029X036N; Truhoy soil—029X036N; Izo soil—029X041N

**1897—Wardenot-Stumble-Izo association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—50 percent
- Stumble loamy fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—30 percent
- Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

#### *Contrasting inclusions:*

- Inclusion 1: Wardenot very gravelly loamy sand, moist, 8 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 2: Isolde fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent
- Inclusion 3: Typic Torriorthents, gravelly sandy loam, 30 to 50 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Wardenot Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

### **Typical Profile**

- 0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1
- 5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Stumble Soil**

*Position on landscape:* Sand sheets over upper fan piedmont remnants and inset fans

*Parent material:* Kind—eolian material and alluvium; source—various kinds of rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Littleleaf horsebrush, fourwing saltbush, Indian ricegrass, dalea

### **Typical Profile**

- 0 to 12 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 12 to 18 inches—loamy fine sand, loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 18 to 60 inches—gravelly loamy sand, gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 30 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Bailey greasewood, galleta, rubber rabbitbrush

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Depth to seasonal high water table:* More than 60 inches  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

#### **Inclusion 2**

*Position on landscape:* Dunes on toe slopes of fan piedmont remnants

*Contrasting features:* Dominantly fine sand throughout the profile, more erosive

*Distinctive present vegetation:* Hairy horsebrush

#### **Inclusion 3**

*Position on landscape:* Steeper side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 30 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Ratings of the Stumble Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Wardenot soil—VIIIs, nonirrigated; Stumble soil—VIIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Wardenot soil—029X036N; Stumble soil—029X009N; Izo soil—029X009N

## 1910—Izo, rarely flooded-Izo association

### Map Unit Setting

*Position on landscape:* Alluvial fans

*Elevation:* 4,400 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Izo very gravelly sand, rarely flooded, 2 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—55 percent

- Izo very stony loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very stony sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Gynelle very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

- Inclusion 3: Candelaria very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—2 percent

- Inclusion 4: Annaw gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—1 percent

### Characteristics of the Rarely Flooded Izo Soil

*Position on landscape:* Alluvial fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, galleta, Indian ricegrass

### Typical Profile

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM, SM, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy coarse sand to

extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Occasionally Flooded Izo Soil

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Rubber rabbitbrush, burrobrush, Nevada ephedra, Indian ricegrass

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 8 inches—very stony loamy sand; 20 to 40 percent cobbles and stones, 65 to 75 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial fans

*Contrasting features:* 3 to 15 percent stones on the surface, rarely flooded

#### **Inclusion 2**

*Position on landscape:* Lower parts of alluvial fans

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Cooper wolfberry, shadscale

#### **Inclusion 3**

*Position on landscape:* Highest alluvial fan remnants

*Contrasting features:* Layer of lime accumulation at a depth of 6 to 14 inches

#### **Inclusion 4**

*Position on landscape:* Alluvial fan remnants

*Contrasting features:* Sandy loam layer at a depth of 8 to 16 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Rarely Flooded Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Occasionally Flooded Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Rarely flooded Izo soil—VIIs, nonirrigated; occasionally flooded Izo soil—VIIw, nonirrigated

*Range site:* Rarely flooded Izo soil—029X036N; occasionally flooded Izo soil—029X041N

### **1930—Cirac fine sandy loam, 0 to 2 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Fan skirts and margins of alluvial flats

*Elevation:* 4,400 to 5,800 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

#### **Composition**

*Major components:*

- Cirac fine sandy loam, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Gynelle very gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Slaw very fine sandy loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—4 percent

#### **Characteristics of the Cirac Soil**

*Position on landscape:* Lower parts of fan skirts adjacent to margins of playas and alluvial flats

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Shadscale, Indian

ricegrass, black greasewood, Cooper wolfberry

#### **Typical Profile**

0 to 5 inches—fine sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable;

very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

5 to 60 inches—stratified gravelly sand to silt loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—February to September

*Permeability:* Moderately rapid

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Upper parts of fan skirts

*Contrasting features:* More than 35 percent pebbles throughout the profile, sandy textures throughout the profile

*Distinctive present vegetation:* Cooper wolfberry, Bailey greasewood, shadscale

#### Inclusion 2

*Position on landscape:* Alluvial flats

*Contrasting features:* More than 18 percent clay throughout the profile

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Cirac Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—

very poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* IIIw, irrigated, and VIIw, nonirrigated

*Range site:* 027X036N

## 1931—Cirac fine sandy loam, ponded, 0 to 2 percent slopes

### Map Unit Setting

*Position on landscape:* Inset fans

*Elevation:* 4,400 to 5,600 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Cirac fine sandy loam, ponded, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, warm, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent
- Inclusion 2: Slaw very fine sandy loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—3 percent
- Inclusion 3: Typic Haplaquolls, 0 to 2 percent slopes—2 percent

### Characteristics of the Cirac Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Black greasewood, shadscale, Indian ricegrass

### Typical Profile

0 to 5 inches—fine sandy loam; 0 to 25 percent pebbles (by weight); platy structure; slightly hard, friable;

very strongly alkaline (pH 9.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-4

5 to 60 inches—stratified gravelly sand to silt loam; 0 to 25 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—February to September

*Permeability:* Moderately rapid

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Dunes

*Contrasting features:* Sandy textures throughout the profile, slopes greater than 4 percent

*Distinctive present vegetation:* Black greasewood, littleleaf horsebrush, Indian ricegrass

#### Inclusion 2

*Position on landscape:* Lower parts of inset fans

*Contrasting features:* More than 18 percent clay throughout the profile

#### Inclusion 3

*Position on landscape:* Inset fans adjacent to Whiskey Spring

*Contrasting features:* Thick dark-colored surface layer, water table at a depth of 12 to 24 inches

*Distinctive present vegetation:* Basin wildrye, inland saltgrass, basin big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Cirac Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Moderate—flooding

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* IIIw, irrigated, and VIIw, nonirrigated

*Range site:* 027X025N

## 1940—Typic Torriorthents, 15 to 75 percent slopes

### Map Unit Setting

*Position on landscape:* Fan piedmont remnants

*Elevation:* 5,000 to 6,000 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Typic Torriorthents, very gravelly loamy sand, 15 to 75 percent slopes (Typic Torriorthents)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Izo extremely gravelly loamy sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Candelaria very gravelly fine sandy loam, dry, 4 to 15 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—5 percent

### Characteristics of the Typic Torriorthents

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### Reference Profile

0 to 6 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 2

*Position on landscape:* Summits of fan piedmont remnants

*Contrasting features:* Layer of lime accumulation at a depth of 6 to 15 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Typic Torriorthents for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X033N

## 1950—Lathrop-Terlco-Izo association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Lathrop very gravelly sandy loam, 2 to 8 percent slopes (Duric Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—40 percent
  - Terlco very gravelly fine sandy loam, 8 to 30 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—35 percent
  - Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Typic Torriorthents, very gravelly loamy sand, 30 to 50 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
  - Inclusion 2: Pintwater very gravelly sandy loam, 15 to 30 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
  - Inclusion 3: Annaw very gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Lathrop Soil

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta, Indian ricegrass

### Typical Profile

0 to 5 inches—very gravelly sandy loam; 0 to 5 percent

cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

5 to 13 inches—clay loam, loam, gravelly sandy clay loam; 0 to 15 percent cobbles and stones, 15 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, GC, CL; estimated AASHTO classification—A-6

13 to 25 inches—extremely cobbly loamy sand, very gravelly loamy coarse sand, very cobbly sand; 15 to 65 percent cobbles and stones, 60 to 90 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, SP, GP, SP-SM; estimated AASHTO classification—A-1

25 to 60 inches—extremely cobbly sand, very gravelly loamy coarse sand, very cobbly sand; 15 to 65 percent cobbles and stones, 60 to 90 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP, SP, GP-GM, SP-SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Terlco Soil

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta, Indian ricegrass

### Typical Profile

0 to 2 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7

11 to 18 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Burrobrush, rabbitbrush, Indian ricegrass

#### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP-SM, SP; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 30 percent

##### **Inclusion 2**

*Position on landscape:* Hills

*Contrasting features:* Bedrock within a depth of 20 inches

##### **Inclusion 3**

*Position on landscape:* Remnants of inset fans

*Contrasting features:* No horizon of clay accumulation, rarely flooded

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

##### **Ratings of the Lathrop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too sandy, small stones, too crusty

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—large stones

*Gravel:* Improbable source—large stones

*Embankments, dikes, and levees:* Severe—seepage, large stones

##### **Ratings of the Terlco Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope, large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

##### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

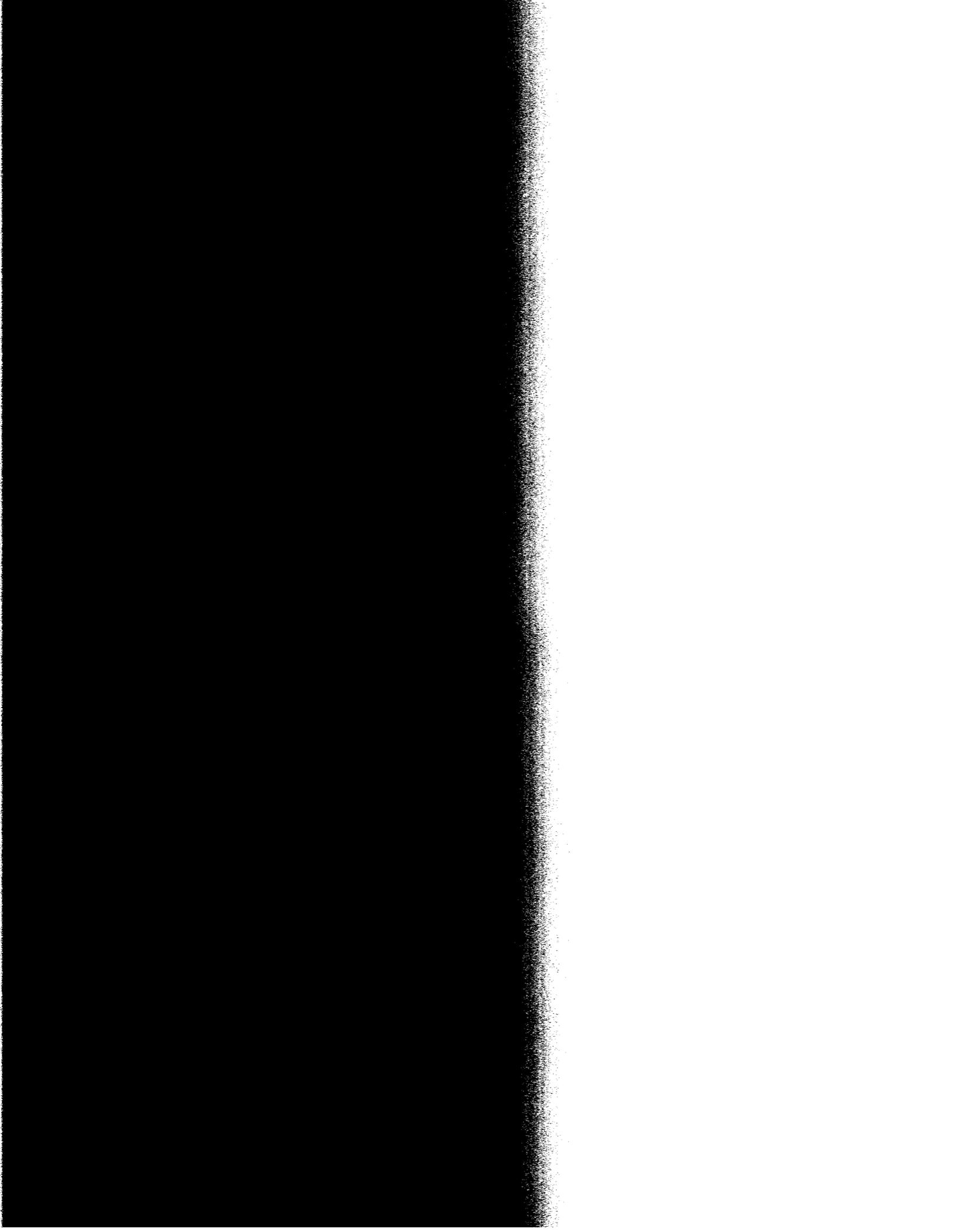
*Gravel:* Probable source

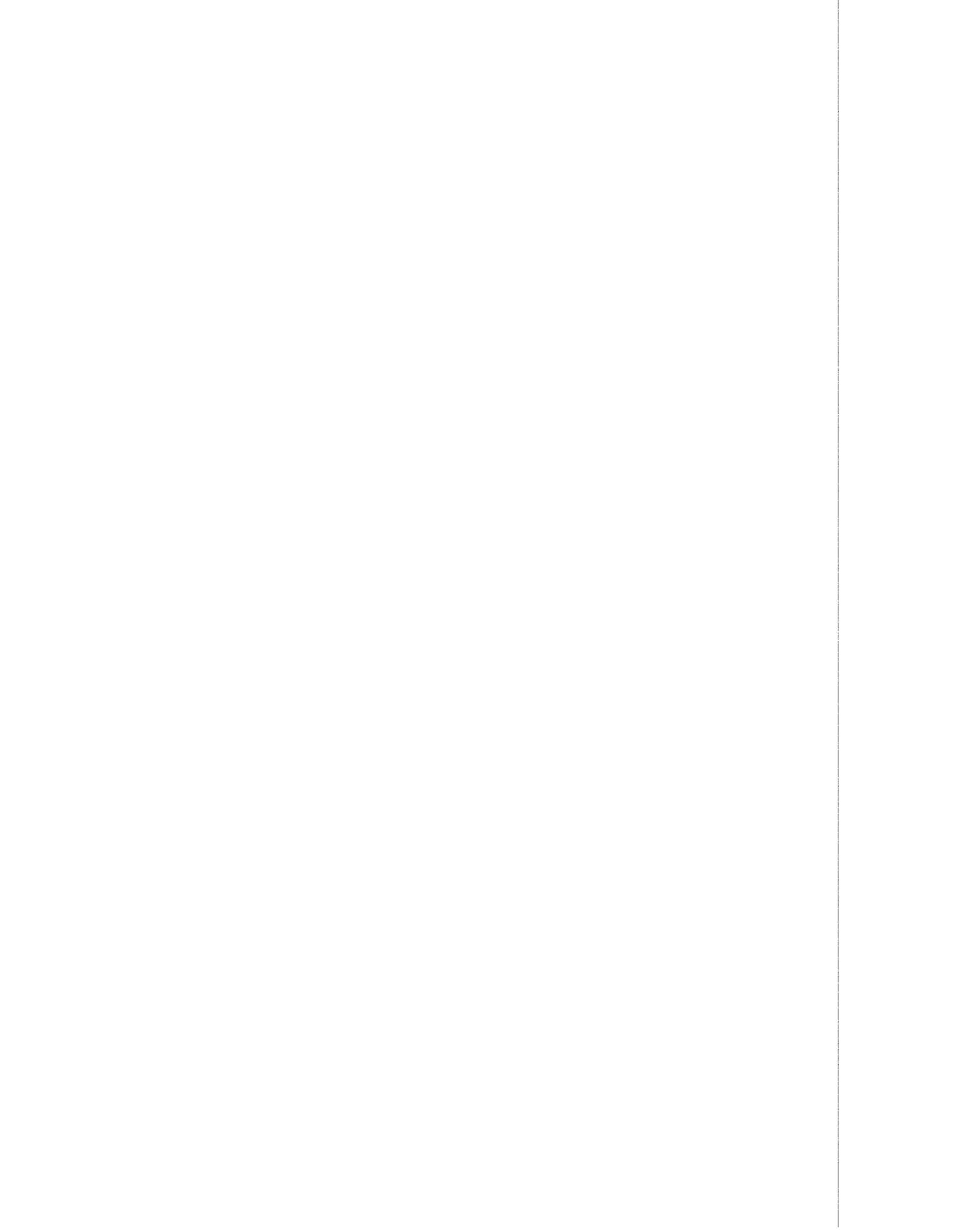
*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Lathrop soil—VII<sub>s</sub>, nonirrigated; Terlco soil—VII<sub>s</sub>, nonirrigated; Izo soil—VII<sub>w</sub>, nonirrigated

*Range site:* Lathrop soil—029X036N; Terlco soil—029X036N; Izo soil—029X041N





**1951—Lathrop-Belted-Veet association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,800 to 6,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

**Composition**

*Major components:*

- Lathrop very gravelly sandy loam, 2 to 8 percent slopes (Duric Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—45 percent
- Belted very cobbly sandy loam, moist, 2 to 8 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—30 percent
- Veet very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Durixerollic Haplargids, very cobbly loam, 8 to 30 percent slopes (Durixerollic Haplargids, loamy-skeletal, mixed, mesic)—4 percent
- Inclusion 2: Handpah very cobbly sandy loam, 2 to 8 percent slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—4 percent
- Inclusion 3: Typic Torriorthents, very gravelly sandy loam, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 4: Xeric Torrifluents, 2 to 8 percent slopes (Xeric Torrifluents, sandy-skeletal, mixed, mesic)—3 percent

**Characteristics of the Lathrop Soil**

*Position on landscape:* Slightly lower fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta, Indian ricegrass

**Typical Profile**

- 0 to 3 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2
- 3 to 13 inches—clay loam, loam, gravelly sandy clay loam; 0 to 15 percent cobbles and stones, 15 to 45

percent pebbles (by weight); prismatic structure parting to subangular blocky; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, GC, CL; estimated AASHTO classification—A-6

- 13 to 32 inches—extremely cobbly loamy sand, very gravelly loamy coarse sand, very cobbly sand; 15 to 65 percent cobbles and stones, 60 to 90 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, SP, GP, SP-SM; estimated AASHTO classification—A-1
- 32 to 60 inches—extremely cobbly sand, very gravelly loamy coarse sand, very cobbly sand; 15 to 65 percent cobbles and stones, 60 to 90 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP, SP, GP-GM, SP-SM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Belted Soil**

*Position on landscape:* Slightly higher summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Bailey greasewood, galleta

**Typical Profile**

- 0 to 2 inches—very cobbly sandy loam; 30 to 45 percent cobbles and stones, 40 to 55 percent pebbles (by weight); platy structure; soft, very

friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

2 to 7 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; slightly hard, very friable; very strongly alkaline (pH 9.4); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC; estimated AASHTO classification—A-6

7 to 31 inches—strongly cemented duripan

31 to 60 inches—extremely gravelly coarse sand, very gravelly coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to hardpan:* 6 to 14 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—moderately slow; below the duripan—rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

#### Characteristics of the Veet Soil

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

#### Typical Profile

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR

less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Side slopes of fan piedmont remnants at higher elevations  
*Contrasting features:* Slopes of more than 8 percent  
*Distinctive present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta

##### Inclusion 2

*Position on landscape:* Summits of fan piedmont remnants at higher elevations  
*Contrasting features:* Less than 35 percent rock fragments throughout the profile, higher water-supplying capacity than Belted and Lathrop soils  
*Distinctive present vegetation:* Wyoming big sagebrush, galleta

##### Inclusion 3

*Position on landscape:* Lower elevation channels  
*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Spiny hopsage, rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Higher elevation channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Lathrop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones, too crusty

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—large stones

*Gravel:* Improbable source—large stones

*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Belted Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Lathrop soil—VIIs, nonirrigated; Belted soil—VIIs, nonirrigated; Veet soil—VIIs, nonirrigated

*Range site:* Lathrop soil—029X036N; Belted soil—29X036N; Veet soil—029X049N

## **1970—Pintwater-Blacktop-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains and hills

*Elevation:* 5,000 to 6,700 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Pintwater very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—50 percent
- Blacktop very gravelly sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—25 percent
- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Lithic Xeric Torriorthents, very gravelly fine sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
- Inclusion 2: Typic Haplargids, very gravelly sandy loam, 8 to 30 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Pintwater Soil**

*Position on landscape:* Crests of shoulder slopes and back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta

### **Typical Profile**

0 to 6 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 11 inches—very gravelly fine sandy loam, extremely gravelly sandy loam; 0 to 15 percent cobbles and stones, 60 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Blacktop Soil

*Position on landscape:* Back slopes of hills and mountains

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass

### Typical Profile

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Higher north-facing back slopes of mountains

*Slope features:* Shape—concave

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### Inclusion 2

*Position on landscape:* Toe slopes of hills and mountains

*Contrasting features:* Layer of clay accumulation, bedrock at a depth of more than 20 inches

#### Inclusion 3

*Position on landscape:* Higher north-facing shoulder slopes of mountains

*Contrasting features:* Layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, galleta

#### Inclusion 4

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Pintwater Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, thin layer

#### **Ratings of the Blacktop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, too arid, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Pintwater soil—VIIs, nonirrigated; Blacktop soil—VIIs, nonirrigated; Rock outcrop—VIIIs  
*Range site:* Pintwater soil—029X037N; Blacktop soil—029X033N

### **1972—Pintwater-Terlco association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and hills  
*Elevation:* 5,000 to 5,400 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

#### **Composition**

##### *Major components:*

- Pintwater gravelly fine sandy loam, 8 to 30 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—50 percent
- Terlco very gravelly sandy loam, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—35 percent

##### *Contrasting inclusions:*

- Inclusion 1: Annaw gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Izo very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Blacktop very gravelly loamy sand, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—4 percent
- Inclusion 4: Lomoine gravelly sandy loam, dry, 15 to

50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent

#### **Characteristics of the Pintwater Soil**

*Position on landscape:* Side slopes and crests of hills; summits and side slopes of rock pediment remnants  
*Parent material:* Kind—residuum and colluvium; source—volcanic rock  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta

#### **Typical Profile**

0 to 6 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-1  
 6 to 11 inches—very gravelly fine sandy loam, extremely gravelly sandy loam; 0 to 15 percent cobbles and stones, 60 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1  
 11 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

#### **Characteristics of the Terlco Soil**

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, Bailey greasewood, shadscale, galleta

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7

11 to 18 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of inset fans  
*Contrasting features:* Bedrock at a depth of more than 60 inches, no layer of clay accumulation, rarely flooded

#### Inclusion 2

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* More eroded side slopes of hills  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale

#### Inclusion 4

*Position on landscape:* North-facing back slopes and shoulder slopes of hills at upper elevations  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Black sagebrush, Sandberg bluegrass, galleta

#### Other inclusions (in only a few areas):

*Position on landscape:* Rock outcrop  
 Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Pintwater Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, thin layer

#### Ratings of the Terico Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### **Interpretive Groups**

*Capability classification:* Pintwater soil—VIIIs, nonirrigated; Terlco soil—VIIIs, nonirrigated

*Range site:* Pintwater soil—029X037N; Terlco soil—029X036N

## **1980—Tert-Whilphang-Armespan association**

### **Map Unit Setting**

*Position on landscape:* Remnants of pediments

*Elevation:* 6,000 to 7,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Tert loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—40 percent
- Whilphang very gravelly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—40 percent
- Armespan very gravelly sandy loam, 2 to 8 percent slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Wrango very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

### **Characteristics of the Tert Soil**

*Position on landscape:* Side slopes of the more eroded remnants of pediments

*Parent material:* Kind—residuum; source—Tertiary lacustrine sedimentary rocks

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Utah juniper, Mexican cliffrose, galleta

### **Typical Profile**

0 to 3 inches—loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately

alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

3 to 60 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 2 to 5 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About ½ inch

*Water-supplying capacity:* About 4 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—1; wind erodibility group—4L

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Whilphang Soil**

*Position on landscape:* Side slopes of remnants of pediments

*Parent material:* Kind—residuum and colluvium; source—Tertiary lacustrine sediments mixed with alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, spiny menodora

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

1 to 11 inches—gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4

11 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Moderate

### **Characteristics of the Armespan Soil**

*Position on landscape:* Summits of remnants of pediments

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, spiny menodora

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 9 inches—sandy loam, gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 10 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

9 to 19 inches—gravelly sandy loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

19 to 31 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

31 to 60 inches—very gravelly loamy coarse sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3.5 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Remnants of inset fans

*Contrasting features:* Rarely flooded

*Distinctive present vegetation:* Spiny hopsage

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Tert Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to rock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Whilphang Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Armespan Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—small stones, too crusty, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—frost action  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Tert soil—VIIs, nonirrigated; Whilphang soil—VIIs, nonirrigated; Armespan soil—VIIs, nonirrigated  
*Range site:* Tert soil—027X066N; Whilphang soil—029X008N; Armespan soil—029X008N

### **1981—Tert-Whilphang-Geer association**

#### **Map Unit Setting**

*Position on landscape:* Rock pediment remnants  
*Elevation:* 5,800 to 6,600 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

#### **Composition**

##### *Major components:*

- Tert loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—45 percent
  - Whilphang sandy loam, 4 to 15 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—25 percent
  - Geer fine sandy loam, 2 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Xerollic Haplargids, sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—10 percent
  - Inclusion 2: Koyen gravelly sandy loam, 2 to 8 percent

slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—2 percent

- Inclusion 3: Badland—2 percent
- Inclusion 4: Rock outcrop—1 percent

#### **Characteristics of the Tert Soil**

*Position on landscape:* Back slopes of rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—Tertiary lacustrine sedimentary rocks

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Utah juniper, Mexican cliffrose, galleta

#### **Typical Profile**

0 to 3 inches—loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

3 to 60 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 2 to 5 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About ½ inch

*Water-supplying capacity:* About 4 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—1; wind erodibility group—4L

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### **Characteristics of the Whilphang Soil**

*Position on landscape:* Toe slopes of rock pediment remnants

*Parent material:* Kind—residuum and colluvium; source—Tertiary lacustrine sediments mixed with alluvium

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, Sandberg bluegrass, galleta

**Typical Profile**

- 0 to 1 inch—sandy loam; 10 to 25 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2
- 1 to 11 inches—gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4
- 11 inches—weathered bedrock

**Soil and Water Features**

- Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Moderate

**Characteristics of the Geer Soil**

- Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Winterfat, Indian ricegrass

**Typical Profile**

- 0 to 14 inches—fine sandy loam; subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4
- 14 to 60 inches—stratified fine sandy loam to silt loam; massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 9 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Toe slopes of rock pediment remnants  
*Contrasting features:* Layer of clay accumulation, soft bedrock at a depth of 14 to 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**

- Position on landscape:* Fanettes  
*Contrasting features:* Strata of gravelly material, soft bedrock at a depth of more than 60 inches  
*Distinctive present vegetation:* Spiny hopsage, Bailey greasewood, fourwing saltbush

**Inclusion 3**

- Position on landscape:* Bedrock exposed on back slopes of rock pediment remnants  
*Contrasting features:* Exposed bedrock  
*Distinctive present vegetation:* None

**Inclusion 4**

- Position on landscape:* Scattered small peaks and ridges, mostly on shoulder slopes and crests of rock pediment remnants  
*Contrasting features:* Exposed bedrock  
*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Tert Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Whilphang Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—depth to bedrock, slope, frost action

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Geer Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—good; domestic grasses and legumes

(irrigated)—good; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

#### **Interpretive Groups**

*Capability classification:* Tert soil—VIIs, nonirrigated; Whilphang soil—VIIs, nonirrigated; Geer soil—IIc, irrigated, and VIIc, nonirrigated

*Range site:* Tert soil—027X066N; Whilphang soil—029X008N; Geer soil—029X020N

### **1982—Tert-Badland association**

#### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 6,000 to 7,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 120 days

#### **Composition**

*Major components:*

- Tert loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—70 percent

- Badland—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Haplargids, gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—5 percent

- Inclusion 2: Tert loam, 4 to 8 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—5 percent

- Inclusion 3: Wrango gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Rock outcrop—2 percent

#### **Characteristics of the Tert Soil**

*Position on landscape:* Crests and side slopes of hills

*Parent material:* Kind—residuum; source—Tertiary lacustrine sedimentary rocks

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Utah juniper, Mexican cliffrose, galleta

#### **Typical Profile**

0 to 3 inches—loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

3 to 60 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 2 to 5 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About ½ inch

*Water-supplying capacity:* About 4 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—1; wind erodibility group—4L

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### **Characteristics of the Badland**

*Position on landscape:* Areas of exposed sedimentary rock

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Layer of clay accumulation, soft bedrock at a depth of 10 to 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Crests and toe slopes of hills

*Contrasting features:* Slopes of less than 8 percent

#### Inclusion 3

*Position on landscape:* Remnants of inset fans

*Contrasting features:* Bedrock at a depth of more than 60 inches, more than 35 percent rock fragments at a depth of 10 to 60 inches, rarely flooded

*Distinctive present vegetation:* Black sagebrush, spiny hopsage, bud sagebrush

#### Inclusion 4

*Position on landscape:* Scattered small peaks and ridges, mostly on crests of dissected hills

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Tert Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Tert soil—VIIs, nonirrigated; Badland—VIIIs

*Range site:* Tert soil—027X066N

### 1983—Tert-Roic association

#### Map Unit Setting

*Position on landscape:* Hills

*Elevation:* 5,300 to 5,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

#### Major components:

- Tert loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—55 percent

- Roic gravelly sandy loam, 4 to 15 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—30 percent

#### Contrasting inclusions:

- Inclusion 1: Whilphang gravelly sandy loam, 4 to 15 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—10 percent

- Inclusion 2: Isolde fine sand, 8 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent

### Characteristics of the Tert Soil

*Position on landscape:* Higher, more eroded back slopes of hills

*Parent material:* Kind—residuum; source—Tertiary lacustrine sedimentary rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, Utah juniper, Mexican cliffrose, galleta

### Typical Profile

0 to 3 inches—loam; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

3 to 60 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 2 to 5 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About ½ inch

*Water-supplying capacity:* About 4 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.43; T value—1; wind erodibility group—4L

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Roic Soil

*Position on landscape:* Less eroded toe slopes of hills

*Parent material:* Kind—residuum; source—Tertiary lacustrine materials

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

### Typical Profile

0 to 2 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, Sandberg bluegrass, galleta

#### Inclusion 2

*Position on landscape:* East-facing back slopes and shoulder slopes of hills

*Contrasting features:* Sandy throughout the profile, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Tert Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Roic Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Tert soil—VIIs, nonirrigated; Roic soil—VIIs, nonirrigated

*Range site:* Tert soil—027X066N; Roic soil—029X017N

## 1990—Whilphang-Armespan association

### Map Unit Setting

*Position on landscape:* Fan piedmonts surrounding hills

*Elevation:* 6,300 to 6,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 120 days

### Composition

*Major components:*

- Whilphang very gravelly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—50 percent

- Armespan very gravelly sandy loam, 4 to 15 percent slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Wrango gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Tert loam, 15 to 50 percent slopes (Xeric

Torrorthents, loamy, mixed [calcareous], mesic, shallow)—5 percent

• Inclusion 3: Xeric Torrorthents, sandy loam, 2 to 4 percent slopes (Xeric Torrorthents, loamy, mixed, mesic, shallow)—3 percent

### **Characteristics of the Whilphang Soil**

*Position on landscape:* Side slopes of fan piedmont remnants

*Parent material:* Kind—residuum and colluvium; source—Tertiary lacustrine sediments mixed with alluvium

*Slope features:* Length—very short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, galleta, spiny menodora

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

1 to 11 inches—gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4

11 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Moderate

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Moderate

### **Characteristics of the Armespan Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, spiny menodora

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 9 inches—sandy loam, gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 10 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

9 to 19 inches—gravelly sandy loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

19 to 31 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

31 to 60 inches—very gravelly loamy coarse sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3.5 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans  
*Contrasting features:* Bedrock at a depth of more than 60 inches, rarely flooded  
*Distinctive present vegetation:* Spiny hopsage, bud sagebrush

#### **Inclusion 2**

*Position on landscape:* More eroded side slopes of fan piedmont remnants  
*Contrasting features:* Lower water-supplying capacity, weathered bedrock within a depth of 10 inches  
*Distinctive present vegetation:* Utah juniper, Mexican cliffrose

#### **Inclusion 3**

*Position on landscape:* Toe slopes of fan piedmont remnants  
*Contrasting features:* Slopes of less than 4 percent, rarely flooded, higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Whilphang Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Severe—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Armespan Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—small stones, too crusty, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—slope, frost action  
*Roadfill:* Good  
*Sand:* Probable source

*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Whilphang soil—VIIs, nonirrigated; Armespan soil—VIIs, nonirrigated  
*Range site:* Whilphang soil—029X008N; Armespan soil—029X008N

## **2002—Sodaspring-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,500 to 5,600 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 140 days

### **Composition**

*Major components:*

- Sodaspring loamy sand, 2 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—70 percent
  - Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Eastgate gravelly sandy loam, 2 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—8 percent
  - Inclusion 2: Gynelle gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
  - Inclusion 3: Cirac sandy loam, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—2 percent

### **Characteristics of the Sodaspring Soil**

*Position on landscape:* Slightly higher fan skirts  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Cooper wolfberry, Bailey greasewood, shadscale, Indian ricegrass  
*Percent of surface covered by rock fragments:* 20 percent pebbles, 4 percent cobbles

### **Typical Profile**

0 to 7 inches—loamy sand; 0 to 10 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.9); nonsaline (less than 2 mmhos/cm);

nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1

7 to 60 inches—stratified gravelly coarse sand to sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); moderately sodic to strongly sodic (SAR 30 to 50); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bailey greasewood, rubber rabbitbrush, burrobrush

### Typical Profile

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly lower fan skirts

*Contrasting features:* Less than 35 percent rock fragments at a depth of less than 35 inches, sandy textures at a depth of more than 10 inches

#### Inclusion 2

*Position on landscape:* Upper parts of fan skirts

*Contrasting features:* More than 35 percent rock fragments throughout the profile, rarely flooded

#### Inclusion 3

*Position on landscape:* Lower parts of fan skirts

*Contrasting features:* Slopes of less than 2 percent, less than 35 percent rock fragments throughout the profile, occasionally flooded,

*Distinctive present vegetation:* Cooper wolfberry, black greasewood

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Sodaspring Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Sodaspring soil—IVs, irrigated, and VIIs, nonirrigated; Izo soil—VIIw, nonirrigated  
*Range site:* Sodaspring soil—027X043N; Izo soil—029X041N

### **2011—Nuahs loamy sand, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,400 to 5,400 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 140 days

#### **Composition**

*Major components:*

- Nuahs loamy sand, 0 to 4 percent slopes (Typic Calciorthids, coarse-loamy, mixed, mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Calciorthids, gravelly sandy loam, 0 to 4 percent slopes (Typic Calciorthids, coarse-loamy, mixed, mesic)—5 percent
- Inclusion 2: Typic Torriorthents, loamy sand, 0 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Sodaspring loamy sand, 0 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed, mesic)—1 percent

#### **Characteristics of the Nuahs Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Mixed alluvium; source—dominantly granite and rhyolite  
*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Cooper wolfberry, Bailey greasewood, shadscale, Indian ricegrass

#### **Typical Profile**

0 to 4 inches—loamy sand; 0 to 10 percent cobbles and stones, 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

4 to 18 inches—sandy loam, coarse sandy loam; 0 to 10 percent cobbles and stones, 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-2

18 to 60 inches—stratified fine sandy loam to very gravelly loamy coarse sand; 0 to 15 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Slightly higher fan skirts  
*Contrasting features:* Vesicular surface  
*Distinctive present vegetation:* Bud sagebrush, Cooper wolfberry, shadscale

##### **Inclusion 2**

*Position on landscape:* Channels and fan aprons  
*Contrasting features:* More than 35 percent rock fragments throughout the profile, rarely flooded

**Inclusion 3**

*Position on landscape:* Lower parts of fan skirts

*Contrasting features:* No layer of lime accumulation at a depth of less than 12 inches, rarely flooded

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

**Ratings of the Nuahs Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, excess sodium

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

**Interpretive Groups**

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 027X043N

**2020—Armespan-Whilphang-Wrango association****Map Unit Setting**

*Position on landscape:* Fan piedmonts surrounding hills

*Elevation:* 5,600 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 120 days

**Composition**

*Major components:*

- Armespan very gravelly sandy loam, 2 to 8 percent slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—40 percent
- Whilphang very gravelly sandy loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—25 percent
- Wrango very gravelly loamy sand, 2 to 8 percent

slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Tert loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—5 percent
- Inclusion 2: Zadvar very gravelly sandy loam, 2 to 8 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—4 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Candelaria very gravelly sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—3 percent

**Characteristics of the Armespan Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, spiny menodora

*Percent of surface covered by rock fragments:* 40 percent pebbles

**Typical Profile**

- 0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 1 to 9 inches—sandy loam, gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 10 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 9 to 19 inches—gravelly sandy loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4
- 19 to 31 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 10 percent cobbles

and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

31 to 60 inches—very gravelly loamy coarse sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3.5 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

#### **Characteristics of the Whilphang Soil**

*Position on landscape:* Side slopes of fan piedmont remnants  
*Parent material:* Kind—residuum and colluvium; source—Tertiary lacustrine sediments mixed with alluvium  
*Slope features:* Length—very short; shape—concave to convex  
*Dominant present vegetation:* Black sagebrush, galleta, spiny menodora  
*Percent of surface covered by rock fragments:* 60 percent pebbles, 5 percent cobbles, 1 percent stones

#### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC;

estimated AASHTO classification—A-1, A-2  
 1 to 11 inches—gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4  
 11 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Moderate

#### **Characteristics of the Wrango Soil**

*Position on landscape:* Remnants of inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Black sagebrush, spiny hopsage, Nevada ephedra, Indian ricegrass

#### **Typical Profile**

0 to 4 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1  
 4 to 10 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM, GM-GC, SM-SC; estimated AASHTO classification—A-1, A-2  
 10 to 60 inches—stratified extremely gravelly sand to extremely gravelly loamy coarse sand; 5 to 30 percent cobbles and stones, 70 to 85 percent pebbles (by weight); single grained; loose;

moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* More eroded side slopes of fan piedmont remnants  
*Contrasting features:* Weathered bedrock at a depth of less than 5 inches  
*Distinctive present vegetation:* Utah juniper, purple sage, black sagebrush

#### Inclusion 2

*Position on landscape:* Summits of fan piedmont remnants  
*Contrasting features:* Cemented pan within a depth of 20 inches, layer of clay accumulation

#### Inclusion 3

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 4

*Position on landscape:* Lower elevation summits of fan piedmont remnants  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Armespan Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—small stones, too crusty  
*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Whilphang Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Wrango Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Improbable source—small stones  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Armespan soil—VII<sub>1</sub>, nonirrigated; Whilphang soil—VII<sub>1</sub>, nonirrigated; Wrango soil—VII<sub>1</sub>, nonirrigated  
*Range site:* Armespan soil—029X008N; Whilphang soil—029X008N; Wrango soil—028X011N

## 2022—Armespan-Whilphang-Geer association

### Map Unit Setting

*Position on landscape:* Fan piedmonts surrounding hills  
*Elevation:* 6,000 to 6,500 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Armespan very gravelly sandy loam, 2 to 8 percent slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—40 percent
- Whilphang gravelly sandy loam, 8 to 30 percent

slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—25 percent

- Geer fine sandy loam, 2 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Tert loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—7 percent

- Inclusion 2: Wrango gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Haarvar gravelly clay loam, 8 to 30 percent slopes (Xeric Torriorthents, clayey, montmorillonitic [calcareous], mesic, shallow)—2 percent

- Inclusion 4: Veet loamy sand, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Armespan Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, spiny menodora

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 9 inches—sandy loam, gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 10 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

9 to 19 inches—gravelly sandy loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

19 to 31 inches—very gravelly sandy loam, very

gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

31 to 60 inches—very gravelly loamy coarse sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3.5 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Whilphang Soil**

*Position on landscape:* Back slopes of fan piedmont remnants

*Parent material:* Kind—residuum and colluvium; source—Tertiary lacustrine sediments mixed with alluvium

*Slope features:* Length—very short; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, galleta, spiny menodora

### **Typical Profile**

0 to 1 inch—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC; estimated AASHTO classification—A-2

1 to 11 inches—gravelly loam; 0 to 5 percent cobbles

and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-2, A-4

11 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Moderate

### Characteristics of the Geer Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Winterfat, Indian ricegrass

### Typical Profile

0 to 14 inches—fine sandy loam; subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

14 to 60 inches—stratified fine sandy loam to silt loam; massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 9 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Soft bedrock within a depth of 5 inches

*Distinctive present vegetation:* Utah juniper, black sagebrush, galleta

#### Inclusion 2

*Position on landscape:* Remnants of inset fans and toe slopes of fan piedmont remnants

*Contrasting features:* More than 35 percent rock fragments throughout the profile, rarely flooded

*Distinctive present vegetation:* Black sagebrush, spiny hopsage, winterfat

#### Inclusion 3

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Averages more than 35 percent clay throughout the profile

#### Inclusion 4

*Position on landscape:* Remnants of inset fans

*Contrasting features:* More than 35 percent rock fragments throughout the profile, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Armespan Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—small stones, too crusty, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Whilphang Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Geer Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

#### **Interpretive Groups**

*Capability classification:* Armespan soil—VII<sub>s</sub>, nonirrigated; Whilphang soil—VII<sub>e</sub>, nonirrigated; Geer soil—II<sub>c</sub>, irrigated, and VII<sub>c</sub>, nonirrigated

*Range site:* Armespan soil—029X008N; Whilphang soil—029X008N; Geer soil—029X020N

### **2023—Armespan-Wrango association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,300 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 120 days

#### **Composition**

*Major components:*

- Armespan very gravelly sandy loam, 2 to 8 percent slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—60 percent

- Wrango gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Armespan very gravelly sandy loam, 8 to 15 percent slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Candelaria stony sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Typic Torriorthents, very gravelly sandy loam, 2 to 8 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

#### **Characteristics of the Armespan Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, spiny menodora

#### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 9 inches—sandy loam, gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 10 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

9 to 19 inches—gravelly sandy loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

19 to 31 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); moderately saline (8 to 16 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

31 to 60 inches—very gravelly loamy coarse sand, very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, SP-SM,

GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3.5 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Wrango Soil

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Black sagebrush, spiny hopsage, Nevada ephedra, Indian ricegrass

### Typical Profile

0 to 3 inches—gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 to 10 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2

10 to 60 inches—extremely gravelly sand, extremely gravelly loamy coarse sand, extremely gravelly loamy sand; 5 to 30 percent cobbles and stones, 70 to 85 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

#### Inclusion 2

*Position on landscape:* Side slopes of fan piedmont remnants at lower elevations

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### Inclusion 3

*Position on landscape:* Remnants of inset fans at lower elevations

*Contrasting features:* Lower water-supplying capacity, no layer of lime accumulation

*Distinctive present vegetation:* Winterfat, Indian ricegrass, galleta

#### Inclusion 4

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Armespan Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—small stones, too crusty, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—see page

**Ratings of the Wrango Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Armespan soil—VIIs, nonirrigated; Wrango soil—VIIs, nonirrigated

*Range site:* Armespan soil—029X008N; Wrango soil—028X011N

**2030—Theriot-Theriot, very steep-Rock outcrop association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,000 to 6,300 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Theriot very gravelly sandy loam, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—45 percent

- Theriot very gravelly sandy loam, dry, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—20 percent

- Rock outcrop—20 percent

*Contrasting inclusions:*

- Inclusion 1: Kyler very gravelly fine sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—7 percent

- Inclusion 2: Izo very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Eaglepass very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—3 percent

**Characteristics of the Less Sloping Theriot Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—limestone and dolomite

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Spiny menodora, Nevada ephedra, Bailey greasewood, galleta

**Typical Profile**

0 to 3 inches—very gravelly sandy loam; 20 to 35 percent cobbles and stones, 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

3 to 14 inches—very stony loam, very cobbly loam, very gravelly sandy loam; 20 to 55 percent cobbles and stones, 25 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4

14 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Very Steep Theriot Soil**

*Position on landscape:* More eroded side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—limestone and dolomite

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

**Typical Profile**

0 to 3 inches—very gravelly sandy loam; 20 to 35 percent cobbles and stones, 35 to 60 percent

pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

3 to 14 inches—very stony loam, very cobbly loam, very gravelly sandy loam; 20 to 55 percent cobbles and stones, 25 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing side slopes at higher elevations

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, galleta, Sandberg bluegrass

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### Inclusion 3

*Position on landscape:* Side slopes of mountains on calcite

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Cooler soil temperature, higher percentage of calcium carbonate

*Distinctive present vegetation:* Littleleaf mountainmahogany

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Less Sloping Theriot Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, seepage

### Ratings of the Very Steep Theriot Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—seepage, large stones

### Interpretive Groups

*Capability classification:* Theriot soil—VII<sub>s</sub>, nonirrigated; very steep Theriot soil—VII<sub>s</sub>, nonirrigated; Rock outcrop—VIII<sub>s</sub>

*Range site:* Theriot soil—029X037N; very steep Theriot soil—029X033N

## 2031—Theriot-Eaglepass-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 5,000 to 6,300 feet

*Precipitation:* About 8 inches

*Air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Theriot very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—45 percent

- Eaglepass very stony sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—30 percent

- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Pintwater very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—6 percent

- Inclusion 2: Lomoiné very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

- Inclusion 3: Izo very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Kyler very gravelly fine sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—3 percent

### **Characteristics of the Theriot Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—limestone and dolomite

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Spiny menodora, Nevada ephedra, Bailey greasewood, desert needlegrass

*Percent of surface covered by rock fragments:* 50 percent pebbles, 5 percent cobbles

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 20 to 35 percent cobbles and stones, 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

3 to 10 inches—very stony loam, very cobbly loam, very gravelly sandy loam; 20 to 55 percent cobbles and stones, 25 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—

GM, SM; estimated AASHTO classification—A-1, A-2, A-4

10 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Eaglepass Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Littleleaf mountainmahogany, black sagebrush, Nevada greasewood

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 1 inch—very stony sandy loam; 15 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 3 inches—extremely stony loam, very cobbly fine sandy loam, extremely gravelly sandy loam; 25 to 45 percent cobbles and stones, 40 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 6 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges  
*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Side slopes of mountains on volcanic rocks

*Contrasting features:* Less calcium carbonate

#### **Inclusion 2**

*Position on landscape:* North-facing side slopes on granite

*Contrasting features:* Higher water-supplying capacity, less calcium carbonate

*Distinctive present vegetation:* Black sagebrush

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### **Inclusion 4**

*Position on landscape:* North-facing side slopes on limestone

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Theriot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope, large stones  
*Local roads and streets:* Severe—depth to bedrock, slope, large stones  
*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones  
*Gravel:* Improbable source—excess fines, large stones  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Ratings of the Eaglepass Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Interpretive Groups**

*Capability classification:* Theriot soil—VIIIs, nonirrigated; Eaglepass soil—VIIIs; Rock outcrop—VIIIIs  
*Range site:* Theriot soil—029X037N; Eaglepass soil—029X040N

## **2032—Theriot-Kyler-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 5,400 to 6,700 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Theriot very gravelly sandy loam, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—45 percent
- Kyler very gravelly fine sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—30 percent
- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Theriot very cobbly sandy loam, dry, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent
- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Pintwater very gravelly sandy loam, 30 to

50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

• Inclusion 4: Kyler very gravelly fine sandy loam, 8 to 30 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—3 percent

### **Characteristics of the Theriot Soil**

*Position on landscape:* South-facing back slopes and shoulder slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—limestone and dolomite

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Spiny menodora, Nevada ephedra, Bailey greasewood, galleta, desert needlegrass

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 20 to 35 percent cobbles and stones, 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

3 to 14 inches—very stony loam, very cobbly loam, very gravelly sandy loam; 20 to 55 percent cobbles and stones, 25 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Kyler Soil**

*Position on landscape:* North-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

7 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* More eroded back slopes of mountains

*Contrasting features:* Slopes of more than 50 percent

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* South-facing back slopes of mountains on volcanic rocks

*Contrasting features:* Less calcium carbonate throughout the profile

#### **Inclusion 4**

*Position on landscape:* North-facing shoulder slopes and crests of mountains

*Contrasting features:* Slopes of less than 30 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Theriot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Kyler Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Theriot soil—VIIIs, nonirrigated; Kyler soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Theriot soil—029X037N; Kyler soil—029X014N

## **2080—Roic-Roic, dry, association**

### **Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 5,100 to 5,700 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Roic very gravelly fine sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—65 percent

- Roic very gravelly fine sandy loam, dry, 30 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Koyen gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—5 percent

- Inclusion 2: Typic Haplargids, very gravelly sandy loam, 2 to 15 percent slopes (Typic Haplargids, loamy, mixed, mesic, shallow)—4 percent

- Inclusion 3: Whilphang very gravelly sandy loam, 4 to 30 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—4 percent

- Inclusion 4: Roic loamy sand, overblown, 15 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—2 percent

### **Characteristics of the Roic Soil**

*Position on landscape:* Back slopes and shoulder slopes of hills

*Parent material:* Kind—residuum; source—Tertiary lacustrine materials

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5);

nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Characteristics of the Dry Roic Soil

*Position on landscape:* Back slopes of hills

*Parent material:* Kind—residuum; source—Tertiary lacustrine materials

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### Typical Profile

0 to 2 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of inset fans and fanettes

*Contrasting features:* Bedrock at a depth of more than 60 inches, rarely flooded

*Distinctive present vegetation:* Spiny hopsage, Bailey greasewood, littleleaf horsebrush, shadscale, galleta

#### Inclusion 2

*Position on landscape:* Areas of hill crests and shoulder slopes with a dense surface crust

*Contrasting features:* Layer of clay accumulation

#### Inclusion 3

*Position on landscape:* Higher north-facing back slopes of hills

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, galleta

#### Inclusion 4

*Position on landscape:* Hills with thin sand sheets

*Contrasting features:* Overblown sandy surface

*Distinctive present vegetation:* Littleleaf horsebrush, Indian ricegrass, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Roic Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Dry Roic Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Roic soil—VIIs, nonirrigated; dry  
 Roic soil—VIIs, nonirrigated  
*Range site:* Roic soil—029X017N; dry Roic soil—  
 29X033N

## **2081—Roic-Roic, dry-Badland association**

### **Map Unit Setting**

*Position on landscape:* Hills  
*Elevation:* 5,300 to 5,900 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Roic loamy sand, 4 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—45 percent
- Roic gravelly sandy loam, dry, 30 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—25 percent
- Badland—15 percent

*Contrasting inclusions:*

- Inclusion 1: Koyen gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—8 percent
- Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Typic Torriorthents, very gravelly loamy sand, 30 to 50 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic, shallow)—3 percent
- Inclusion 4: Rock outcrop—1 percent

### **Characteristics of the Roic Soil**

*Position on landscape:* Side slopes of low hills  
*Parent material:* Kind—residuum; source—Tertiary lacustrine materials  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Littleleaf horsebrush, Indian ricegrass, galleta

### **Typical Profile**

0 to 3 inches—loamy sand; 0 to 20 percent pebbles (by

weight); single grained; loose; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

3 to 10 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

10 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Characteristics of the Dry Roic Soil**

*Position on landscape:* Back slopes of hills  
*Parent material:* Kind—residuum; source—Tertiary lacustrine materials  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-

ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—

1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Characteristics of the Badland

*Position on landscape:* Areas of exposed lacustrine sediments

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Bailey greasewood, littleleaf horsebrush, galleta

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### Inclusion 3

*Position on landscape:* Steeper back slopes with very gravelly surface

*Contrasting features:* More than 35 percent rock fragments throughout the profile

#### Inclusion 4

*Position on landscape:* Small ridges of lacustrine sediments, mostly on shoulder slopes of hills

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Roic Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Dry Roic Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Roic soil—VIIe, nonirrigated; dry Roic soil—VIIs, nonirrigated; Badland—VIIIs

*Range site:* Roic soil—029X046N; dry Roic soil—029X033N

## 2082—Roic-Koyen association

### Map Unit Setting

*Position on landscape:* Pediments

*Elevation:* 5,200 to 5,700 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Roic gravelly sandy loam, 4 to 15 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—70 percent
- Koyen gravelly sandy loam, dry, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Tert loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—6 percent
- Inclusion 2: Whilphang gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic, shallow)—5 percent
- Inclusion 3: Izo very gravelly loamy sand, 2 to 8

percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

• Inclusion 4: Geer fine sandy loam, 0 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—2 percent

### **Characteristics of the Roic Soil**

*Position on landscape:* Summits of pediment remnants

*Parent material:* Kind—residuum; source—Tertiary lacustrine materials

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Koyen Soil**

*Position on landscape:* Lower fanettes

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

4 to 45 inches—stratified loam to gravelly loamy sand; 15 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

45 to 60 inches—gravelly loamy sand, very gravelly loamy sand; 45 to 55 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* More eroded back slopes of pediment remnants

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Utah juniper, black sagebrush, galleta

#### **Inclusion 2**

*Position on landscape:* Toe slopes of pediment remnants

*Contrasting features:* Higher water-supplying capacity, receives additional moisture from run-on

*Distinctive present vegetation:* Black sagebrush

### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded, more than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Rabbitbrush, burrobrush

### **Inclusion 4**

*Position on landscape:* Remnants of inset fans adjacent to channels and fanettes

*Contrasting features:* Bedrock at a depth of more than 60 inches, subject to rare sheet flooding, less than 10 percent pebbles throughout the profile

*Distinctive present vegetation:* Winterfat, Indian ricegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Roic Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—depth to bedrock, slope

*Roadfill:* Poor, depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Koyen Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—thin layer, seepage, piping

### **Interpretive Groups**

*Capability classification:* Roic soil—VIIIs, irrigated; Koyen soil—IIIe, irrigated, and VIIC, nonirrigated

*Range site:* Roic soil—029X017N; Koyen soil—029X017N

## **2091—Geer-Veet association**

### **Map Unit Setting**

*Position on landscape:* Inset fans

*Elevation:* 5,800 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Geer fine sandy loam, 2 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—60 percent

- Veet loamy sand, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 2 to 4 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Geer Soil**

*Position on landscape:* Lower parts of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Winterfat, Indian ricegrass

### **Typical Profile**

0 to 10 inches—fine sandy loam; subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

10 to 60 inches—stratified fine sandy loam to silt loam; massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 9 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Veet Soil**

*Position on landscape:* Upper parts of inset fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 3 inches—loamy sand; 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 to 17 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

17 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, sandy textures throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Geer Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Geer soil—IIc, irrigated, and VIIc, nonirrigated; Veet soil—VIIs, nonirrigated

*Range site:* Geer soil—029X020N; Veet soil—029X049N

### **2092—Geer fine sandy loam, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Fan aprons and remnants of inset fans

*Elevation:* 6,300 to 6,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Geer fine sandy loam, 0 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—95 percent

*Contrasting inclusions:*

- Inclusion 1: Crunker stony loamy sand, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Geer Soil**

*Position on landscape:* Remnants of inset fans and fan aprons

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Winterfat, Indian ricegrass

### **Typical Profile**

0 to 10 inches—fine sandy loam; subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

10 to 60 inches—stratified fine sandy loam to silt loam; massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 9 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Upper parts of fan aprons

*Contrasting features:* More than 35 percent rock

fragments throughout the profile, sandy throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Geer Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—good; domestic grasses and legumes

(irrigated)—good; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* IIc, irrigated, and VIIc, nonirrigated

*Range site:* 029X020N

## **2100—Rodad-Theriot-Kyler association**

### **Map Unit Setting**

*Position on landscape:* Hills and mountains

*Elevation:* 6,000 to 7,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Rodad very channery loam, moist, 15 to 50 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic, shallow)—35 percent

- Theriot very stony loam, 5 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—30 percent

- Kyler extremely cobbly loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—8 percent

- Inclusion 2: Blacktop very gravelly sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—4 percent
- Inclusion 3: Gabbvally very stony sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Rodad Soil**

*Position on landscape:* Back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—shale

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Spiny menodora, Nevada ephedra, shadscale, galleta

### **Typical Profile**

0 to 4 inches—very channery loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles and channers (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

4 to 12 inches—very gravelly clay loam, very channery clay; 0 to 15 percent cobbles and stones, 45 to 70 percent pebbles and channers (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

12 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Theriot Soil**

*Position on landscape:* Back slopes of hills and mountains

*Parent material:* Kind—colluvium and residuum; source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### **Typical Profile**

0 to 3 inches—very stony loam; 35 to 55 percent cobbles and stones, 20 to 55 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, ML, SM; estimated AASHTO classification—A-4

3 to 14 inches—very stony loam, very cobbly loam, very gravelly sandy loam; 20 to 55 percent cobbles and stones, 25 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2, A-4

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Kyler Soil**

*Position on landscape:* North-facing back slopes and shoulder slopes of mountains at higher elevations

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass

### Typical Profile

0 to 3 inches—extremely cobbly loam; 40 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

7 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Back slopes of hills and mountains at lower elevations

*Contrasting features:* Slopes of more than 50 percent, lower water-supplying capacity

*Distinctive present vegetation:* Sparse shadscale

#### Inclusion 3

*Position on landscape:* South-facing back slopes of volcanic rock hills and mountains at higher elevations

*Contrasting features:* Less calcium carbonate throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Rodad Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Theriot Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, seepage

#### Ratings of the Kyler Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, large stones

### Interpretive Groups

*Capability classification:* Rodad soil—VIIs, nonirrigated; Theriot soil—VIIs, nonirrigated; Kyler soil—VIIs, nonirrigated

*Range site:* Rodad soil—029X037N; Theriot soil—029X022N; Kyler soil—029X014N

**2101—Rodad-Penelas-Blacktop association****Map Unit Setting**

*Position on landscape:* Flood plains and mountains

*Elevation:* 6,000 to 6,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Rodad very channery loam, moist, 15 to 50 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic, shallow)—50 percent

- Penelas very channery loam, 15 to 50 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—30 percent

- Blacktop very gravelly sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent

- Inclusion 2: Truhoy very gravelly fine sandy loam, 4 to 30 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—4 percent

- Inclusion 3: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—1 percent

**Characteristics of the Rodad Soil**

*Position on landscape:* Crests and shoulder slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—shale

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Spiny menodora, Nevada ephedra, shadscale, galleta

**Typical Profile**

0 to 3 inches—very channery loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

3 to 14 inches—very gravelly clay loam, very channery clay loam; 0 to 15 percent cobbles and stones, 45 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/

cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7

14 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Penelas Soil**

*Position on landscape:* North-facing back slopes and shoulder slopes of hills and mountains

*Parent material:* Kind—residuum; source—shale

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

**Typical Profile**

0 to 7 inches—very channery loam; 0 to 5 percent cobbles and stones, 50 to 75 percent pebbles and channers (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2

7 to 12 inches—extremely shaly silty clay loam, extremely shaly clay loam; 0 to 5 percent cobbles and stones, 75 to 90 percent pebbles and channers (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GP-GC; estimated AASHTO classification—A-2

12 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 5 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Blacktop Soil**

*Position on landscape:* South-facing back slopes of hills and mountains  
*Parent material:* Kind—colluvium; source—volcanic rock  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass

### **Typical Profile**

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1  
 7 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than ½ inch  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Toe slopes of hills and mountains

*Contrasting features:* Cemented pan within a depth of 14 inches

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Depth to bedrock more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Rodad Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Penelas Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Blacktop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Rodad soil—VIIIs, nonirrigated; Penelas soil—VIIIs, nonirrigated; Blacktop soil—VIIIs, nonirrigated

*Range site:* Rodad soil—029X037N; Penelas soil—029X014N; Blacktop soil—029X033N

## 2110—Bylo Variant very fine sandy loam, 0 to 2 percent slopes

### Map Unit Setting

*Position on landscape:* Mountain-valley alluvial flats  
*Elevation:* 5,200 to 6,300 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 115 days

### Composition

*Major components:*

- Bylo Variant very fine sandy loam, 0 to 2 percent slopes (Typic Camborthids, fine-silty, mixed, mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Playas—5 percent
- Inclusion 2: Fawin gravelly loamy sand, 0 to 4 percent slopes (Typic Camborthids, sandy, mixed, mesic)—5 percent

### Characteristics of the Bylo Variant

*Position on landscape:* Mountain-valley alluvial flats  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Shadscale, bud sagebrush

### Typical Profile

0 to 3 inches—very fine sandy loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4  
 3 to 60 inches—silt loam; platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—May to August  
*Permeability:* Moderately slow  
*Available water capacity:* About 10 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Poned  
*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sink areas  
*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Mountain-valley fan skirts  
*Contrasting features:* Less than 18 percent clay throughout the profile, sandy surface texture, rarely flooded  
*Distinctive present vegetation:* Bud sagebrush, winterfat, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Bylo Variant for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too crusty  
*Shallow excavations:* Moderate—flooding  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Fair—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X020N

## 2120—Itme-Truhoy association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,800 to 6,400 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Itme very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—55 percent
- Truhoy very gravelly fine sandy loam, 2 to 8 percent

slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 2: Stumble loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Itme Soil**

*Position on landscape:* Fan aprons and inset fans

*Parent material:* Kind—alluvium; source—granitic rock and rhyolitic tuff

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny hopsage, Anderson wolfberry, shadscale, Indian ricegrass, galleta

### **Typical Profile**

0 to 6 inches—very gravelly sand; 0 to 5 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SP; estimated AASHTO classification—A-1

6 to 60 inches—very gravelly loamy sand, very gravelly sand; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SP, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Very rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Truhoy Soil**

*Position on landscape:* Nonburied fan piedmont remnants and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 11 inches—gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

11 to 17 inches—strongly cemented duripan

17 to 60 inches—stratified very gravelly loamy sand to extremely gravelly coarse sand; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 9.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderate; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Sand sheets  
*Contrasting features:* Sandy throughout the profile  
*Distinctive present vegetation:* Littleleaf horsebrush,  
 Indian ricegrass, fourwing saltbush

#### **Inclusion 3**

*Position on landscape:* Channels at higher elevations  
*Contrasting features:* Occasionally flooded, higher water-  
 supplying capacity  
*Distinctive present vegetation:* Littleleaf horsebrush,  
 Indian ricegrass, fourwing saltbush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Itme Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Truhoy Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cemented pan, cutbanks  
 cave  
*Local roads and streets:* Moderate—cemented pan  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Itme soil—VII<sub>s</sub>, nonirrigated;  
 Truhoy soil—VII<sub>s</sub>, nonirrigated  
*Range site:* Itme soil—029X016N; Truhoy soil—  
 029X036N

## **3000—Perazzo-Typic Torriorthents association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,100 to 5,800 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Perazzo very gravelly sandy loam, 4 to 15 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—55 percent
  - Typic Torriorthents, very gravelly sandy loam, 15 to 50 percent slopes (Typic Torriorthents)—30 percent
- Contrasting inclusions:*
- Inclusion 1: Perazzo very gravelly sandy loam, 15 to 30 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
  - Inclusion 2: Trocken very gravelly loamy sand, 4 to 8 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
  - Inclusion 3: Bluewing very gravelly sand, frequently flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
  - Inclusion 4: Badland—2 percent

### **Characteristics of the Perazzo Soil**

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants and partial ballenas  
*Parent material:* Mixed alluvium  
*Slope features:* Length—very short; shape—convex  
*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

- 0 to 4 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 4 to 13 inches—very gravelly sandy clay loam, very gravelly clay loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated

Unified classification—GC; estimated AASHTO classification—A-2

13 to 21 inches—extremely gravelly sandy loam, extremely gravelly loam; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

21 to 60 inches—extremely gravelly sand, extremely gravelly loamy sand; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—3; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Typic Torriorthents

*Position on landscape:* Back slopes of fan piedmont remnants and partial ballenas

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood

### Reference Profile

0 to 6 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulder slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 15 percent

#### Inclusion 2

*Position on landscape:* Inset fans

*Contrasting features:* No layer of clay accumulation, rarely flooded

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Frequently flooded, no layer of clay accumulation

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 4

*Position on landscape:* Areas of exposed lacustrine sediments on fan piedmont remnants

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Perazzo Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Typic Torriorthents for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Perazzo soil—IVs, irrigated, and VIIs, nonirrigated; Typic Torriorthents—VIIs, nonirrigated

*Range site:* Perazzo soil—027X018N; Typic Torriorthents—029X033N

### **3001—Perazzo-Rawe-Bluewing association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,700 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

#### **Composition**

*Major components:*

- Perazzo very gravelly sandy loam, 8 to 15 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—45 percent
- Rawe gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, clayey over loamy-skeletal, montmorillonitic, mesic)—25 percent
- Bluewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, gravelly sand, 8 to 15

percent slopes (Typic Torriorthents, sandy, mixed, mesic)—4 percent

- Inclusion 2: Singatse very gravelly sandy loam, 8 to 15 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

- Inclusion 3: Typic Torriorthents, very gravelly sandy loam, 15 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed [calcareous], mesic)—1 percent

- Inclusion 4: Badland—2 percent

#### **Characteristics of the Perazzo Soil**

*Position on landscape:* Higher shoulder slopes and back slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

#### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

4 to 13 inches—very gravelly sandy clay loam, very gravelly clay loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

13 to 21 inches—extremely gravelly sandy loam, extremely gravelly loam; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

21 to 60 inches—extremely gravelly sand, extremely gravelly loamy sand; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.05; T value—3; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Rawe Soil**

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—very short; shape—convex  
*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

**Typical Profile**

0 to 1 inch—gravelly sandy loam; 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 1 to 10 inches—clay, gravelly clay; 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SC, CL; estimated AASHTO classification—A-7  
 10 to 60 inches—stratified very gravelly sandy loam to extremely gravelly coarse sandy loam; 50 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Bluewing Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Bailey greasewood, rubber rabbitbrush, burrobrush, Indian ricegrass

**Typical Profile**

0 to 7 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones, 55 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1  
 7 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief; duration—November to September  
*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sand sheets over back slopes of fan piedmont remnants

*Contrasting features:* Sandy textures throughout the profile

*Distinctive present vegetation:* Littleleaf horsebrush, Indian ricegrass

#### Inclusion 2

*Position on landscape:* Hills

*Contrasting features:* Hard bedrock within a depth of 20 inches

*Distinctive present vegetation:* Sparse shadscale

#### Inclusion 3

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 15 percent, lower water-supplying capacity

*Distinctive present vegetation:* Sparse shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Perazzo Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Rawe Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, rooting depth

*Shallow excavations:* Slight

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Bluewing Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Perazzo soil—IVs, irrigated, and VIIs, nonirrigated; Rawe soil—VIIs, nonirrigated; Bluewing soil—VIIw, nonirrigated

*Range site:* Perazzo soil—027X018N; Rawe soil—027X018N; Bluewing soil—027X022N

## 3002—Perazzo-Veet-Rawe association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 4,900 to 5,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Perazzo very gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—45 percent
  - Veet very gravelly sandy loam, 4 to 15 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—25 percent
  - Rawe gravelly sandy loam, 2 to 4 percent slopes (Typic Haplargids, clayey over loamy-skeletal, montmorillonitic, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Singatse very gravelly sandy loam, 8 to 30 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—8 percent
  - Inclusion 2: Xeric Torriorthents, very gravelly sandy loam, 2 to 4 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
  - Inclusion 3: Rock outcrop—2 percent

### Characteristics of the Perazzo Soil

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

**Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

4 to 13 inches—very gravelly sandy clay loam, very gravelly clay loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

13 to 21 inches—extremely gravelly sandy loam, extremely gravelly loam; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

21 to 60 inches—extremely gravelly sand, extremely gravelly loamy sand; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—3; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Veet Soil**

*Position on landscape:* Side slopes of fan piedmont remnants and inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

**Typical Profile**

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Rawe Soil**

*Position on landscape:* Slightly higher summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### Typical Profile

- 0 to 1 inch—gravelly sandy loam; 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 1 to 10 inches—clay, gravelly clay; 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SC, CL; estimated AASHTO classification—A-7
- 10 to 60 inches—stratified very gravelly sandy loam to extremely gravelly coarse sandy loam; 50 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

- Position on landscape:* Hills  
*Contrasting features:* Hard bedrock within a depth of 20 inches, lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale

#### Inclusion 2

- Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Inclusion 3

- Position on landscape:* Scattered small peaks and ridges

- Contrasting features:* Exposed bedrock  
*Distinctive present vegetation:* None

### Major Uses

- Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Perazzo Soil for Various Uses

- Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor
- Range seeding:* Poor—too arid, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—small stones  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Veet Soil for Various Uses

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, frost action, slope  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Rawe Soil for Various Uses

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, rooting depth  
*Shallow excavations:* Slight  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

- Capability classification:* Perazzo soil—IVs, irrigated, and VIIs, nonirrigated; Veet soil—VIIs, nonirrigated; Rawe soil—VIIs, nonirrigated  
*Range site:* Perazzo soil—027X018N; Veet soil—029X049N; Rawe soil—027X018N

**3003—Perazzo-Bluewing association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 5,700 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Perazzo very gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—50 percent
- Bluewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Deefan very gravelly sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—8 percent
- Inclusion 2: Theon very gravelly sandy loam, 8 to 15 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Hawsley loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent

**Characteristics of the Perazzo Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

**Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

4 to 13 inches—very gravelly sandy clay loam, very gravelly clay loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

13 to 21 inches—extremely gravelly sandy loam,

extremely gravelly loam; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

21 to 60 inches—extremely gravelly sand, extremely gravelly loamy sand; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—3; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Bluewing Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, rubber rabbitbrush, burrobrush

**Typical Profile**

0 to 7 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones, 55 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1

7 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4

mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief; months—November to September  
*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Slightly higher summits of fan piedmont remnants  
*Contrasting features:* Cemented pan within a depth of 20 inches, average of more than 35 percent clay above cemented pan

#### Inclusion 2

*Position on landscape:* Low hills  
*Contrasting features:* Hard bedrock within a depth of 20 inches

#### Inclusion 3

*Position on landscape:* Sand sheets over fan piedmont remnants and channels  
*Contrasting features:* Sandy, nongravelly textures throughout the profile  
*Distinctive present vegetation:* Littleleaf horsebrush, fourwing saltbush, Indian ricegrass

**Other inclusions (in only a few areas):** Typic Torriorthents, sandy, mixed, mesic

*Position on landscape:* Small areas adjacent to Lyon County line

### Major Uses

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Perazzo Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—small stones  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Bluewing Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too sandy, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Perazzo soil—IVs, irrigated, and VIIs, nonirrigated; Bluewing soil—VIIw, nonirrigated  
*Range site:* Perazzo soil—027X018N; Bluewing soil—027X022N

## 3020—Rawe-Bluewing-Trocken association

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,500 to 4,900 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Rawe gravelly sandy loam, 2 to 15 percent slopes (Typic Haplargids, clayey over loamy-skeletal, montmorillonitic, mesic)—55 percent
- Bluewing very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent
- Trocken very gravelly sandy loam, 2 to 15 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Perazzo very gravelly sandy loam, 2 to 8

percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—9 percent

• Inclusion 2: Bluewing very gravelly loamy sand, frequently flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—1 percent

### **Characteristics of the Rawe Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

4 to 11 inches—clay, gravelly clay; 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SC, CL; estimated AASHTO classification—A-7

11 to 60 inches—stratified very gravelly sandy loam to extremely gravelly coarse sandy loam; 50 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Bluewing Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, Indian ricegrass

### **Typical Profile**

0 to 7 inches—very gravelly loamy sand; 5 to 15 percent cobbles and stones, 65 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

7 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 15 to 25 percent cobbles and stones, 65 to 75 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Very rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Trocken Soil**

*Position on landscape:* Higher inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure

parting to platy; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

3 to 60 inches—stratified gravelly loam to extremely gravelly loamy coarse sand; 0 to 15 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of fan aprons and fan piedmont remnants

*Contrasting features:* Layer of clay accumulation with less than 35 percent clay

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Rawe Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, rooting depth

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Bluewing Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Trocken Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Rawe soil—VIIIs, nonirrigated; Bluewing soil—VIIIs, nonirrigated; Trocken soil—VIIIs, nonirrigated

*Range site:* Rawe soil—027X018N; Bluewing soil—027X018N; Trocken soil—027X018N

## 3040—Deefan-Rawe-Bluewing association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 6,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Deefan very gravelly fine sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—45 percent
- Rawe gravelly sandy loam, 4 to 15 percent slopes (Typic Haplargids, clayey over loamy-skeletal, montmorillonitic, mesic)—20 percent
- Bluewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Trocken very gravelly loamy sand, 2 to 4

percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—8 percent

• Inclusion 2: Cleaver very gravelly sandy loam, 2 to 8 percent slopes (Typic Durargids, loamy, mixed, mesic, shallow)—4 percent

• Inclusion 3: Typic Torriorthents, very gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

### **Characteristics of the Deefan Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 10 inches—gravelly clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7

10 to 26 inches—strongly cemented duripan

26 to 60 inches—stratified extremely gravelly coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rawe Soil**

*Position on landscape:* Higher inset fans and fan aprons

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 1 inch—gravelly sandy loam; 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

1 to 10 inches—clay, gravelly clay; 10 to 40 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SC, CL; estimated AASHTO classification—A-7

10 to 60 inches—stratified very gravelly sandy loam to extremely gravelly coarse sandy loam; 50 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Bluewing Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Burrobrush, rabbitbrush, Indian ricegrass

#### **Typical Profile**

0 to 7 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones, 55 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1

7 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—frequent; duration—very brief; months—November to September

*Permeability:* Very rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Inset fans

*Contrasting features:* Occasionally flooded, no layer of clay accumulation

##### **Inclusion 2**

*Position on landscape:* Highest summits of fan piedmont remnants

*Contrasting features:* Indurated pan within a depth of 20 inches

*Distinctive present vegetation:* Sparse shadscale

##### **Inclusion 3**

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent, no layer of clay accumulation

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Deefan Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Rawe Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, rooting depth

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Bluewing Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Deefan soil—VII<sub>s</sub>, nonirrigated; Rawe soil—VII<sub>s</sub>, nonirrigated; Bluewing soil—VII<sub>w</sub>, nonirrigated

*Range site:* Deefan soil—027X018N; Rawe soil—027X018N; Bluewing soil—027X022N

**3042—Deefan-Perazzo association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,900 to 5,300 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Deefan very gravelly fine sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—55 percent

- Perazzo very gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Bluewing very gravelly sand, frequently flooded, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—8 percent

- Inclusion 2: Theon very gravelly sandy loam, 8 to 15 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Cleaver very gravelly sandy loam, 2 to 8 percent slopes (Typic Durargids, loamy, mixed, mesic, shallow)—3 percent

**Characteristics of the Deefan Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

**Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 10 inches—gravelly clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7

10 to 26 inches—strongly cemented duripan

26 to 60 inches—stratified extremely gravelly coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Perazzo Soil**

*Position on landscape:* Fan aprons

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

**Typical Profile**

0 to 6 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 15 inches—very gravelly sandy clay loam, very gravelly clay loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

15 to 20 inches—extremely gravelly sandy loam, extremely gravelly loam; 0 to 5 percent cobbles and

stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

20 to 60 inches—extremely gravelly sand, extremely gravelly loamy sand; 0 to 5 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—3; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels

*Contrasting features:* Frequently flooded, no layer of clay accumulation

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 2

*Position on landscape:* Low hills

*Contrasting features:* Bedrock within a depth of 20 inches

#### Inclusion 3

*Position on landscape:* Highest summits of fan piedmont remnants

*Contrasting features:* Indurated pan within a depth of 20 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Deefan Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Perazzo Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Deefan soil—VIIs, nonirrigated; Perazzo soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Deefan soil—027X018N; Perazzo soil—027X018N

## 3043—Deefan-Cleaver-Bluewing association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 6,200 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Deefan very gravelly fine sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—50 percent
- Cleaver very gravelly sandy loam, 4 to 15 percent slopes (Typic Durargids, loamy, mixed, mesic, shallow)—20 percent

- Bluewing very gravelly loamy sand, frequently flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Trocken very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
- Inclusion 2: Typic Torriorthents, very gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
- Inclusion 3: Typic Haplargids, gravelly loamy sand, 2 to 4 percent slopes (Typic Haplargids, coarse-loamy, mixed, mesic)—5 percent

### **Characteristics of the Deefan Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

*Percent of surface covered by rock fragments:* 45 percent pebbles, 5 percent cobbles

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 10 inches—gravelly clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC, CL, CH; estimated AASHTO classification—A-7

10 to 26 inches—strongly cemented duripan

26 to 60 inches—stratified extremely gravelly coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 75 to 85 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Cleaver Soil**

*Position on landscape:* Slightly higher summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—basic igneous rocks

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 60 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly clay loam, gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SC, CL; estimated AASHTO classification—A-6, A-7

11 to 23 inches—indurated duripan

23 to 60 inches—stratified extremely gravelly coarse sand to very gravelly sandy loam; 10 to 25 percent cobbles and stones, 75 to 90 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 1 to 2 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Bluewing Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Burrobrush, rabbitbrush, Indian ricegrass

### **Typical Profile**

0 to 7 inches—very gravelly loamy sand; 10 to 25 percent cobbles and stones, 55 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP-SM; estimated AASHTO classification—A-1  
 7 to 60 inches—stratified very gravelly sand to extremely gravelly loamy coarse sand; 0 to 25 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—frequent; duration—very brief, months—November to September  
*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans  
*Contrasting features:* Rarely flooded, no horizon of silica cementation

#### **Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants  
*Contrasting features:* Slopes of more than 8 percent, no cemented pan, nonflooded

#### **Inclusion 3**

*Position on landscape:* Higher inset fans with thin sand sheets  
*Contrasting features:* No cemented pan, sandy surface, rarely flooded  
*Distinctive present vegetation:* Indian ricegrass, Nevada dalea

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Deefan Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cemented pan, cutbanks cave  
*Local roads and streets:* Moderate—cemented pan  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Cleaver Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cemented pan, cutbanks cave  
*Local roads and streets:* Severe—cemented pan  
*Roadfill:* Poor—cemented pan  
*Sand:* Improbable source—small stones  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Bluewing Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fans

*Contrasting features:* Less than 15 percent rock fragments throughout the profile, more carbonates throughout the profile

*Distinctive present vegetation:* Winterfat, Indian ricegrass, galleta

#### Inclusion 2

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Layer of clay accumulation, soft bedrock within a depth of 20 inches

#### Inclusion 3

*Position on landscape:* Back slopes and shoulder slopes of hills

*Contrasting features:* Soft bedrock within a depth of 5 inches

*Distinctive present vegetation:* Utah juniper, black sagebrush, Wyoming big sagebrush, purple sage

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Veet Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X049N

## 3060—Smedley-Silverbow-Annaw association

### Map Unit Setting

*Position on landscape:* Fan piedmonts and pediments

*Elevation:* 5,200 to 5,800 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Smedley very gravelly sandy loam, 8 to 15 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—45 percent
- Silverbow very cobbly fine sandy loam, 8 to 15 percent slopes (Typic Durargids, loamy-skeletal, mixed, mesic, shallow)—25 percent
- Annaw very gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent
- Inclusion 2: Veet very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Smedley Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

#### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

2 to 18 inches—gravelly clay loam, gravelly clay, cobbly clay loam; 5 to 15 percent cobbles and stones, 20 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7

18 to 43 inches—strongly cemented duripan

43 to 60 inches—stratified extremely gravelly sand to extremely gravelly sandy loam; 15 to 30 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Silverbow Soil**

*Position on landscape:* Foot slopes of hills and pediments

*Parent material:* Kind—alluvium and colluvium; source—basic igneous rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta

#### **Typical Profile**

0 to 3 inches—very cobbly fine sandy loam; 25 to 55 percent cobbles and stones, 35 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-2, A-4

3 to 14 inches—very stony clay loam, very cobbly clay loam, extremely cobbly sandy clay loam; 35 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 7.9); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

14 to 42 inches—indurated duripan

42 to 60 inches—strongly cemented duripan

#### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Annaw Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta

**Typical Profile**

- 0 to 2 inches—very gravelly loamy sand; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1
- 2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches
- Depth to seasonal high water table:* More than 60 inches
- Frequency of flooding:* Rare
- Permeability:* Moderately rapid
- Available water capacity:* About 3 inches
- Water-supplying capacity:* About 6 inches
- Runoff:* Slow
- Hydrologic group:* B
- Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4
- Hazard of erosion:* By water—slight; by wind—slight
- Shrink-swell potential:* Low
- Corrosivity:* Steel—high; concrete—low
- Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Channels
- Contrasting features:* Frequently flooded
- Distinctive present vegetation:* Burrobrush, rabbitbrush

**Inclusion 2**

- Position on landscape:* Inset fans at higher elevations
- Contrasting features:* Higher water-supplying capacity
- Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Smedley Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
- Range seeding:* Poor—too arid, small stones
- Shallow excavations:* Severe—cemented pan
- Local roads and streets:* Severe—cemented pan, low strength
- Roadfill:* Poor—cemented pan
- Sand:* Probable source
- Gravel:* Probable source
- Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Silverbow Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
- Range seeding:* Poor—too arid, droughty, large stones
- Shallow excavations:* Severe—cemented pan
- Local roads and streets:* Severe—cemented pan
- Roadfill:* Poor—cemented pan
- Sand:* Improbable source—excess fines
- Gravel:* Improbable source—excess fines
- Embankments, dikes, and levees:* Severe—large stones

**Ratings of the Annaw Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor
- Range seeding:* Poor—too arid, soil blowing, droughty
- Shallow excavations:* Severe—cutbanks cave
- Local roads and streets:* Moderate—flooding
- Roadfill:* Good
- Sand:* Probable source
- Gravel:* Probable source
- Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

- Capability classification:* Smedley soil—VII<sub>s</sub>, nonirrigated; Silverbow soil—VII<sub>s</sub>, nonirrigated; Annaw soil—VII<sub>s</sub>, nonirrigated
- Range site:* Smedley soil—027X015N; Silverbow soil—029X017N; Annaw soil—029X017N

**3061—Smedley-Annaw-Izo association****Map Unit Setting**

- Position on landscape:* Fan piedmonts
- Elevation:* 5,100 to 6,200 feet
- Average annual precipitation:* About 6 inches
- Average annual air temperature:* About 53 degrees F
- Frost-free season:* About 130 days

### Composition

#### Major components:

- Smedley very gravelly sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—50 percent
- Annaw very gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—25 percent
- Izo gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

#### Contrasting inclusions:

- Inclusion 1: Silverbow very cobbly sandy loam, 8 to 15 percent slopes (Typic Durargids, loamy-skeletal, mixed, mesic, shallow)—6 percent
- Inclusion 2: Veet very gravelly sandy loam, 8 to 15 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—4 percent

### Characteristics of the Smedley Soil

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### Typical Profile

- 0 to 2 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1
- 2 to 15 inches—gravelly clay loam, gravelly clay, cobbly clay loam; 5 to 15 percent cobbles and stones, 20 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7
- 15 to 33 inches—strongly cemented duripan
- 33 to 60 inches—stratified extremely gravelly sand to extremely gravelly sandy loam; 15 to 30 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Annaw Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass, galleta

### Typical Profile

- 0 to 2 inches—very gravelly loamy sand; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1
- 2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Characteristics of the Izo Soil**

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Rabbitbrush, Bailey greasewood, shadscale, burrobrush

**Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Pediments and foot slopes of hills  
*Contrasting features:* Average of less than 35 percent clay, layer of clay accumulation

**Inclusion 2**

*Position on landscape:* Inset fans at higher elevations  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Smedley Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, small stones  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, low strength  
*Roadfill:* Poor—cemented pan  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Annaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, soil blowing, droughty  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Smedley soil—VIIIs, nonirrigated; Annaw soil—VIIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Smedley soil—027X015N; Annaw soil—029X017N; Izo soil—029X041N

### 3063—Smedley very gravelly sandy loam, 4 to 30 percent slopes

#### Map Unit Setting

*Position on landscape:* Fan piedmonts and ballenas

*Elevation:* 5,400 to 6,400 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

#### Composition

*Major components:*

- Smedley very gravelly sandy loam, 4 to 30 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Annaw very gravelly sandy loam, 4 to 15 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—3 percent

#### Characteristics of the Smedley Soil

*Position on landscape:* Summits of fan piedmont remnants and ballenas

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

#### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

2 to 18 inches—gravelly clay loam, gravelly clay, cobbly clay loam; 5 to 15 percent cobbles and stones, 20 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7

18 to 43 inches—strongly cemented duripan  
43 to 60 inches—stratified extremely gravelly sand to extremely gravelly sandy loam; 15 to 30 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Channels

*Contrasting features:* No cemented pan throughout the profile, occasionally flooded, sandy textures throughout the profile

*Distinctive present vegetation:* Rabbitbrush, burrobrush

##### Inclusion 2

*Position on landscape:* Inset fans and side slopes of lower fan piedmont remnants

*Contrasting features:* Rarely flooded, no cemented pan throughout the profile

##### Other inclusions (in only a few areas)

- Roic very gravelly fine sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—areas adjacent to badland
- Haplic Durargids, loamy, mixed, mesic, shallow—small areas adjacent to Lyon County line

#### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Smedley Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cemented pan, slope

*Local roads and streets:* Severe—cemented pan, low strength, slope

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* VIIe, nonirrigated

*Range site:* 027X015N

**3070—Silverbow-Rubble land-Smedley association****Map Unit Setting**

*Position on landscape:* Hills

*Elevation:* 5,400 to 6,700 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

**Composition**

*Major components:*

- Silverbow extremely stony very fine sandy loam, 8 to 30 percent slopes (Typic Durargids, loamy-skeletal, mixed, mesic, shallow)—55 percent

- Rubble land—15 percent

- Smedley stony sandy loam, 4 to 15 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Loomer very stony sandy loam, 30 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic)—6 percent

- Inclusion 2: Rowel very stony sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Xerollic Durargids, stony sandy loam, 30 to 75 percent slopes (Xerollic Durargids, loamy-skeletal, mixed, mesic, shallow)—4 percent

**Characteristics of the Silverbow Soil**

*Position on landscape:* Back slopes and foot slopes of hills

*Parent material:* Kind—alluvium and colluvium; source—basic igneous rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta

*Percent of surface covered by rock fragments:* 15 percent stones

**Typical Profile**

0 to 2 inches—extremely stony very fine sandy loam; 25 to 45 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 13 inches—very stony clay loam, very cobbly clay loam, extremely cobbly sandy clay loam; 30 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 7.9); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

13 to 16 inches—indurated duripan

16 to 40 inches—strongly cemented duripan

**Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Rubble Land**

*Position on landscape:* Areas covered with cobbles, stones, and boulders on back slopes of hills

*Dominant present vegetation:* None

**Characteristics of the Smedley Soil**

*Position on landscape:* Toe slopes of hills and fanettes

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta  
*Percent of surface covered by rock fragments:* 3 percent stones

### Typical Profile

0 to 2 inches—stony sandy loam; 10 to 25 percent cobbles and stones, 25 to 40 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 2 to 18 inches—gravelly clay loam, gravelly clay, cobbly clay loam; 5 to 15 percent cobbles and stones, 20 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7  
 18 to 43 inches—strongly cemented duripan  
 43 to 60 inches—stratified extremely gravelly sand to extremely gravelly sandy loam; 15 to 30 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing back slopes of hills  
*Contrasting features:* Hard bedrock at a depth of 20

inches, higher water-supplying capacity  
*Distinctive present vegetation:* Low sagebrush, Sandberg bluegrass

#### Inclusion 2

*Position on landscape:* Back slopes of hills at higher elevations

*Contrasting features:* Hard bedrock at a depth of 20 inches, higher water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, galleta

#### Inclusion 3

*Position on landscape:* North-facing back slopes of low hills

*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Silverbow Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, large stones  
*Shallow excavations:* Severe—cemented pan, slope  
*Local roads and streets:* Severe—cemented pan, slope  
*Roadfill:* Poor—cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones

#### Ratings of the Smedley Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, large stones  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, low strength  
*Roadfill:* Poor—cemented pan  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Silverbow soil—VIIIs, nonirrigated; Rubble land—VIIIIs; Smedley soil—VIIIs, nonirrigated  
*Range site:* Silverbow soil—029X017N; Smedley soil—027X015N

### 3090—Inmo-Inmo, occasionally flooded, association

#### Map Unit Setting

*Position on landscape:* Alluvial fans

*Elevation:* 4,100 to 5,200 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Inmo very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—70 percent

- Inmo very gravelly loamy sand, occasionally flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Haplargids, gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Inmo very stony loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Rarely Flooded Inmo Soil**

*Position on landscape:* Inset fans and summits of alluvial fan remnants

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 8 inches—very gravelly loamy sand; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

8 to 40 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1

40 to 60 inches—very gravelly loamy coarse sand; 0 to 5 percent cobbles and stones, 45 to 60 percent pebbles (by weight); massive; soft, very friable; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Very rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Occasionally Flooded Inmo Soil**

*Position on landscape:* Channels

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, rabbitbrush, burrobrush

### **Typical Profile**

0 to 8 inches—very gravelly loamy sand; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

8 to 40 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1

40 to 60 inches—very gravelly loamy coarse sand; 0 to 5 percent cobbles and stones, 45 to 60 percent pebbles (by weight); massive; soft, very friable; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—November to August

*Permeability:* Very rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Summits of alluvial fan remnants at higher elevations

*Contrasting features:* Layer of clay accumulation

#### **Inclusion 2**

*Position on landscape:* Fan collars and fan aprons

*Contrasting features:* 3 to 15 percent stones on the surface

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Rarely Flooded Inmo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Occasionally Flooded Inmo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Rarely flooded Inmo soil—VII<sub>s</sub>, nonirrigated; occasionally flooded Inmo soil—VII<sub>w</sub>, nonirrigated

*Range site:* Rarely flooded Inmo soil—027X018N; occasionally flooded Inmo soil—029X041N

## **3091—Inmo-Rednik association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 3,900 to 4,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Inmo extremely stony sandy loam, occasionally flooded, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—70 percent

- Rednik very gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Annaw stony loamy sand, 2 to 8 percent slopes (Typic Camborthids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Typic Torriorthents, very gravelly sandy loam, 15 to 30 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—3 percent

- Inclusion 3: Typic Torriorthents, very gravelly loamy sand, 2 to 15 percent slopes (Typic Torriorthents, sandy or sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Inmo Soil**

*Position on landscape:* Channels and inset fans

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Fourwing saltbush, Douglas rabbitbrush, desert needlegrass

*Percent of surface covered by rock fragments:* 15 percent stones

### **Typical Profile**

0 to 2 inches—extremely stony sandy loam; 30 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 37 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by

weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1

37 to 60 inches—very gravelly loamy coarse sand; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—November to August

*Permeability:* Very rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Rednik Soil

*Position on landscape:* Summits of fan piedmont remnants at higher elevations

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Indian ricegrass, bud sagebrush

### Typical Profile

0 to 6 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 20 inches—extremely gravelly loam, very gravelly sandy loam, very gravelly sandy clay loam; 5 to 40 percent cobbles and stones, 50 to 70 percent pebbles (by weight); angular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified

classification—GC; estimated AASHTO classification—A-2

20 to 45 inches—very gravelly sandy loam, very gravelly fine sandy loam; 5 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

45 to 60 inches—very gravelly sand, extremely gravelly loamy sand; 5 to 30 percent cobbles and stones, 40 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.4); nonsodic (SAR less than 13); estimated Unified classification—GP, GP-GM, SP-SM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Summits of fan piedmont remnants at lower elevations

*Contrasting features:* No horizon of clay accumulation, rarely flooded

#### Inclusion 2

*Position on landscape:* Side slopes of hills and mountains and lake-plain terraces

*Contrasting features:* Depth to bedrock less than 20 inches, slopes of more than 15 percent

*Distinctive present vegetation:* Anderson wolfberry, desert needlegrass

#### Inclusion 3

*Position on landscape:* Beaches

*Contrasting features:* No horizon of clay accumulation, nonflooded, 0 to 90 percent rock fragments throughout the profile

*Distinctive present vegetation:* Desert needlegrass, Nevada ephedra, littleleaf horsebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Inmo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, large stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Rednik Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Inmo soil—VII<sub>s</sub>, nonirrigated; Rednik soil—VII<sub>s</sub>, nonirrigated

*Range site:* Inmo soil—029X041N; Rednik soil—027X018N

## **3092—Inmo-Nuahs-Luning association**

### **Map Unit Setting**

*Position on landscape:* Fan skirts

*Elevation:* 4,400 to 5,000 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 140 days

### **Composition**

*Major components:*

- Inmo sand, overblown, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—40 percent
- Nuahs gravelly loamy sand, 2 to 8 percent slopes (Typic Calciorthids, coarse-loamy, mixed, mesic)—30 percent

- Luning gravelly loamy sand, gravelly substratum, 2 to 8 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Sundown loamy fine sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—5 percent
- Inclusion 2: Typic Camborthids, gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, loamy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Nuahs sand, overblown, 2 to 8 percent slopes (Typic Calciorthids, coarse-loamy, mixed, mesic)—3 percent
- Inclusion 4: Typic Torriorthents, gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Inmo Soil**

*Position on landscape:* Upper parts of fan skirts and channels with thin sand sheets

*Parent material:* Mixed alluvium with a cap of sandy eolian material

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, Bailey greasewood, fourwing saltbush

### **Typical Profile**

0 to 6 inches—sand; 0 to 20 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

6 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Very rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Nuahs Soil**

*Position on landscape:* Lower parts of fan skirts

*Parent material:* Kind—mixed alluvium; source—dominantly granite and rhyolite

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Cooper wolfberry, Bailey greasewood, shadscale, Indian ricegrass

### **Typical Profile**

0 to 4 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 8); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 18 inches—sandy loam, coarse sandy loam; 0 to 10 percent cobbles and stones, 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-2

18 to 60 inches—stratified fine sandy loam to very gravelly loamy coarse sand; 0 to 15 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); slightly saline to moderately saline (4 to 16 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### **Characteristics of the Luning Soil**

*Position on landscape:* Fan skirts with sand sheets at slightly higher elevations

*Parent material:* Mixed alluvium with a cap of sandy eolian material

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, Bailey greasewood, fourwing saltbush

### **Typical Profile**

0 to 6 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 30 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

6 to 35 inches—loamy fine sand, fine sand; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

35 to 60 inches—stratified very gravelly sand to gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 55 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, SP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sand sheets over old channels  
*Contrasting features:* Sandy throughout the profile, less than 15 percent rock fragments throughout the profile

#### Inclusion 2

*Position on landscape:* Slightly higher fan skirts at higher elevations  
*Contrasting features:* More than 35 percent rock fragments between the depths of 2 and 60 inches, sandy loam textures

#### Inclusion 3

*Position on landscape:* Slightly lower fan skirts at lower elevations  
*Contrasting features:* Sandy surface texture, layer of lime accumulation at a depth of 4 to 12 inches

#### Inclusion 4

*Position on landscape:* Lower parts of fan skirts  
*Contrasting features:* More than 35 percent rock fragments between the depths of 2 and 60 inches  
*Distinctive present vegetation:* Cooper wolfberry, shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### Ratings of the Inmo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Nuahs Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, too sandy, excess sodium  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### Ratings of the Luning Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, piping

### Interpretive Groups

*Capability classification:* Inmo soil—VIIs, nonirrigated; Nuahs soil—IVe, irrigated, and VIIs, nonirrigated; Luning soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Inmo soil—027X060N; Nuahs soil—027X043N; Luning soil—027X060N

## 3095—Inmo-Stumble association

### Map Unit Setting

*Position on landscape:* Alluvial fans  
*Elevation:* 4,900 to 5,300 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Inmo very gravelly loamy sand, occasionally flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—70 percent
- Stumble loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Inmo very bouldery loamy coarse sand, occasionally flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

### Characteristics of the Inmo Soil

*Position on landscape:* Alluvial fans  
*Parent material:* Kind—alluvium; source—granitic rock  
*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, rabbitbrush, Indian ricegrass, burrobrush

### Typical Profile

0 to 8 inches—very gravelly loamy sand; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

8 to 40 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SP, SP-SM; estimated AASHTO classification—A-1

40 to 60 inches—very gravelly loamy coarse sand; 0 to 5 percent cobbles and stones, 45 to 60 percent pebbles (by weight); massive; soft, very friable; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—November to August

*Permeability:* Very rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Stumble Soil

*Position on landscape:* Sand sheets over alluvial fans

*Parent material:* Kind—eolian material and alluvium; source—various kinds of rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Dalea, littleleaf horsebrush, fourwing saltbush, Indian ricegrass

### Typical Profile

0 to 12 inches—loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; mildly alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

12 to 18 inches—loamy fine sand, loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

18 to 60 inches—gravelly loamy sand, gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 30 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels

*Contrasting features:* 3 to 15 percent boulders on the surface

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Inmo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Stumble Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Inmo soil—VIIw, nonirrigated; Stumble soil—VIIs, nonirrigated  
*Range site:* Inmo soil—029X041N; Stumble soil—027X009N

### **3110—Fulstone-Wedlar-Veet association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and partial ballenas  
*Elevation:* 6,000 to 6,600 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 48 degrees F  
*Frost-free season:* About 120 days

#### **Composition**

*Major components:*

- Fulstone cobbly loam, 2 to 4 percent slopes (Abruptic Xerollic Durargids, clayey, montmorillonitic, mesic, shallow)—50 percent
- Wedlar loamy sand, 4 to 15 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—20 percent
- Veet very gravelly sandy loam, 4 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Mickey very gravelly sandy loam, 2 to 8 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—7 percent
- Inclusion 2: Haar gravelly loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—5 percent

- Inclusion 3: Xeric Torriorthents, sand, occasionally flooded, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

#### **Characteristics of the Fulstone Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, bottlebrush squirreltail, Nevada ephedra, Sandberg bluegrass

#### **Typical Profile**

- 0 to 5 inches—cobbly loam; 15 to 30 percent cobbles and stones, 25 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4
- 5 to 18 inches—clay; 0 to 5 percent cobbles and stones, 0 to 10 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7
- 18 to 30 inches—indurated duripan
- 30 to 60 inches—very cobbly sandy loam, extremely cobbly sandy loam, extremely gravelly sand; 30 to 45 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM, GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

- Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Wedlar Soil**

*Position on landscape:* Side slopes of partial ballenas and side slopes of fan piedmont remnants

*Parent material:* Kind—alluvium; source—predominantly granitic alluvium with some welded rhyolitic tuff

*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush

### **Typical Profile**

0 to 6 inches—loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 14 inches—loam; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

14 to 37 inches—sandy clay loam, sandy clay; 0 to 5 percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6, A-7

37 to 60 inches—gravelly sandy loam, gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Veet Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Summits of fan piedmont remnants at lower elevations

*Contrasting features:* Less than 35 percent clay above cemented pan, duripan within a depth of 20 inches

*Distinctive present vegetation:* Low sagebrush, galleta

#### **Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants over exposed hills

*Contrasting features:* Soft bedrock within a depth of 20 inches, lower water-supplying capacity

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Sandy throughout the profile, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Fulstone Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, rooting depth

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Wedlar Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—droughty, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Fulstone soil—VIIs, nonirrigated; Wedlar soil—IVe, irrigated, and VIi, nonirrigated; Veet soil—VIIi, nonirrigated

*Range site:* Fulstone soil—026X025N; Wedlar soil—029X006N; Veet soil—029X049N

## **3111—Fulstone-Mickey association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and ballenas

*Elevation:* 6,800 to 7,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Fulstone cobbly loam, 2 to 8 percent slopes (Abruptic Xerollic Durargids, clayey, montmorillonitic, mesic, shallow)—55 percent

- Mickey gravelly loamy sand, 4 to 15 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Veet very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Wassit very stony sandy loam, 30 to 50 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—3 percent

### **Characteristics of the Fulstone Soil**

*Position on landscape:* Summits of higher fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, bottlebrush squirreltail, Nevada ephedra, Sandberg bluegrass

### Typical Profile

- 0 to 4 inches—cobbly loam; 15 to 30 percent cobbles and stones, 25 to 35 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, SM-SC; estimated AASHTO classification—A-4
- 4 to 15 inches—clay; 0 to 5 percent cobbles and stones, 0 to 10 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7
- 15 to 40 inches—indurated duripan
- 40 to 60 inches—very cobbly sandy loam, extremely cobbly sandy loam, extremely gravelly sand; 30 to 45 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Mickey Soil

*Position on landscape:* Side slopes of fan piedmont remnants and higher inset fan remnants  
*Parent material:* Kind—alluvium; source—granitic rock  
*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, Nevada ephedra, galleta

### Typical Profile

- 0 to 5 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 5 to 10 inches—gravelly sandy clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
- 10 to 15 inches—gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6, A-7
- 15 to 37 inches—strongly cemented duripan
- 37 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels

*Contrasting features:* No cemented pan throughout the profile, more than 35 percent rock fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* No cemented pan throughout the profile, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Side slopes of hills (mostly north aspects of higher elevations)

*Contrasting features:* Hard bedrock within a depth of 20 inches, higher water-supplying capacity, slopes of more than 30 percent

*Distinctive present vegetation:* Singleleaf pinyon, mountain big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Fulstone Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, rooting depth

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Mickey Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, slope, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Fulstone soil—VIIs,

nonirrigated; Mickey soil—VIIs, nonirrigated  
*Range site:* Fulstone soil—026X025N; Mickey soil—027X049N

## **3120—Wassit-Brawley association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 8,400 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 95 days

### **Composition**

*Major components:*

- Wassit very gravelly sandy loam, 15 to 50 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—50 percent
- Brawley very stony fine sandy loam, 15 to 50 percent slopes (Mollic Palexeralfs, clayey-skeletal, montmorillonitic, frigid)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Haploxeralfs, very gravelly sandy loam, 50 to 75 percent slopes (Typic Haploxeralfs, loamy-skeletal, mixed, frigid)—7 percent
- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Beelem very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—3 percent
- Inclusion 4: Xerollic Haplargids, very gravelly sandy loam, 8 to 30 percent slopes (Xerollic Haplargids, clayey-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Wassit Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, pine bluegrass

### **Typical Profile**

0 to 6 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

6 to 12 inches—very gravelly loam, very gravelly clay

loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

12 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Brawley Soil

*Position on landscape:* Back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered volcanic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, low sagebrush, pine bluegrass

*Percent of surface covered by rock fragments:* 20 percent pebbles, 10 percent cobbles, 5 percent stones

### Typical Profile

0 to 7 inches—very stony fine sandy loam; 15 to 30 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4  
7 to 27 inches—very gravelly clay, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); angular blocky structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC,

GM; estimated AASHTO classification—A-2  
27 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Water-supplying capacity:* About 3 inches

*Available water capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Back slopes of mountains

*Contrasting features:* Slopes of more than 50 percent, bedrock at a depth of more than 40 inches

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Eroded south-facing back slopes of mountains at lower elevations

*Contrasting features:* No layer of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### Inclusion 4

*Position on landscape:* Crests and shoulder slopes of mountains

*Contrasting features:* Hard bedrock at a depth of more than 40 inches, lower water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, Sandberg bluegrass

#### Other inclusions (in only a few areas):

Typic Torriorthents, 30 to 75 percent slopes (hills at the mouth of Powell Canyon)

*Position on landscape:* South-facing back slopes of hills

*Contrasting features:* Lower water-supplying capacity, no layer of clay accumulation

*Distinctive present vegetation:* Spiny menodora, galleta, desert needlegrass

### Major Uses

**Current uses:** Wildlife habitat, woodland

#### Woodland

*Site index for singleleaf pinyon:* 39

*Most important native understory plants:* Wassit—mountain big sagebrush, pine bluegrass; Brawley—mountain big sagebrush, low sagebrush, pine bluegrass

#### Ratings of the Wassit Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Brawley Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—small stones, rooting depth

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Wassit soil—VII<sub>s</sub>, nonirrigated; Brawley soil—VII<sub>s</sub>, nonirrigated

*Woodland suitability group:* Wassit soil—1R; Brawley soil—1R

## 3123—Wassit very stony loam, 15 to 50 percent slopes

### Map Unit Setting

*Position on landscape:* Hills and mountains

*Elevation:* 6,000 to 8,400 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 43 degrees F

*Frost-free season:* About 90 days

### Composition

*Major components:*

- Wassit very stony sandy loam, 15 to 50 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—4 percent
- Inclusion 2: Hiridge very gravelly sandy loam, 4 to 15 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—3 percent
- Inclusion 3: Xerollic Camborthids, loamy fine sand, 2 to 4 percent slopes (Xerollic Camborthids, sandy, mixed, frigid)—3 percent

### Characteristics of the Wassit Soil

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, pine bluegrass

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 6 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

6 to 12 inches—very gravelly loam, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

12 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Crests of mountains at higher elevations

*Contrasting features:* Lower water-supplying capacity, thicker dark surface layer

*Distinctive present vegetation:* Low sagebrush, Sandberg bluegrass

#### **Inclusion 3**

*Position on landscape:* Intramontane basins

*Contrasting features:* Bedrock at a depth of more than 20 inches, slopes of less than 4 percent, less than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Wildlife habitat, woodland

#### **Woodland**

*Site index for common trees:* Singleleaf pinyon—39

*Most important native understory plants:* Mountain big sagebrush

#### **Ratings of the Wassit Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Woodland suitability group:* 1R

## **3124—Wassit-Loomer association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,800 to 8,800 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

- Wassit very gravelly sandy loam, 15 to 50 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—60 percent

- Loomer very gravelly sandy loam, 8 to 30 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Beelem very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—7 percent

- Inclusion 2: Hiridge very gravelly sandy loam, 8 to 30 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—3 percent

### **Characteristics of the Wassit Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, pine bluegrass

### **Typical Profile**

0 to 6 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

6 to 12 inches—very gravelly loam, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

12 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Loomer Soil

*Position on landscape:* Shoulder slopes and back slopes of mountains  
*Parent material:* Kind—residuum; source—andesite  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Low sagebrush, pine bluegrass, Thurber needlegrass

### Typical Profile

0 to 7 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 7 to 17 inches—extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam; 30 to 55 percent cobbles and stones, 65 to 80 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 17 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Eroded back slopes of mountains  
*Contrasting features:* No layer of clay accumulation, slopes of more than 50 percent  
*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Crests and shoulder slopes of mountains at higher elevations  
*Contrasting features:* Soft bedrock within a depth of 20 inches, colder soil temperature  
*Distinctive present vegetation:* Low sagebrush, prairie junegrass, Sandberg bluegrass, Letterman needlegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

#### Woodland

*Site index for singleleaf pinyon:* Wassit—39  
*Most important native understory plants:* Wassit—mountain big sagebrush, pine bluegrass

#### Ratings of the Wassit Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Loomer Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, large stones, slope  
*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones  
*Sand:* Improbable source—excess fines, large stones  
*Gravel:* Improbable source—excess fines, large stones  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

### **Interpretive Groups**

*Capability classification:* Wassit soil—VIIs, nonirrigated;  
 Loomer soil—VIIs, nonirrigated  
*Range site:* Loomer soil—027X020N  
*Woodland suitability group:* Wassit soil—1R

## **3130—Mickey-Smedley-Veet association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 6,000 to 6,600 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Mickey very gravelly sandy loam, 4 to 15 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—35 percent
  - Smedley very gravelly sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—35 percent
  - Veet very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Xeric Torriorthents, very gravelly sandy loam, 2 to 4 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—6 percent
  - Inclusion 2: Annaw very gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—4 percent
  - Inclusion 3: Rowel very cobbly sandy loam, 8 to 15 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
  - Inclusion 4: Mickey very gravelly sandy loam, 15 to 30 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—2 percent

### **Characteristics of the Mickey Soil**

*Position on landscape:* Summits of slightly higher fan piedmont remnants and higher inset fan remnants  
*Parent material:* Kind—alluvium; source—granitic rock  
*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, Nevada ephedra, galleta

### **Typical Profile**

- 0 to 5 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1
- 5 to 10 inches—gravelly sandy clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
- 10 to 15 inches—gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6, A-7
- 15 to 37 inches—strongly cemented duripan
- 37 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Smedley Soil**

*Position on landscape:* Summits of slightly lower fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

2 to 18 inches—gravelly clay loam, gravelly clay, cobbly clay loam; 5 to 15 percent cobbles and stones, 20 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7

18 to 43 inches—strongly cemented duripan

43 to 60 inches—stratified extremely gravelly sand to extremely gravelly sandy loam; 15 to 30 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Veet Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Remnants of inset fans

*Contrasting features:* Rarely flooded, lower water-supplying capacity

#### **Inclusion 3**

*Position on landscape:* Side slopes of hills and mountains

*Contrasting features:* Hard bedrock within a depth of 20 inches

#### **Inclusion 4**

*Position on landscape:* Side slopes of fan remnants

*Contrasting features:* Slopes of more than 15 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Mickey Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, slope, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Smedley Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan, low strength

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Mickey soil—VIIs, nonirrigated; Smedley soil—VIIs, nonirrigated; Veet soil—VIIs, nonirrigated

*Range site:* Mickey soil—027X049N; Smedley soil—027X015N; Veet soil—029X049N

## **3131—Mickey-Veet association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 7,400 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Mickey gravelly loamy sand, 2 to 8 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—70 percent

- Veet very gravelly sandy loam, 4 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Smedley very gravelly sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—8 percent

- Inclusion 2: Xeric Torriorthents, very gravelly sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Ravenell very gravelly sandy loam, 8 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—3 percent

### **Characteristics of the Mickey Soil**

*Position on landscape:* Summits of fan piedmont remnants and higher inset fan remnants

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, Nevada ephedra, galleta

### **Typical Profile**

0 to 5 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 10 inches—gravelly sandy clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6

10 to 15 inches—gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6, A-7

15 to 37 inches—strongly cemented duripan

37 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### Characteristics of the Veet Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

#### Typical Profile

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Summits of fan piedmont remnants at lower elevations

*Contrasting features:* More than 35 percent clay throughout the profile, lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, Bailey greasewood, galleta

##### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Inclusion 3**

*Position on landscape:* Eroded side slopes of fan piedmonts over hills

*Contrasting features:* Soft bedrock within a depth of 14 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Mickey Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, slope, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Mickey soil—VIIs, nonirrigated; Veet soil—VIIs, nonirrigated

*Range site:* Mickey soil—027X049N; Veet soil—029X049N

## **3133—Mickey very gravelly sandy loam, 4 to 30 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and ballenas

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Mickey very gravelly sandy loam, 4 to 30 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Smedley very gravelly sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—5 percent
- Inclusion 3: Durixerollic Haplargids, very gravelly sandy loam, 8 to 30 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—3 percent
- Inclusion 4: Rowel very stony sandy loam, 8 to 15 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Mickey Soil**

*Position on landscape:* Ballenas and side slopes of fan piedmont remnants

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, Nevada ephedra, galleta

### **Typical Profile**

- 0 to 5 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1
- 5 to 10 inches—gravelly sandy clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
- 10 to 15 inches—gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6, A-7

15 to 37 inches—strongly cemented duripan  
 37 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded, no cemented pan throughout the profile  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Inclusion 2

*Position on landscape:* Summits of fan piedmont remnants at lower elevations  
*Contrasting features:* Lower water-supplying capacity, more than 35 percent clay above cemented pan  
*Distinctive present vegetation:* Shadscale, Bailey greasewood, galleta

#### Inclusion 3

*Position on landscape:* Ballenas and summits of fan piedmont remnants  
*Contrasting features:* No cemented pan throughout the profile, cooler soil temperature  
*Distinctive present vegetation:* Low sagebrush, Sandberg bluegrass

#### Inclusion 4

*Position on landscape:* Low hills and rock pediments

*Contrasting features:* Bedrock within a depth of 20 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Mickey Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—cemented pan, cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated  
*Range site:* 027X049N

## 3140—Loomer-Rowel-Downeyville association

### Map Unit Setting

*Position on landscape:* Mountains  
*Elevation:* 6,400 to 7,000 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 115 days

### Composition

#### Major components:

- Loomer very stony sandy loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic)—35 percent
- Rowel very cobbly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—25 percent
- Downeyville very cobbly fine sandy loam, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—25 percent

#### Contrasting inclusions:

- Inclusion 1: Lithic Argixerolls, very stony sandy loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid)—9 percent
- Inclusion 2: Mickey very gravelly sandy loam, 8 to 15 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—3 percent
- Inclusion 3: Smedley very gravelly sandy loam, 4 to 8

percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—3 percent

### **Characteristics of the Loomer Soil**

*Position on landscape:* Back slopes and north-facing shoulder slopes of mountains

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, Thurber needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 2 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 19 inches—extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam; 30 to 55 percent cobbles and stones, 65 to 80 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rowel Soil**

*Position on landscape:* South-facing shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, galleta

### **Typical Profile**

0 to 6 inches—very cobbly sandy loam; 35 to 60 percent cobbles and stones, 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 13 inches—very cobbly clay, extremely cobbly clay; 50 to 65 percent cobbles and stones, 55 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2

13 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Downeyville Soil**

*Position on landscape:* Lower parts of south-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### **Typical Profile**

0 to 4 inches—very cobbly fine sandy loam; 30 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsodic (SAR less

than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-2, A-1  
 4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
 9 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing back slopes of mountains  
*Slope features:* Shape—concave  
*Contrasting features:* Cooler average soil temperature, higher water-supplying capacity  
*Distinctive present vegetation:* Singleleaf pinyon pine, Utah juniper, low sagebrush

#### Inclusion 2

*Position on landscape:* Toe slopes of mountains and fanettes  
*Contrasting features:* Cemented pan within a depth of 20 inches, bedrock at a depth of more than 60 inches

#### Inclusion 3

*Position on landscape:* Toe slopes of mountains and alluvial fans at lower elevations  
*Contrasting features:* Cemented pan within a depth of 20 inches, bedrock at a depth of more than 60 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Loomer Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, large stones, slope  
*Local roads and streets:* Severe—depth to bedrock, large stones, slope  
*Roadfill:* Poor—depth to bedrock, large stones, slope  
*Sand:* Improbable source—excess fines, large stones  
*Gravel:* Improbable source—excess fines, large stones  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

### Ratings of the Rowel Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, large stones, erodes easily  
*Shallow excavations:* Severe—depth to bedrock, large stones, slope  
*Local roads and streets:* Severe—depth to bedrock, large stones, slope  
*Roadfill:* Poor—depth to bedrock, large stones, slope  
*Sand:* Improbable source—excess fines, large stones  
*Gravel:* Improbable source—excess fines, large stones  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

### Ratings of the Downeyville Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

### Interpretive Groups

*Capability classification:* Loomer soil—VIIs, nonirrigated; Rowel soil—VIIs, nonirrigated; Downeyville soil—VIIs, nonirrigated  
*Range site:* Loomer soil—029X002N; Rowel soil—027X049N; Downeyville soil—029X022N

## 3141—Loomer-Rowel-Wassit association

### Map Unit Setting

*Position on landscape:* Mountains  
*Elevation:* 6,800 to 7,400 feet  
*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 110 days

### **Composition**

#### *Major components:*

- Loomer very stony sandy loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic)—35 percent
- Rowel very stony sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—30 percent
- Wassit very stony sandy loam, 30 to 50 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Downeyville very stony fine sandy loam, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Typic Argixerolls, stony fine sandy loam, 30 to 75 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid)—3 percent
- Inclusion 4: Xeric Torriorthents, very stony sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy, mixed, frigid, shallow)—3 percent

### **Characteristics of the Loomer Soil**

*Position on landscape:* North-facing shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, Thurber needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones

#### **Typical Profile**

0 to 2 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 19 inches—extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam; 30 to 55 percent cobbles and stones, 65 to 80 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—GC; estimated AASHTO classification—A-2

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rowel Soil**

*Position on landscape:* South-facing shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

#### **Typical Profile**

0 to 6 inches—very stony sandy loam; 35 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 14 inches—very cobbly clay, extremely cobbly clay; 50 to 65 percent cobbles and stones, 55 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Wassit Soil**

*Position on landscape:* North-facing back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—volcanic rock  
*Slope features:* Length—long; shape—concave  
*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, pine bluegrass  
*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 6 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 6 to 12 inches—very gravelly loam, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 12 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* South-facing back slopes of mountains at lower elevations

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, shadscale, desert needlegrass, galleta

#### **Inclusion 3**

*Position on landscape:* North-facing back slopes of mountains

*Slope features:* Shape—concave

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush

#### **Inclusion 4**

*Position on landscape:* Eroded back slopes of mountains

*Contrasting features:* No layer of clay accumulation

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, black sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

#### **Woodland**

*Site index for singleleaf pinyon:* Wassit—39

*Most important native understory plants:* Wassit—antelope bitterbrush, mountain big sagebrush, pine bluegrass, needlegrass

#### **Ratings of the Loomer Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—thin layer, large stones

**Ratings of the Rowel Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones, erodes easily

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, thin layer

**Ratings of the Wassit Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Loomer soil—VIIIs, nonirrigated; Rowel soil—VIIIs, nonirrigated; Wassit soil—VIIIs, nonirrigated

*Range site:* Loomer soil—027X020N; Rowel soil—027X049N

*Woodland suitability group:* Wassit soil—1R

**3142—Loomer-Downeyville-Rock outcrop association****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

**Composition**

*Major components:*

- Loomer very stony sandy loam, 30 to 75 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic)—50 percent

- Downeyville very stony fine sandy loam, 30 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rowel very stony sandy loam, 30 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—8 percent

- Inclusion 2: Mirkwood very stony sandy loam, 50 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Aridic Argixerolls, 30 to 75 percent slopes (Aridic Argixerolls, clayey-skeletal, montmorillonitic, mesic, shallow)—3 percent

**Characteristics of the Loomer Soil**

*Position on landscape:* Shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Low sagebrush, pine bluegrass, Thurber needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones

**Typical Profile**

0 to 2 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 19 inches—extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam; 30 to 55 percent cobbles and stones, 65 to 80 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

19 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Downeyville Soil**

*Position on landscape:* South-facing back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 4 inches—very stony fine sandy loam; 30 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-2, A-1

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* South-facing back slopes of mountains at higher elevations

*Contrasting features:* Thin dark surface layer

*Distinctive present vegetation:* Low sagebrush, galleta

#### **Inclusion 2**

*Position on landscape:* South-facing back slopes of mountains

*Contrasting features:* Layer of greater clay accumulation, no dark surface layer

*Distinctive present vegetation:* Shadscale, desert needlegrass

#### **Inclusion 3**

*Position on landscape:* North- and east-facing back slopes and shoulder slopes of mountains

*Slope features:* Length—short; shape—concave

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Loomer Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Ratings of the Downeyville Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

### **Interpretive Groups**

*Capability classification:* Loomer soil—VIIIs, nonirrigated; Downeyville soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Loomer soil—027X020N; Downeyville soil—029X022N

## **3143—Loomer-Rowel-Rubble land association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,500 to 7,100 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Loomer very stony sandy loam, 30 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic)—40 percent
- Rowel very stony sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—30 percent
- Rubble land—15 percent

*Contrasting inclusions:*

- Inclusion 1: Haplic Durargids, stony sandy loam, 15 to 50 percent slopes (Haplic Durargids, clayey-skeletal, montmorillonitic, mesic, shallow)—6 percent
- Inclusion 2: Lithic Argixerolls, very stony sandy loam, 30 to 75 percent slopes (Lithic Argixerolls, clayey-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Xerollic Durargids, stony sandy loam, 15 to 30 percent slopes (Xerollic Durargids, clayey-skeletal, montmorillonitic, mesic, shallow)—4 percent

### **Characteristics of the Loomer Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum; source—andesite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, Thurber needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 2 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 19 inches—extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam; 30 to 55 percent cobbles and stones, 65 to 80 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

19 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Rowel Soil**

*Position on landscape:* South-facing back slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 6 inches—very stony sandy loam; 35 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 14 inches—very cobbly clay, extremely cobbly clay; 50 to 65 percent cobbles and stones, 55 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2  
14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Rubble Land

*Position on landscape:* Back slopes of mountains with more than 90 percent stones on the surface

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* South-facing back slopes of mountains at lower elevations

*Contrasting features:* Cemented pan over bedrock at a depth of less than 20 inches, lower water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 2

*Position on landscape:* North-facing back slopes of mountains

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

#### Inclusion 3

*Position on landscape:* North-facing shoulder slopes of mountains

*Contrasting features:* Cemented pan within a depth of 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

**Other inclusions (in only a few areas):** Xerollic Durargids, loamy-skeletal, mixed, mesic, shallow (small areas adjacent to the Lyon County line)

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Loomer Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—thin layer, large stones

### Ratings of the Rowel Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones, erodes easily

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### Interpretive Groups

*Capability classification:* Loomer soil—VIIIs, nonirrigated; Rowel soil—VIIIs, nonirrigated; Rubble land—VIIIIs

*Range site:* Loomer soil—027X020N; Rowel soil—027X049N

## 3150—Zyzzi very gravelly sandy loam, 8 to 30 percent slopes

### Map Unit Setting

*Position on landscape:* Hills

*Elevation:* 5,800 to 6,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 125 days

### Composition

#### Major components:

- Zyzzi very gravelly sandy loam, 8 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—85 percent

#### Contrasting inclusions:

- Inclusion 1: Typic Haplargids, very gravelly sandy loam, 8 to 30 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic, shallow)—5 percent
- Inclusion 2: Aridic Argixerolls, very cobbly sandy loam, 15 to 50 percent slopes (Aridic Argixerolls, clayey-skeletal, montmorillonitic, mesic, shallow)—4 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Rock outcrop—3 percent

### Characteristics of the Zyzzi Soil

*Position on landscape:* Back slopes, shoulder slopes, and crests of hills

*Parent material:* Kind—residuum; source—granitic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Low sagebrush, galleta, bottlebrush squirreltail

### Typical Profile

0 to 4 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 8 inches—extremely gravelly sandy clay loam, very gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, SM; estimated AASHTO classification—A-2

8 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* South-facing back slopes, crests, and shoulder slopes of hills

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 2

*Position on landscape:* Back slopes of mountains

*Contrasting features:* More than 35 percent clay at a depth of more than 5 inches, higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Basin big sagebrush, rabbitbrush

#### Inclusion 4

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Zyzzi Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 027X049N

### 3151—Zyzzi-Nupart association

#### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,000 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 110 days

#### Composition

*Major components:*

- Zyzzi very gravelly sandy loam, 15 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—55 percent
- Nupart very gravelly loamy sand, 30 to 50 percent slopes (Entic Haploxerolls, sandy-skeletal, mixed, frigid, shallow)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Lazan very gravelly loamy sand, 50 to 75 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—5 percent
- Inclusion 2: Typic Argixerolls, very gravelly sandy loam, 30 to 75 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid, shallow)—5 percent
- Inclusion 3: Typic Torriorthents, very stony sandy loam, 30 to 75 percent slopes (Typic Torriorthents, loamy-skeletal, mixed, mesic, shallow)—3 percent
- Inclusion 4: Rock outcrop—2 percent

#### Characteristics of the Zyzzi Soil

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, galleta, bottlebrush squirreltail

#### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 6 inches—extremely gravelly sandy clay loam, very gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 65 to 80 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, SM; estimated AASHTO classification—A-2

6 inches—weathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

#### Characteristics of the Nupart Soil

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, pine bluegrass, antelope bitterbrush

#### Typical Profile

0 to 2 inches—very gravelly loamy sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 5 inches—very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-1

5 to 20 inches—weathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* South-facing side slopes of mountains

*Contrasting features:* No layer of clay accumulation, no dark surface layer, warmer average soil temperature

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Side slopes of mountains

*Contrasting features:* Cooler average soil temperature, thick dark surface layer, layer of clay accumulation

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush, Sandberg bluegrass

#### **Inclusion 3**

*Position on landscape:* South-facing side slopes of mountains at lower elevations

*Contrasting features:* 3 to 15 percent stones on the surface, lower water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, galleta, shadscale

#### **Inclusion 4**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

#### **Woodland**

*Site index for singleleaf pinyon:* Nupart—40

*Most important native understory plants:* Nupart—antelope bitterbrush, mountain big sagebrush, pine bluegrass, needlegrass, green ephedra

### **Ratings of the Zyzzi Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Nupart Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, too sandy, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—thin layer

*Gravel:* Improbable source—thin layer

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Zyzzi soil—VIIs, nonirrigated;

Nupart soil—VIIs, nonirrigated

*Range site:* Zyzzi soil—027X049N

*Woodland suitability group:* Nupart soil—1R

## **3170—Ravenell-Haar-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Rock pediments

*Elevation:* 6,000 to 6,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Ravenell very gravelly loam, 15 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—40 percent

- Haar gravelly loam, 30 to 50 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—25 percent

- Rock outcrop—20 percent

*Contrasting inclusions:*

- Inclusion 1: Mickey very gravelly sandy loam, 4 to 15 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—7 percent

- Inclusion 2: Xeric Torriorthents, gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Aridic Haploxerolls, gravelly sandy loam, 30 to 75 percent slopes (Aridic Haploxerolls, loamy, mixed, mesic, shallow)—3 percent

### **Characteristics of the Ravenell Soil**

*Position on landscape:* Summits and shoulder slopes of rock pediments

*Parent material:* Kind—mixed alluvium over residuum; source—Tertiary sediments

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, galleta

#### **Typical Profile**

0 to 5 inches—very gravelly loam; 15 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

5 to 12 inches—very gravelly clay, very gravelly sandy clay; 15 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7, A-2

12 to 20 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Haar Soil**

*Position on landscape:* Back slopes of rock pediments

*Parent material:* Kind—residuum; source—Tertiary sedimentary rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, Indian ricegrass

#### **Typical Profile**

0 to 2 inches—gravelly loam; 0 to 5 percent cobbles

and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML, GM-GC; estimated AASHTO classification—A-4

2 to 6 inches—loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

6 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 4 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Small ridges and ledges of sedimentary rock, mostly on pediment shoulder slopes and back slopes

*Dominant present vegetation:* None

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Ballenas and fan piedmont remnants

*Contrasting features:* Cemented pan within a depth of 20 inches, bedrock at a depth of more than 60 inches

##### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

##### **Inclusion 3**

*Position on landscape:* North-facing back slopes of rock pediments

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

### **Woodland**

*Site index for common trees on the Haar soil:* Singleleaf pinyon—10; Utah juniper—10

*Most important native understory plants:* Haar soil—low sagebrush, galleta, Indian ricegrass, Nevada ephedra

### **Ratings of the Ravenell Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Haar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; coniferous plants (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Ravenell soil—VIIs, nonirrigated; Haar soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Ravenell soil—027X049N

*Woodland suitability group:* Haar soil—3R

## **3191—Wellsed-Mickey-Veet association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 6,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F  
*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Wellsed gravelly fine sand, 4 to 15 percent slopes (Xerollic Durargids, fine-loamy, mixed, mesic)—35 percent
- Mickey very gravelly sandy loam, 2 to 8 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—35 percent
- Veet very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Fulstone cobbly loam, 2 to 4 percent slopes (Abruptic Xerollic Durargids, clayey, montmorillonitic, mesic, shallow)—6 percent
- Inclusion 2: Haar cobbly loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—3 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Fallon fine sandy loam, saline-sodic, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—3 percent

### **Characteristics of the Wellsed Soil**

*Position on landscape:* Back slopes of fan piedmont remnants

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—very short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, galleta

### **Typical Profile**

0 to 6 inches—gravelly fine sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 15 inches—gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6

15 to 35 inches—gravelly loamy sand, loamy sand; 0 to 5 percent cobbles and stones, 10 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

35 to 50 inches—indurated duripan

50 to 60 inches—stratified loamy coarse sand to gravelly sandy loam; 0 to 5 percent cobbles and stones, 10 to 40 percent pebbles (by weight); massive; slightly hard, firm, brittle; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to hardpan:* 20 to 40 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Mickey Soil

*Position on landscape:* Fan piedmont remnant summits and shoulder slopes

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, Nevada ephedra, galleta

### Typical Profile

0 to 5 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

5 to 10 inches—gravelly sandy clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6

10 to 15 inches—gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6, A-7

15 to 37 inches—strongly cemented duripan

37 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Veet Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

**Typical Profile**

0 to 5 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Summits of fan piedmont remnants at higher elevations

*Contrasting features:* More than 35 percent clay above cemented pan

*Distinctive present vegetation:* Low sagebrush, bottlebrush squirreltail, Sandberg bluegrass

**Inclusion 2**

*Position on landscape:* Back slopes of fan piedmont remnants over hills

*Contrasting features:* Soft bedrock within a depth of 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* No cemented pan throughout the profile, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Inclusion 4**

*Position on landscape:* Inset fans adjacent to seeps

*Contrasting features:* No cemented pan throughout the profile, water table at a depth of 40 to 60 inches, less than 15 percent rock fragments throughout the profile

*Distinctive present vegetation:* Inland saltgrass, black greasewood

**Other inclusions (in only a few areas)**

- Smedley very gravelly sandy loam, 8 to 30 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)

*Position on landscape:* South-facing back slopes of partial ballenas and fan piedmont remnants

*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

- Fallon fine sandy loam, drained, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)

*Position on landscape:* Stream terraces

*Contrasting features:* Less than 15 percent rock fragments throughout the profile, no cemented pan throughout the profile, water table at a depth of 60 inches

*Distinctive present vegetation:* Basin big sagebrush, creeping wildrye

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Well-sed Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, frost action, slope

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Mickey Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Wellsed soil—IVe, irrigated, and VIs, nonirrigated; Mickey soil—VIIs, nonirrigated; Veet soil—VIIIs, nonirrigated

*Range site:* Wellsed soil—029X006N; Mickey soil—027X049N; Veet soil—029X049N

### **3192—Wellsed-Ravenell-Haar association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 6,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

#### **Composition**

*Major components:*

- Wellsed gravelly fine sand, 2 to 8 percent slopes (Xerollic Durargids, fine-loamy, mixed, mesic)—45 percent

- Ravenell very gravelly loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—25 percent

- Haar gravelly loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Veet very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—9 percent

- Inclusion 2: Fulstone cobbly loam, 2 to 4 percent slopes (Abruptic Xerollic Durargids, clayey, montmorillonitic, mesic, shallow)—3 percent

- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

#### **Characteristics of the Wellsed Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, galleta

#### **Typical Profile**

0 to 6 inches—gravelly fine sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 15 inches—gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6

15 to 35 inches—gravelly loamy sand, loamy sand; 0 to 5 percent cobbles and stones, 10 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

35 to 50 inches—indurated duripan

50 to 60 inches—stratified loamy coarse sand to gravelly sandy loam; 0 to 5 percent cobbles and stones, 10 to 40 percent pebbles (by weight);

massive; slightly hard, firm, brittle; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to hardpan:* 20 to 40 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—moderately slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Ravenell Soil

*Position on landscape:* Summits of rock pediment remnants  
*Parent material:* Mixed alluvium over residuum; source—Tertiary sediments  
*Slope features:* Length—very short; shape—slightly convex  
*Dominant present vegetation:* Low sagebrush, galleta

### Typical Profile

0 to 3 inches—very gravelly loam; 15 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 3 to 7 inches—very gravelly clay, very gravelly sandy clay; 15 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-7, A-2  
 7 to 11 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Haar Soil

*Position on landscape:* Side slopes of rock pediment remnants  
*Parent material:* Kind—residuum; source—Tertiary sedimentary rock  
*Slope features:* Length—very short; shape—concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, rabbitbrush, Indian ricegrass

### Typical Profile

0 to 2 inches—gravelly loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, CL-ML, GM-GC; estimated AASHTO classification—A-4  
 2 to 6 inches—loam, silt loam; 0 to 10 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4  
 6 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans

*Contrasting features:* Bedrock or cemented pan at a depth of more than 60 inches, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

#### **Inclusion 2**

*Position on landscape:* Summits of fan piedmont remnants

*Contrasting features:* Cemented pan within a depth of 20 inches, more than 35 percent clay above cemented pan

*Distinctive present vegetation:* Low sagebrush, Sandberg bluegrass

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Bedrock or cemented pan at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### **Woodland**

*Site index for common trees on the Haar soil:* Singleleaf pinyon—10; Utah juniper—10

*Most important native understory plants:* Haar—low sagebrush, galleta, Indian ricegrass, needlegrass, Nevada ephedra

#### **Ratings of the Wellsed Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Ravenell Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Haar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Wellsed soil—IVe, irrigated, and VIs, nonirrigated; Ravenell soil—VIIs, nonirrigated; Haar soil—VIIs, nonirrigated

*Range site:* Wellsed soil—029X006N; Ravenell soil—027X049N

*Woodland suitability group:* Haar soil—1D

### **3193—Wellsed-Wedlar association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 120 days

#### **Composition**

*Major components:*

- Wellsed gravelly fine sand, 2 to 8 percent slopes (Xerollic Durargids, fine-loamy, mixed, mesic)—45 percent
- Wedlar loamy sand, 2 to 4 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Veet very gravelly sandy loam, 2 to 4

percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 2 to 4 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Ravenell very gravelly loam, 4 to 8 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—3 percent
- Inclusion 4: Haar gravelly loam, 8 to 30 percent slopes (Xeric Torriorthents, loamy, mixed, nonacid, mesic, shallow)—2 percent

### **Characteristics of the Wellsed Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, galleta

### **Typical Profile**

- 0 to 7 inches—gravelly fine sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 7 to 17 inches—gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6
- 17 to 25 inches—gravelly loamy sand, loamy sand; 0 to 5 percent cobbles and stones, 10 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 25 to 45 inches—indurated duripan
- 45 to 60 inches—stratified loamy coarse sand to gravelly sandy loam; 0 to 5 percent cobbles and stones, 10 to 40 percent pebbles (by weight); massive; slightly hard, firm, brittle; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Wedlar Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—predominantly granitic alluvium with some welded rhyolitic tuff

*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, galleta

### **Typical Profile**

- 0 to 8 inches—loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 8 to 11 inches—loam; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4
- 11 to 31 inches—sandy clay loam, sandy clay; 0 to 5 percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6, A-7
- 31 to 60 inches—gravelly sandy loam, gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50

percent pebbles (by weight); massive; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2, A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 6 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fans  
*Contrasting features:* No layer of clay accumulation, rarely flooded

#### Inclusion 2

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded, more than 35 percent rock fragments throughout the profile  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* Summits of rock pediment remnants  
*Contrasting features:* Soft bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Low sagebrush, galleta

#### Inclusion 4

*Position on landscape:* Side slopes of rock pediment remnants  
*Contrasting features:* Soft bedrock within a depth of 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, desert needlegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Wellsed Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Wedlar Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—droughty, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Wellsed soil—IVe, irrigated, and VIs, nonirrigated; Wedlar soil—IIs, irrigated, and VIs, nonirrigated

*Range site:* Wellsed soil—029X006N; Wedlar soil—029X006N

## 3194—Wellsed-Smedley-Mickey association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 6,300 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 125 days

### Composition

*Major components:*

- Wellsed gravelly fine sand, 2 to 8 percent slopes

(Xerollic Durargids, fine-loamy, mixed, mesic)—40 percent

- Smedley very gravelly sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—25 percent

- Mickey gravelly loamy sand, 2 to 8 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Veet very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Typic Torrifluvents, gravelly fine sandy loam, 0 to 4 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic)—4 percent

- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Wedlar loamy sand, 8 to 30 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—3 percent

### **Characteristics of the Wellsed Soil**

*Position on landscape:* Higher summits of fan piedmont remnants

*Parent material:* Kind—alluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, galleta

### **Typical Profile**

0 to 6 inches—gravelly fine sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 15 inches—gravelly sandy clay loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6

15 to 30 inches—gravelly loamy sand, loamy sand; 0 to 5 percent cobbles and stones, 10 to 50 percent pebbles (by weight); massive; hard, firm; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

30 to 50 inches—indurated duripan

50 to 60 inches—stratified loamy coarse sand to gravelly sandy loam; 0 to 5 percent cobbles and stones, 10 to 40 percent pebbles (by weight); massive; slightly hard, firm, brittle; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to hardpan:* 20 to 40 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow;

below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—

2; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Smedley Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

2 to 18 inches—gravelly clay loam, gravelly clay, cobbly clay loam; 5 to 15 percent cobbles and stones, 20 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7

18 to 43 inches—strongly cemented duripan  
 43 to 60 inches—stratified extremely gravelly sand to extremely gravelly sandy loam; 15 to 30 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Mickey Soil

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Kind—alluvium; source—granitic rock  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Low sagebrush, Nevada ephedra, galleta

### Typical Profile

0 to 5 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 5 to 10 inches—gravelly sandy clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6

10 to 15 inches—gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; hard, firm; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, CL, GC; estimated AASHTO classification—A-6, A-7

15 to 37 inches—strongly cemented duripan  
 37 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Above the duripan—slow; below the duripan—moderately rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Inset fans  
*Contrasting features:* No cemented pan throughout the profile, no layer of clay accumulation, rarely flooded

#### Inclusion 2

*Position on landscape:* Inset fans at lower elevations  
*Contrasting features:* No cemented pan throughout the profile, occasionally flooded, no layer of clay accumulation  
*Distinctive present vegetation:* Bailey greasewood, Douglas rabbitbrush

#### Inclusion 3

*Position on landscape:* Channels  
*Contrasting features:* More than 35 percent rock

fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### **Inclusion 4**

*Position on landscape:* Side slopes of fan piedmont remnants

*Slope features:* Length—very short; shape—convex

*Contrasting features:* No cemented pan throughout the profile

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Wellsted Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Smedley Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan, low strength

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Mickey Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Wellsted soil—IVe, irrigated, and VIs, nonirrigated; Smedley soil—VIIs, nonirrigated; Mickey soil—VIIs, nonirrigated

*Range site:* Wellsted soil—029X006N; Smedley soil—027X015N; Mickey soil—027X049N

## **3210—Fallon-Fettic Variant-Fallon, saline-sodic, association**

### **Map Unit Setting**

*Position on landscape:* Stream terraces

*Elevation:* 5,800 to 6,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Fallon fine sandy loam, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—45 percent
  - Fettic Variant fine sandy loam, 0 to 2 percent slopes (Aridic Natriferolls, fine-loamy, mixed, mesic)—25 percent
  - Fallon fine sandy loam, saline-sodic, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Typic Torriferolls, gravelly fine sandy loam, 0 to 2 percent slopes (Typic Torriferolls, coarse-loamy, mixed [calcareous], mesic)—5 percent
  - Inclusion 2: Veet very gravelly sandy loam, 2 to 4 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—4 percent
  - Inclusion 3: Wedlar very gravelly sandy loam, 2 to 8 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—3 percent
  - Inclusion 4: Ravenell very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—3 percent

### **Characteristics of the Fallon Soil**

*Position on landscape:* Stream terraces

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Basin big sagebrush, rubber rabbitbrush, basin wildrye

**Typical Profile**

- 0 to 8 inches—fine sandy loam; subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4
- 8 to 60 inches—stratified sand to silt loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* 42 to 60 inches (April to September)  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 7 inches  
*Water-supplying capacity:* About 24 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.49; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* High

**Characteristics of the Fetic Variant**

- Position on landscape:* Higher stream terraces  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, inland saltgrass

**Typical Profile**

- 0 to 8 inches—fine sandy loam; 0 to 5 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 8 to 20 inches—clay loam, loam; prismatic structure; slightly hard, friable; strongly alkaline (pH 8.8); slightly saline (4 to 8 mmhos/cm); moderately sodic to strongly sodic (SAR 30 to 60); estimated Unified classification—CL; estimated AASHTO classification—A-6

- 20 to 60 inches—stratified loamy sand to clay loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; very strongly alkaline (pH 9.4); slightly saline to moderately saline (4 to 16 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, SM; estimated AASHTO classification—A-4

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* 48 to 72 inches (December to April)  
*Frequency of flooding:* Rare  
*Permeability:* Moderately slow  
*Available water capacity:* About 9 inches  
*Water-supplying capacity:* About 24 inches  
*Runoff:* Slow  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.32; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Moderate

**Characteristics of the Saline-sodic Fallon Soil**

- Position on landscape:* Stream terraces  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—smooth  
*Dominant present vegetation:* Black greasewood, inland saltgrass

**Typical Profile**

- 0 to 10 inches—fine sandy loam; subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); moderately saline (8 to 16 mmhos/cm); slightly sodic (SAR 13 to 16); estimated Unified classification—SM; estimated AASHTO classification—A-4
- 10 to 60 inches—stratified sand to silt loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline to slightly saline (less than 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* 42 to 60 inches (April to September)  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 20 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* High

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Highest stream terraces

*Contrasting features:* Water table at a depth of more than 60 inches, lower water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, shadscale, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* Inset fans and toe slopes of alluvial fans

*Contrasting features:* More than 35 percent rock fragments throughout the profile, lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Ballenas

*Contrasting features:* Water table at a depth of more than 60 inches, lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 4**

*Position on landscape:* Summits of rock pediments

*Contrasting features:* Soft bedrock within a depth of 14 inches, lower water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Fallon Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—fair; shallow water areas—fair

*Range seeding:* Poor—excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Fetic Variant for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—fair

*Range seeding:* Poor—excess salt, excess sodium

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, excess sodium

#### **Ratings of the Saline-sodic Fallon Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—fair; shallow water areas—fair

*Range seeding:* Poor—excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Fallon soil—IIw, irrigated, and VIIw, nonirrigated; Fetic Variant—IVw, irrigated, and VIIw, nonirrigated; saline-sodic Fallon soil—IIIw, irrigated, and VIIw, nonirrigated

*Range site:* Fallon soil—027X002N; Fetic Variant—027X002N; saline-sodic Fallon soil—027X005N

## **3212—Fallon-Slaw complex**

### **Map Unit Setting**

*Position on landscape:* Flood plains and river terraces

*Elevation:* 4,000 to 4,200 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

### Composition

#### Major components:

- Fallon sand, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—55 percent
- Slaw silt loam, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—30 percent
- Contrasting inclusions:
  - Inclusion 1: Fallon loamy fine sand, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—5 percent
  - Inclusion 2: Fallon loamy fine sand, non-flooded, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—4 percent
  - Inclusion 3: Sagouspe sand, frequently flooded, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—4 percent
  - Inclusion 4: Slaw silt loam, reclaimed, 0 to 2 percent slopes (Typic Torrifluvents, fine-silty, mixed [calcareous], mesic)—2 percent

### Characteristics of the Fallon Soil

*Position on landscape:* Stream terraces

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Creeping wildrye, western wheatgrass, rubber rabbitbrush, silver buffaloberry, cottonwood

### Typical Profile

0 to 14 inches—sand; massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

14 to 60 inches—stratified sand to silt loam; 0 to 15 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 42 to 60 inches (April to September)

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 20 inches

*Runoff:* Slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* High

### Characteristics of the Slaw Soil

*Position on landscape:* Higher river terraces

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Torrey quailbush, black greasewood, inland saltgrass, basin wildrye

### Typical Profile

0 to 9 inches—silt loam; subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); moderately saline (8 to 16 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4

9 to 40 inches—stratified very fine sandy loam to silty clay loam; massive; slightly hard, very friable; strongly alkaline (pH 8.8); moderately saline to strongly saline (more than 8 mmhos/cm); strongly sodic (SAR 46 to 60); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

40 to 60 inches—stratified loamy fine sand to silt loam; massive; soft, very friable; strongly alkaline (pH 8.6); slightly saline (4 to 8 mmhos/cm); nonsodic to slightly sodic (SAR 4 to 30); estimated Unified classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Pondered

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Higher well drained river terraces now being farmed

*Contrasting features:* Water table at a depth of more than 60 inches, average of less than 18 percent clay throughout the profile

*Distinctive present vegetation:* Irrigated pasture and hayland

#### **Inclusion 2**

*Position on landscape:* Higher well drained river terraces

*Contrasting features:* Water table at a depth of more than 60 inches, average of less than 18 percent clay throughout the profile

#### **Inclusion 3**

*Position on landscape:* Flood plains adjacent to Walker River

*Contrasting features:* Frequently flooded

*Distinctive present vegetation:* Willow, creeping wildrye

#### **Inclusion 4**

*Position on landscape:* Higher well drained river terraces now being farmed

*Contrasting features:* Siltier textures throughout the profile, SAR less than 13

*Distinctive present vegetation:* Irrigated pasture and hayland

**Other inclusions (in only a few areas):** Fluvaquentic Haploxerolls, fine sandy loam, 0 to 2 percent slopes (Fluvaquentic Haploxerolls, fine-loamy over sandy or sandy-skeletal, mixed, mesic)

*Position on landscape:* Concave oxbows

*Contrasting features:* Wetness, thick dark surface layer

*Distinctive present vegetation:* Torrey quailbush, black greasewood, inland saltgrass, basin wildrye, alkali sacaton

### **Major Uses**

**Current uses:** Homesites, irrigated cropland, rangeland, wildlife habitat

#### **Ratings of the Fallon Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—fair; shallow water areas—fair

*Range seeding:* Fair—excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

#### **Ratings of the Slaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, excess salt, excess sodium

*Shallow excavations:* Slight

*Local roads and streets:* Severe—low strength

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, excess sodium, excess salt

### **Interpretive Groups**

*Capability classification:* Fallon soil—IIw, irrigated, and VIw, nonirrigated; Slaw, soil—VIIs, nonirrigated

*Range site:* Fallon soil—027X002N; Slaw soil—027X041N

### **3220—Rowel very cobbly sandy loam, 8 to 30 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Mountains and side slopes of plateaus

*Elevation:* 5,800 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

#### **Composition**

*Major components:*

- Rowel very cobbly sandy loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Wellsed very cobbly sandy loam, 4 to 8 percent slopes (Xerollic Durargids, fine-loamy, mixed, mesic)—6 percent

- Inclusion 2: Veet very stony sandy loam, 4 to 15 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Rock outcrop—3 percent

- Inclusion 4: Mirkwood very stony sandy loam, 30 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—2 percent

#### **Characteristics of the Rowel Soil**

*Position on landscape:* Side slopes and crests of

mountains and shoulder slopes of plateaus

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, galleta

### Typical Profile

0 to 6 inches—very cobbly sandy loam; 35 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 14 inches—very cobbly clay, extremely cobbly clay; 50 to 65 percent cobbles and stones, 55 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Foot slopes of hills

*Contrasting features:* Cemented pan at a depth of 20 to 40 inches, slopes of less than 8 percent

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Inset fans

*Contrasting features:* No layer of clay accumulation, hard bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### Inclusion 4

*Position on landscape:* South-facing back slopes of mountains

*Contrasting features:* Slopes of more than 30 percent, lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, Bailey greasewood, desert needlegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Rowel Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 027X049N

## 3221—Rowel-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Hills and mountains

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### Composition

*Major components:*

- Rowel very stony sandy loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—70 percent

- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Wellsed very cobbly sandy loam, 4 to 8 percent slopes (Xerollic Durargids, fine-loamy, mixed, mesic)—7 percent

- Inclusion 2: Veet very gravelly sandy loam, 4 to 15 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Mirkwood very stony sandy loam, 30 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Rowel Soil**

*Position on landscape:* Back slopes of mountains and hills

*Parent material:* Kind—residuum; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Low sagebrush, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 6 inches—very stony sandy loam; 35 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 14 inches—very cobbly clay, extremely cobbly clay; 50 to 65 percent cobbles and stones, 55 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2

14 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 10 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Foot slopes of hills

*Contrasting features:* Cemented pan at a depth of 20 to 40 inches, slopes of less than 8 percent

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* No layer of clay accumulation, bedrock at a depth of more than 60 inches, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* South-facing lower back slopes of mountains

*Contrasting features:* Lower water-supplying capacity, warmer soil temperature

*Distinctive present vegetation:* Shadscale, Bailey greasewood, desert needlegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the the Rowel Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones, erodes easily

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, large stones, slope

*Roadfill:* Poor—depth to bedrock, large stones, slope

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Interpretive Groups**

*Capability classification:* Rowel soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs

*Range site:* Rowel soil—027X049N

### **3300—Typic Torriorthents, 4 to 15 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Shorelines

*Elevation:* 3,900 to 4,100 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 140 days

### Composition

#### Major components:

- Typic Torriorthents, 4 to 15 percent slopes (Typic Torriorthents, sandy or sandy-skeletal, mixed, mesic)—95 percent

#### Contrasting inclusions:

- Inclusion 1: Gynelle very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

### Characteristics of the Typic Torriorthents

*Position on landscape:* Beach terraces

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Fourwing saltbush, desert needlegrass, Nevada ephedra, Cooper wolfberry, Indian ricegrass, shadscale

### Reference Profile

0 to 10 inches—gravelly loamy fine sand, very gravelly coarse sand, sand; 0 to 15 percent cobbles and stones, 0 to 75 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, SP, GM, SM; estimated AASHTO classification—A-1, A-2, A-3

10 to 60 inches—sand, gravelly loamy fine sand, extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 0 to 90 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, SP, GM, SM; estimated AASHTO classification—A-1, A-2, A-3

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Rapid

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan skirts above beach terraces

*Contrasting features:* Layer of carbonate accumulation

### Major Uses

**Current uses:** Rangeland, wildlife habitat, homesites

### Ratings of the Typic Torriorthents for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope, flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, piping

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

## 3310—Veta-Smedley association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,400 to 6,200 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

#### Major components:

- Veta very gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—70 percent

- Smedley very gravelly sandy loam, 2 to 8 percent slopes (Haplic Durargids, clayey, montmorillonitic, mesic, shallow)—15 percent

#### Contrasting inclusions:

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Mickey very gravelly sandy loam, 2 to 8 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—5 percent

### Characteristics of the Veta Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass

### Typical Profile

0 to 4 inches—very gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

4 to 17 inches—extremely gravelly loam, very gravelly sandy loam, very gravelly loam; 10 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

17 to 60 inches—stratified extremely gravelly loamy sand to very gravelly loam; 10 to 25 percent cobbles and stones, 50 to 80 percent pebbles (by weight); massive; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Smedley Soil

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### Typical Profile

0 to 2 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

2 to 18 inches—gravelly clay loam, gravelly clay, cobbly clay loam; 5 to 15 percent cobbles and stones, 20 to 35 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL; estimated AASHTO classification—A-7

18 to 43 inches—strongly cemented duripan

43 to 60 inches—stratified extremely gravelly sand to extremely gravelly sandy loam; 15 to 30 percent cobbles and stones, 65 to 80 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* About 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—slow; below the duripan—moderately rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels

*Contrasting features:* Sandier textures throughout the profile, occasionally flooded, more than 35 percent

rock fragments throughout the profile

*Distinctive present vegetation:* Rabbitbrush, burrobrush, spiny hopsage

#### **Inclusion 2**

*Position on landscape:* Channels at higher elevations

*Contrasting features:* Sandier textures throughout the profile, occasionally flooded, more than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Summits of fan piedmont remnants at higher elevations

*Contrasting features:* Cemented pan at a depth of 14 to 20 inches, average of less than 35 percent clay above the pan

*Distinctive present vegetation:* Low sagebrush, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Veta Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Smedley Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan, low strength

*Roadfill:* Poor—cemented pan

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Veta soil—IVs, irrigated, and VIIs, nonirrigated; Smedley soil—VIIs, nonirrigated

*Range site:* Veta soil—026X024N; Smedley soil—027X015N

## **4000—Garhill-Blacktop association**

### **Map Unit Setting**

*Position on landscape:* Mesas

*Elevation:* 5,400 to 6,500 feet

*Average annual precipitation:* About 7 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Garhill very stony loamy fine sand, 4 to 30 percent slopes (Typic Durorthids, loamy, mixed, mesic, shallow)—75 percent
- Blacktop very stony fine sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Downeyville very cobbly fine sandy loam, moist, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Typic Torriorthents, gravelly sandy loam, 15 to 50 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—4 percent
- Inclusion 3: Tejabe very stony fine sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—3 percent
- Inclusion 4: Rock outcrop—2 percent

### **Characteristics of the Garhill Soil**

*Position on landscape:* Summits of mesas

*Parent material:* Kind—residuum; source—basalt with additions of eolian material high in volcanic ash

*Slope features:* Length—short; shape—convex to concave

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

*Percent of surface covered by rock fragments:* 30 percent pebbles, 15 percent cobbles, 7 percent stones

### **Typical Profile**

0 to 1 inch—very stony loamy fine sand; 20 to 30 percent cobbles and stones, 25 to 50 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

1 to 5 inches—fine sandy loam; 0 to 5 percent cobbles and stones, 10 to 25 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/

cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

5 to 9 inches—gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4, A-2

9 to 23 inches—indurated duripan

23 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 7 to 14 inches

*Depth to bedrock:* 12 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Blacktop Soil

*Position on landscape:* Back slopes of mesas

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 7 inches—very stony fine sandy loam; 25 to 45 percent cobbles and stones, 40 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of mesas at lower elevations

*Contrasting features:* Layer of clay accumulation, no cemented pan

#### Inclusion 2

*Position on landscape:* North-facing back slopes of mesas at lower elevations

*Contrasting features:* Higher water-supplying capacity, no cemented pan, bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Bailey greasewood, Sandberg bluegrass

#### Inclusion 3

*Position on landscape:* North-facing side slopes of mesas at higher elevations

*Contrasting features:* No cemented pan, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 4

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Garhill Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—cemented pan, depth to bedrock, slope

*Local roads and streets:* Severe—cemented pan, depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Blacktop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### **Interpretive Groups**

*Capability classification:* Garhill soil—VIIs, nonirrigated; Blacktop soil—VIIs, nonirrigated  
*Range site:* Garhill soil—029X036N; Blacktop soil—029X033N

### **4021—Argalt-Gabbvally association**

#### **Map Unit Setting**

*Position on landscape:* Mesas  
*Elevation:* 6,500 to 7,600 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 120 days

#### **Composition**

*Major components:*

- Argalt very stony fine sandy loam, 4 to 30 percent slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—75 percent
- Gabbvally very stony loam, 30 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Tejabe very stony fine sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—5 percent
- Inclusion 2: Blacktop very stony sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
- Inclusion 3: Calpeak very stony sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—3 percent
- Inclusion 4: Rock outcrop—2 percent

#### **Characteristics of the Argalt Soil**

*Position on landscape:* Summits and shoulder slopes of mesas  
*Parent material:* Kind—residuum; source—basalt mixed with eolian material high in volcanic ash  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Black sagebrush, rabbitbrush, galleta, spiny menodora  
*Percent of surface covered by rock fragments:* 25 percent pebbles, 10 percent cobbles, 15 percent stones

#### **Typical Profile**

- 0 to 1 inch—very stony fine sandy loam; 35 to 45 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2
- 1 to 3 inches—very fine sandy loam; 0 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—ML; estimated AASHTO classification—A-4
- 3 to 9 inches—clay loam, loam; 0 to 5 percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL; estimated AASHTO classification—A-6
- 9 to 11 inches—indurated duripan  
 11 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to hardpan:* 8 to 14 inches  
*Depth to bedrock:* 10 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 1.5 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Gabbvally Soil**

*Position on landscape:* South-facing back slopes of mesas

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta, rabbitbrush

*Percent of surface covered by rock fragments:* 5 percent stones

### **Typical Profile**

0 to 2 inches—very stony loam; 10 to 40 percent cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing back slopes of mesas

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### **Inclusion 2**

*Position on landscape:* South-facing mesas at lower elevations

*Contrasting features:* Lower water-supplying capacity, no layer of clay accumulation

*Distinctive present vegetation:* Shadscale, Indian ricegrass

#### **Inclusion 3**

*Position on landscape:* Eroded south-facing back slopes of mesas

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### **Inclusion 4**

*Position on landscape:* Scattered areas of rimrock on shoulder slopes of mesas and scattered small peaks throughout the map unit

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Argalt Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones, cemented pan

*Shallow excavations:* Severe—depth to bedrock, cemented pan, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Argalt soil—VII<sub>s</sub>, nonirrigated;  
Gabbvally soil—VII<sub>s</sub>, nonirrigated

*Range site:* Argalt soil—029X014N; Gabbvally soil—  
029X010N

## **4030—Koyen-Geer association**

### **Map Unit Setting**

*Position on landscape:* Fanlettes and remnants of inset fans

*Elevation:* 5,200 to 5,400 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Koyen gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—55 percent

- Geer fine sandy loam, 0 to 4 percent slopes (Typic Torriorthents, coarse-loamy, mixed [calcareous], mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 0 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Roic loamy sand, overblown, 4 to 15 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—5 percent

### **Characteristics of the Koyen Soil**

*Position on landscape:* Fanlettes

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—smooth

*Dominant present vegetation:* Bailey greasewood, shadscale, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

4 to 45 inches—stratified loam to gravelly loamy sand; 15 to 25 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.8); nonsaline

(less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

45 to 60 inches—gravelly loamy sand, very gravelly loamy sand; 45 to 55 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Geer Soil**

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Winterfat, Indian ricegrass

### **Typical Profile**

0 to 14 inches—fine sandy loam; subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, ML; estimated AASHTO classification—A-4

14 to 60 inches—stratified fine sandy loam to silt loam; massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SM-SC, ML, CL-ML; estimated AASHTO classification—A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Sandy textures throughout the profile, more than 35 percent rock fragments throughout the profile, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Low hills  
*Contrasting features:* Soft bedrock within a depth of 20 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### **Ratings of the Koyen Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Moderate—thin layer, piping, seepage

### **Ratings of the Geer Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—good; domestic grasses and legumes (irrigated)—good; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Koyen soil—IIIe, irrigated, and VIIc, nonirrigated; Geer soil—IIc, irrigated, and VIIc, nonirrigated

*Range site:* Koyen soil—029X046N; Geer soil—029X020N

## **4050—Haarvar-Wrango association**

### **Map Unit Setting**

*Position on landscape:* Rock pediments and fan piedmonts

*Elevation:* 6,000 to 6,600 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 125 days

### **Composition**

*Major components:*

- Haarvar gravelly clay loam, 4 to 30 percent slopes (Xeric Torriorthents, clayey, montmorillonitic [calcareous], mesic, shallow)—70 percent
- Wrango gravelly fine sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, coarse-loamy, mixed, mesic)—8 percent
- Inclusion 2: Xeric Torriorthents, gravelly fine sandy loam, 2 to 8 percent slopes (Xeric Torriorthents, clayey, mixed, mesic, shallow)—3 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Xerollic Haplargids, gravelly fine sandy loam, 2 to 8 percent slopes (Xerollic Haplargids, fine-loamy, mixed, mesic)—2 percent

### **Characteristics of the Haarvar Soil**

*Position on landscape:* Crests and side slopes of rock pediments

*Parent material:* Kind—residuum; source—Tertiary sedimentary rock

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Black sagebrush, Nevada

ephedra, galleta, pine bluegrass

*Percent of surface covered by rock fragments:* 20 percent pebbles

### Typical Profile

0 to 1 inch—gravelly clay loam; 25 to 40 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL; estimated AASHTO classification—A-7

1 to 14 inches—clay; 0 to 10 percent pebbles (by weight); massive; hard, very firm; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

14 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.28; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Characteristics of the Wrango Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Black sagebrush, spiny hopsage, Nevada ephedra, Indian ricegrass

### Typical Profile

0 to 3 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4

3 to 10 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by

weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2

10 to 60 inches—extremely gravelly loamy coarse sand, extremely gravelly sand, extremely gravelly loamy sand; 5 to 40 percent cobbles and stones, 70 to 85 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.32; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of inset fans

*Contrasting features:* Bedrock at a depth of more than 60 inches, average of less than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Toe slopes of rock pediments

*Contrasting features:* No carbonates throughout the profile, sandier surface

*Distinctive present vegetation:* Wyoming big sagebrush

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Inclusion 4

*Position on landscape:* Summits of fan piedmont remnants

*Contrasting features:* Layer of clay accumulation, bedrock at a depth of more than 60 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Haarvar Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—shrink-swell, slope, low strength  
*Roadfill:* Poor—depth to bedrock, shrink-swell, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, hard to pack

#### Ratings of the Wrango Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Fair—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Haarvar soil—VIIe, nonirrigated; Wrango soil—VIIs, nonirrigated

*Range site:* Haarvar soil—029X014N; Wrango soil—028X011N

## 4061—Truhoy-Wardenot association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,600 to 6,400 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Truhoy very gravelly fine sandy loam, 4 to 30 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—65 percent
- Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Wardenot very gravelly loamy sand, moist, 8 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent
- Inclusion 3: Pintwater very gravelly sandy loam, moist, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

### Characteristics of the Truhoy Soil

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta, Indian ricegrass

*Percent of surface covered by rock fragments:* 45 percent pebbles

### Typical Profile

- 0 to 2 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2
- 2 to 11 inches—gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4
- 11 to 17 inches—strongly cemented duripan
- 17 to 60 inches—stratified very gravelly loamy sand to extremely gravelly coarse sand; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; very strongly alkaline (pH 9.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderate; below the duripan—rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Wardenot Soil**

*Position on landscape:* Remnants of inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Spiny menodora, shadscale, galleta, Indian ricegrass

### **Typical Profile**

0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1  
 5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Fan aprons  
*Contrasting features:* Slopes of more than 8 percent

#### **Inclusion 3**

*Position on landscape:* Hills  
*Contrasting features:* Hard bedrock within a depth of 20 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Truhoy Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cemented pan, cutbanks cave, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Fair—slope  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Interpretive Groups**

*Capability classification:* Truhoy soil—VIIs, nonirrigated; Wardenot soil—VIIs, nonirrigated  
*Range site:* Truhoy soil—029X036N; Wardenot soil—029X036N

## **4062—Truhoy gravelly loamy sand, 2 to 8 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,100 to 5,300 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Truhoy gravelly loamy sand, 2 to 8 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Durorthidic Torriorthents, very gravelly loamy sand, 15 to 50 percent slopes (Durorthidic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Roic gravelly sandy loam, dry, 30 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—2 percent

### Characteristics of the Truhoy Soil

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta, Indian ricegrass

### Typical Profile

0 to 2 inches—gravelly loamy sand; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly sandy loam, gravelly loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

11 to 17 inches—strongly cemented duripan

17 to 60 inches—stratified very gravelly loamy sand to extremely gravelly coarse sand; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; very strongly alkaline

(pH 9.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to hardpan:* 6 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderate; below the duripan—rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of inset fans

*Contrasting features:* No cemented pan throughout the profile, more than 35 percent rock fragments throughout the profile

#### Inclusion 2

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* No strongly cemented pan throughout the profile, slopes of more than 15 percent, lower water-supplying capacity

*Distinctive present vegetation:* Shadscale

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* No cemented pan throughout the profile, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### Inclusion 4

*Position on landscape:* Side slopes of fan piedmont remnants over sedimentary hills

*Contrasting features:* Soft bedrock within a depth of 20 inches, slopes of more than 30 percent

*Distinctive present vegetation:* Shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Truhoy Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X036N

## **4070—Zadvar-Stewval association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and hills

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Zadvar gravelly fine sandy loam, 4 to 30 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—55 percent
- Stewval very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Wrango very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, occasionally flooded, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Rock outcrop—2 percent

### **Characteristics of the Zadvar Soil**

*Position on landscape:* Side slopes and summits of fan piedmont remnants and summits of alluvial fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, galleta, Nevada ephedra

### **Typical Profile**

0 to 6 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-1

6 to 11 inches—gravelly clay loam, sandy clay loam; 0 to 5 percent cobbles and stones, 15 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6

11 to 28 inches—strongly cemented duripan

28 to 60 inches—stratified extremely gravelly sandy loam to very gravelly coarse sand; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 10 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Stewval Soil**

*Position on landscape:* Hills

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff, andesite

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

**Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Inset fans

*Contrasting features:* No layer of clay accumulation, rarely flooded

**Inclusion 2**

*Position on landscape:* Remnants of inset fans

*Contrasting features:* No layer of clay accumulation, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Inclusion 4**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Zadvar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—cemented pan, cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Stewval Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Zadvar soil—VII<sub>s</sub>, nonirrigated; Stewval soil—VII<sub>s</sub>, nonirrigated

*Range site:* Zadvar soil—029X008N; Stewval soil—029X014N

**4071—Zadvar-Wrango association****Map Unit Setting**

*Position on landscape:* Fan piedmonts and hills

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

**Composition**

*Major components:*

- Zadvar very gravelly sandy loam, 4 to 30 percent

slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—70 percent

- Wrango very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Armespan very gravelly sandy loam, 4 to 15 percent slopes (Durixerollic Calciorthids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Duric Haplargids, very gravelly sandy loam, 4 to 15 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—2 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Zadvar Soil**

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Nevada ephedra

### **Typical Profile**

0 to 6 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); platy structure; hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

6 to 11 inches—gravelly clay loam, sandy clay loam; 0 to 5 percent cobbles and stones, 15 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6

11 to 28 inches—strongly cemented duripan

28 to 60 inches—stratified extremely gravelly sandy loam to very gravelly coarse sand; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 10 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Wrango Soil**

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Black sagebrush, spiny hopsage, Nevada ephedra, Indian ricegrass

### **Typical Profile**

0 to 4 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

4 to 10 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM, GM-GC, SM-SC; estimated AASHTO classification—A-1, A-2

10 to 60 inches—stratified extremely gravelly sand to extremely gravelly loamy coarse sand; 5 to 30 percent cobbles and stones, 70 to 85 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 30 percent, no layer of clay accumulation

#### **Inclusion 2**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Contrasting features:* No layer of clay accumulation, no cemented pan throughout the profile

#### **Inclusion 3**

*Position on landscape:* Summits of fan piedmont remnants at lower elevations

*Contrasting features:* No cemented pan throughout the profile, lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, shadscale

#### **Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, no cemented pan throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Other inclusions (in only a few areas):** Stewval very gravelly sandy loam, 4 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)

*Position on landscape:* Low hills

*Contrasting features:* Hard bedrock within a depth of 20 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Zadvar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—cemented pan, cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Wrango Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Fair—droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Zadvar soil—VIIs, nonirrigated; Wrango soil—VIIs, nonirrigated

*Range site:* Zadvar soil—029X008N; Wrango soil—028X011N

## **4073—Zadvar-Veet association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and hills

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Zadvar gravelly fine sandy loam, 4 to 15 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—65 percent
- Veet gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, loam, 30 to 50 percent slopes (Xeric Torriorthents, clayey, mixed [calcareous], mesic, shallow)—6 percent
- Inclusion 2: Xeric Torriorthents, gravelly sandy loam, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

- Inclusion 4: Durixerollic Haplargids, gravelly sandy loam, 4 to 15 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—2 percent

### **Characteristics of the Zadvar Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Nevada ephedra

### **Typical Profile**

0 to 6 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-1

6 to 11 inches—gravelly clay loam, sandy clay loam; 0 to 5 percent cobbles and stones, 15 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC, CL, SC; estimated AASHTO classification—A-6

11 to 28 inches—strongly cemented duripan

28 to 60 inches—stratified extremely gravelly sandy loam to very gravelly coarse sand; 0 to 15 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; very hard, firm; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to hardpan:* 10 to 14 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Above the duripan—moderately slow; below the duripan—rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Veet Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 5 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

5 to 20 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

20 to 60 inches—stratified extremely gravelly sandy loam to very gravelly loamy coarse sand; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Soft bedrock within a depth of 20 inches, average of more than 35 percent clay throughout the profile

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, black sagebrush

#### **Inclusion 2**

*Position on landscape:* Upper part of back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 15 percent, no cemented pan throughout the profile

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, sandy textures throughout the profile, no cemented pan throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Lower parts of back slopes of fan piedmont remnants

*Contrasting features:* No strongly cemented pan throughout the profile, layer of clay accumulation

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Zadvar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—cemented pan, cutbanks cave

*Local roads and streets:* Moderate—cemented pan, slope, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Veet Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Zadvar soil—VIIs, nonirrigated; Veet soil—VIIs, nonirrigated

*Range site:* Zadvar soil—029X008N; Veet soil—029X049N

## **4080—Truvar-Crunker association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,800 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Truvar gravelly loamy sand, 2 to 8 percent slopes (Haploxerollic Durorthids, loamy, mixed, mesic, shallow)—70 percent

- Crunker very gravelly sandy loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Xerollic Camborthids, gravelly loamy sand, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Truvar Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, Indian ricegrass, galleta

*Percent of surface covered by rock fragments:* 25 percent pebbles

### **Typical Profile**

0 to 2 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); single grained; loose; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 17 inches—gravelly sandy loam, gravelly coarse sandy loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

17 to 60 inches—strongly cemented duripan

**Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Crunker Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

**Typical Profile**

0 to 12 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1  
 12 to 60 inches—stratified gravelly coarse sand to extremely gravelly sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Higher inset fans  
*Contrasting features:* No cemented pan, sandy loam texture throughout the profile

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Truvar Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, too sandy  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan  
*Roadfill:* Poor—cemented pan  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Crunker Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor  
*Range seeding:* Poor—small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, frost action  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Truvar soil—VIIs, nonirrigated; Crunker soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Truvar soil—029X006N; Crunker soil—029X049N

**4081—Truvar-Fadoll association****Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,800 to 6,100 feet  
*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Truvar gravelly loamy sand, 2 to 4 percent slopes (Haploxerollic Durorthids, loamy, mixed, mesic, shallow)—50 percent
- Fadoll gravelly loamy sand, dry, 2 to 4 percent slopes (Xeric Torriorthents, ashy, nonacid, mesic)—45 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, gravelly loamy sand, 2 to 4 percent slopes (Xeric Torriorthents, coarse-loamy, mixed, mesic)—5 percent

### **Characteristics of the Truvar Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, Indian ricegrass, galleta

### **Typical Profile**

0 to 2 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); single grained; loose; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

2 to 17 inches—gravelly sandy loam, gravelly coarse sandy loam; 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

17 to 60 inches—strongly cemented duripan

### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Fadoll Soil**

*Position on landscape:* Inset fans

*Parent material:* Water-reworked alluvium and lesser amounts of eolian volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 10 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

10 to 35 inches—loamy sand, sand; 0 to 25 percent pebbles (by weight); massive; very hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

35 to 60 inches—very gravelly sand; 50 to 65 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fan remnants

*Contrasting features:* No cemented pan, sandy loam texture throughout the profile

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Truvar Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, too sandy

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

#### Ratings of the Fadoll Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* Truvar soil—VIIs, nonirrigated; Fadoll soil—IIIs, irrigated, and VIIs, nonirrigated

*Range site:* Truvar soil—029X006N; Fadoll soil—029X049N

## 4090—Eaglepass-Rock outcrop complex, 30 to 75 percent slopes

### Map Unit Setting

*Position on landscape:* Mountains and hills

*Elevation:* 6,000 to 7,600 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### Composition

*Major components:*

- Eaglepass extremely stony loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—60 percent
- Rock outcrop—25 percent

### Contrasting inclusions:

- Inclusion 1: Kyler very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—8 percent
- Inclusion 2: Theriot very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, carbonatic, mesic)—4 percent
- Inclusion 3: Typic Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### Characteristics of the Eaglepass Soil

*Position on landscape:* Side slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Littleleaf mountainmahogany, black sagebrush, Nevada greasewood

*Percent of surface covered by rock fragments:* 45 percent pebbles, 15 percent cobbles, 15 percent stones

### Typical Profile

0 to 1 inch—extremely stony loam; 30 to 45 percent cobbles and stones, 40 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

1 to 5 inches—extremely stony loam, very cobbly fine sandy loam, extremely gravelly sandy loam; 25 to 45 percent cobbles and stones, 40 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

5 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 6 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 4 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—high; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges  
*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of mountains  
*Slope features:* Length—short; shape—slightly concave  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Black sagebrush, galleta

#### **Inclusion 2**

*Position on landscape:* South-facing side slopes of hills at lower elevations  
*Contrasting features:* Lower water-supplying capacity  
*Distinctive present vegetation:* Spiny menodora, desert needlegrass

#### **Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, burrobrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Eaglepass Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Interpretive Groups**

*Capability classification:* Eaglepass soil—VIIs, nonirrigated; Rock outcrop—VIIIs  
*Range site:* Eaglepass soil—029X040N

## **4100—Stumble loamy sand, 2 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan skirts  
*Elevation:* 4,900 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Stumble loamy sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Inmo loamy sand, overblown, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Typic Torriorthents, loamy sand, 0 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—4 percent
- Inclusion 3: Isolde fine sand, 2 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent
- Inclusion 4: Izo very gravelly sand, 0 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Stumble Soil**

*Position on landscape:* Fan skirts  
*Parent material:* Kind—eolian material over alluvium; source—various kinds of rock  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, winterfat

### **Typical Profile**

0 to 12 inches—loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 12 to 18 inches—loamy fine sand, loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; moderate alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 18 to 60 inches—gravelly loamy sand, gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 30 to 50 percent pebbles (by weight); massive; soft, very

friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Higher fan piedmont remnants  
*Contrasting features:* More than 35 percent rock fragments throughout the profile

#### Inclusion 2

*Position on landscape:* Lower fan skirts  
*Contrasting features:* Layer with more than 35 percent rock fragments in the upper 40 inches  
*Distinctive present vegetation:* Black greasewood, shadscale

#### Inclusion 3

*Position on landscape:* Sand sheets and sand dunes  
*Contrasting features:* Less than 10 percent rock fragments throughout the profile, fine sand throughout the profile  
*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

#### Inclusion 4

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded, more than 35 percent rock fragments throughout the profile  
*Distinctive present vegetation:* Burrobrush, rabbitbrush  
**Other inclusions (in only a few areas):** Xeric Torriorthents, loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy, mixed, mesic), in Whiskey Flat area

*Position on landscape:* Remnants of inset fans  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, galleta, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Stumble Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated  
*Range site:* 027X009N

## 4102—Stumble loamy fine sand, 4 to 15 percent slopes

### Map Unit Setting

*Position on landscape:* Sand sheets over fan piedmonts  
*Elevation:* 5,000 to 5,800 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Stumble loamy fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Stumble loamy fine sand, 15 to 30 percent slopes (Typic Torripsamments, mixed, mesic)—8 percent
- Inclusion 2: Typic Torriorthents, very stony loamy sand, 8 to 30 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Isolde fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent
- Inclusion 4: Izo very gravelly loamy sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### Characteristics of the Stumble Soil

*Position on landscape:* Sand sheets over fan piedmont remnants  
*Parent material:* Kind—eolian material over alluvium; source—various kinds of rock  
*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Indian ricegrass, fourwing saltgrass, winterfat

### Typical Profile

0 to 12 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

12 to 18 inches—loamy fine sand, loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

18 to 60 inches—gravelly loamy sand, gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 30 to 50 percent pebbles (by weight); massive, soft, very friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sand sheets over fan piedmont remnants

*Contrasting features:* Slopes of more than 15 percent

#### Inclusion 2

*Position on landscape:* Side slopes of fan piedmont remnants with sand sheets

*Contrasting features:* More than 35 percent rock fragments throughout the profile

#### Inclusion 3

*Position on landscape:* Semistabilized sand dunes

*Contrasting features:* Less than 10 percent rock fragments throughout the profile, fine sand throughout the profile, more erosive

*Distinctive present vegetation:* Hairy horsebrush

#### Inclusion 4

*Position on landscape:* Channels

*Contrasting features:* More than 35 percent rock fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush

**Other inclusions (in only a few areas):** Truhoy very gravelly sandy loam, 8 to 30 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)

*Position on landscape:* Nonburied fan piedmont remnants

*Contrasting features:* Cemented pan, sandy loam surface texture

*Distinctive present vegetation:* Spiny menodora, shadscale, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Stumble Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 027X009N

## 4103—Stumble-Stumble, sodic, loamy fine sands, 0 to 8 percent slopes

### Map Unit Setting

*Position on landscape:* Sand sheets over river terraces

*Elevation:* 4,100 to 5,000 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

### Composition

*Major components:*

- Stumble loamy fine sand, 0 to 2 percent slopes (Typic

Torripsamments, mixed, mesic)—50 percent

- Stumble loamy fine sand, sodic, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, sandy loam, 0 to 2 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—5 percent
- Inclusion 2: Fallon loamy fine sand, non-flooded, 0 to 2 percent slopes (Aquic Xerofluvents, coarse-loamy, mixed, nonacid, mesic)—5 percent
- Inclusion 3: Typic Torripsamments, fine sand, 0 to 2 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent
- Inclusion 4: Typic Torripsamments, sand, 0 to 2 percent slopes (Typic Torripsamments, mixed, mesic)—2 percent

### **Characteristics of the Nonsodic Stumble Soil**

*Position on landscape:* Sand sheets

*Parent material:* Kind—eolian material over alluvium; source—various kinds of rock

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Fourwing saltbush, rubber rabbitbrush, Nevada dalea, Indian ricegrass, inland saltgrass

### **Typical Profile**

0 to 6 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

6 to 29 inches—loamy fine sand, loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

29 to 60 inches—gravelly loamy sand, gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 30 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Sodic Stumble Soil**

*Position on landscape:* Stabilized sand dunes

*Parent material:* Kind—eolian material over alluvium; source—various kinds of rock

*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Black greasewood, fourwing saltbush, seepweed, Indian ricegrass, rubber rabbitbrush

### **Typical Profile**

0 to 6 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

6 to 29 inches—loamy fine sand, loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

29 to 60 inches—gravelly loamy sand, gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 30 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); slightly sodic (SAR 13 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.17; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Interdune flats  
*Contrasting features:* Loamy surface layer  
*Distinctive present vegetation:* Shadscale, black greasewood, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* River terraces  
*Contrasting features:* More loamy textures  
*Distinctive present vegetation:* Torrey quailbush, black greasewood

#### **Inclusion 3**

*Position on landscape:* River terraces  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Torrey quailbush, black greasewood, rubber rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Lower, more recent river terraces adjacent to the river  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Inland saltgrass, rubber rabbitbrush

#### **Other inclusions (in only a few areas)**

- Wabuska loamy sand, 0 to 2 percent slopes (Aeric Halaquepts, coarse-loamy, mixed [calcareous], mesic), adjacent to Teel's Marsh

*Position on landscape:* Lake plains  
*Contrasting features:* Water table at a depth of 30 to 40 inches, moderately sodic layers within the profile

*Distinctive present vegetation:* Black greasewood, seepweed, shadscale, inland saltgrass

- Cirac loamy fine sand, ponded, 0 to 2 percent slopes (Typic Torrifluvents, coarse-loamy, mixed [calcareous], mesic), adjacent to Teel's Marsh

*Position on landscape:* Alluvial flats  
*Contrasting features:* Not sandy throughout the profile, occasionally flooded

*Distinctive present vegetation:* Black greasewood, seepweed, shadscale, inland saltgrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Nonsodic Stumble Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

### **Ratings of the Sodic Stumble Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, soil blowing  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Nonsodic Stumble soil—VIIs, nonirrigated; sodic Stumble soil—VIIs, nonirrigated  
*Range site:* Nonsodic Stumble soil—027X009N; sodic Stumble soil—027X016N

## **4110—Fadoll loamy sand, 0 to 4 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Lake terraces  
*Elevation:* 6,800 to 7,200 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 49 degrees F  
*Frost-free season:* About 105 days

### **Composition**

*Major components:*

- Fadoll loamy sand, 0 to 4 percent slopes (Xeric Torriorthents, ashy, nonacid, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torrifluvents, loamy sand, 0 to 2 percent slopes (Xeric Torrifluvents, fine-loamy, mixed, mesic)—8 percent

- Inclusion 2: Typic Torripsamments, fine sand, 4 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—7 percent

### **Characteristics of the Fadoll Soil**

*Position on landscape:* Lake terraces

*Parent material:* Kind—water-reworked alluvium and eolian volcanic ash

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Wyoming big sagebrush, western wheatgrass, Indian ricegrass

### Typical Profile

0 to 10 inches—loamy sand; 0 to 15 percent pebbles (by weight); massive; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

10 to 35 inches—loamy sand, sand; 0 to 25 percent pebbles (by weight); massive; very hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

35 to 60 inches—very gravelly sand; 50 to 65 percent pebbles (by weight); single grained; loose; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 6 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lake plains east of Larkin Lake area

*Contrasting features:* Average of more than 18 percent clay throughout the profile, occasionally flooded

#### Inclusion 2

*Position on landscape:* Semistabilized dunes

*Contrasting features:* Less than 15 percent pebbles throughout the profile, slopes of more than 4 percent, severe hazard of wind erosion

*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Fadoll Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—piping

### Interpretive Groups

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 027X045N

## 4121—Brawley very stony fine sandy loam, 15 to 50 percent slopes

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,600 to 7,800 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 90 days

### Composition

*Major components:*

- Brawley very stony fine sandy loam, 15 to 50 percent slopes (Mollic Palexeralfs, clayey-skeletal, montmorillonitic, frigid)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Xerorthents, very gravelly sandy loam, 50 to 75 percent slopes (Typic Xerorthents)—7 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Typic Palexerolls, very gravelly loam, 4 to 15 percent slopes (Typic Palexerolls, fine, montmorillonitic, frigid)—2 percent
- Inclusion 4: Typic Fluvaquents, very stony loam, 2 to 8

percent slopes (Typic Fluvaquents, loamy-skeletal, mixed, frigid)—1 percent

### **Characteristics of the Brawley Soil**

*Position on landscape:* Crests and side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, antelope bitterbrush, pine bluegrass

*Percent of surface covered by rock fragments:* 5 percent stones

### **Typical Profile**

0 to 7 inches—very stony fine sandy loam; 15 to 30 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4  
7 to 27 inches—very gravelly clay, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; very hard, firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2  
27 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 11 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded back slopes of mountains

*Contrasting features:* No layer of clay accumulation, weathered bedrock within a depth of 10 inches, lower water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, low sagebrush

#### **Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 3**

*Position on landscape:* Crests of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Low sagebrush, Sandberg bluegrass

#### **Inclusion 4**

*Position on landscape:* Stream terraces

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded, water table at a depth of less than 24 inches

*Distinctive present vegetation:* Willow, basin wildrye, basin big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, woodland

#### **Woodland**

*Site index for common trees:* Singleleaf pinyon—39

*Most important native understory plants:* Antelope bitterbrush, mountain big sagebrush, green ephedra, pine bluegrass, needlegrass, bottlebrush squirreltail, Indian ricegrass

#### **Ratings of the Brawley Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—large stones, rooting depth

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Woodland suitability group:* 1R

### **4130—Penelas-Rodad-Gabbvally association**

#### **Map Unit Setting**

*Position on landscape:* Hills and mountains

*Elevation:* 6,000 to 7,000 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 52 degrees F  
*Frost-free season:* About 125 days

### **Composition**

#### *Major components:*

- Penelas very channery loam, 30 to 50 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—45 percent
- Rodad very gravelly loam, moist, 15 to 50 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic, shallow)—20 percent
- Gabbvally very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Rodad very gravelly sandy loam, 8 to 15 percent slopes (Typic Haplargids, loamy-skeletal, mixed, mesic, shallow)—5 percent
- Inclusion 3: Gabbvally very stony sandy loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Penelas Soil**

*Position on landscape:* Back slopes of mountains  
*Parent material:* Kind—residuum; source—shale  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

#### **Typical Profile**

- 0 to 2 inches—very channery loam; 0 to 5 percent cobbles and stones, 50 to 75 percent pebbles and channers (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2
- 2 to 5 inches—extremely shaly silty clay loam, extremely shaly clay loam; 0 to 5 percent cobbles and stones, 75 to 90 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GP-GC; estimated AASHTO classification—A-2
- 5 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 5 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Rodad Soil**

*Position on landscape:* South-facing back slopes and shoulder slopes of hills and mountains  
*Parent material:* Kind—residuum and colluvium; source—shale  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Spiny menodora, shadscale, galleta

#### **Typical Profile**

- 0 to 4 inches—very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC; estimated AASHTO classification—A-1, A-2
- 4 to 12 inches—very gravelly clay loam, very channery clay loam; 0 to 15 percent cobbles and stones, 45 to 70 percent pebbles and channers (by weight); subangular blocky structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6, A-7
- 12 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Gabbvally Soil**

*Position on landscape:* North-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta

### **Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Back slopes and toe slopes of hills

*Contrasting features:* Slopes of less than 15 percent

#### **Inclusion 3**

*Position on landscape:* Steep south-facing back slopes of mountains

*Contrasting features:* More stones on the surface

#### **Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Penelas Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Rodad Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Penelas soil—VIIIs, nonirrigated; Rodad soil—VIIIs, nonirrigated; Gabbvally soil—VIIIs, nonirrigated

*Range site:* Penelas soil—029X014N; Rodad soil—029X037N; Gabbvally soil—029X010N

## **4150—Stewval-Lomoine association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 5,800 to 7,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—75 percent

- Lomoine very gravelly sandy loam, dry, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Beelem very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—6 percent

- Inclusion 2: Gabbvally very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Xeric Torriorthents, extremely gravelly loamy sand, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Rock outcrop—1 percent

### **Characteristics of the Stewval Soil**

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff, andesite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

### **Typical Profile**

0 to 1 inch—very stony fine loam; 25 to 30 percent cobbles and stones, 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Lomoine Soil**

*Position on landscape:* Eroded side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuffs and intermediate volcanics

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Black sagebrush, Bailey greasewood, Nevada ephedra, desert needlegrass, galleta

### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

4 to 8 inches—very gravelly sandy loam, very gravelly coarse sandy loam; 0 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, GP-GM, SM, GM; estimated AASHTO classification—A-1

8 to 17 inches—weathered bedrock  
17 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* More eroded side slopes of mountains

*Slope features:* Shape—concave

*Contrasting features:* No layer of clay accumulation, slopes of more than 50 percent

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### Inclusion 2

*Position on landscape:* South-facing side slopes of mountains

*Contrasting features:* Noncalcareous throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, galleta

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Inclusion 4

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Lomoine Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Severe—droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Stewval soil—VIIIs, nonirrigated;

Lomoine soil—VIIIs, nonirrigated

*Range site:* Stewval soil—029X014N; Lomoine soil—027X061N

## 4152—Stewval-Pintwater-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 5,800 to 6,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

### Composition

*Major components:*

- Stewval very stony fine sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—40 percent

- Pintwater very cobbly fine sandy loam, 30 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—30 percent
- Rock outcrop—15 percent

**Contrasting inclusions:**

- Inclusion 1: Gabbro very gravelly sandy loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Blacktop very gravelly, fine sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
- Inclusion 3: Pintwater very gravelly fine sandy loam, 50 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
- Inclusion 4: Izo very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Stewval Soil**

**Position on landscape:** North- and east-facing side slopes of mountains

**Parent material:** Kind—residuum and colluvium; source—andesite and rhyolitic tuff

**Slope features:** Length—long; shape—convex to concave

**Dominant present vegetation:** Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

**Percent of surface covered by rock fragments:** 10 percent stones

**Typical Profile**

0 to 1 inch—very stony fine loam; 25 to 30 percent cobbles and stones, 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

**Soil and Water Features**

**Depth to hardpan:** 4 to 14 inches

**Depth to seasonal high water table:** More than 60 inches

**Frequency of flooding:** None

**Permeability:** Moderate

**Available water capacity:** Less than 1 inch

**Water-supplying capacity:** About 7 inches

**Runoff:** Rapid

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—.10; T value—1; wind erodibility group—8

**Hazard of erosion:** By water—slight; by wind—slight

**Shrink-swell potential:** Low

**Corrosivity:** Steel—moderate; concrete—low

**Potential for frost action:** Moderate

**Characteristics of the Pintwater Soil**

**Position on landscape:** Southwest-facing side slopes of mountains

**Parent material:** Kind—residuum and colluvium; source—volcanic rock

**Slope features:** Length—long; shape—convex to concave

**Dominant present vegetation:** Spiny menodora, Nevada ephedra, galleta

**Typical Profile**

0 to 3 inches—very cobbly fine sandy loam; 35 to 45 percent cobbles and stones, 35 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-1

3 to 17 inches—very gravelly fine sandy loam, very stony fine sandy loam, extremely cobbly sandy loam; 30 to 45 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

17 inches—unweathered bedrock

**Soil and Water Features**

**Depth to bedrock:** 10 to 20 inches

**Depth to seasonal high water table:** More than 60 inches

**Frequency of flooding:** None

**Permeability:** Moderately rapid

**Available water capacity:** About 1 inch

**Water-supplying capacity:** About 6 inches

**Runoff:** Rapid

**Hydrologic group:** D

**Erosion factors (surface layer):** K value—.15; T value—1; wind erodibility group—8

**Hazard of erosion:** By water—moderate; by wind—slight

*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Exposed bedrock  
*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* South-facing side slopes of mountains at higher elevations  
*Contrasting features:* Noncalcareous throughout the profile  
*Distinctive present vegetation:* Wyoming big sagebrush, galleta

#### **Inclusion 2**

*Position on landscape:* South-facing side slopes of mountains at lower elevations  
*Contrasting features:* No layer of clay accumulation, lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale

#### **Inclusion 3**

*Position on landscape:* Side slopes of mountains  
*Contrasting features:* Slopes of more than 50 percent, no layer of clay accumulation

#### **Inclusion 4**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, burrobrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Stewval Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Pintwater Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope, large stones  
*Local roads and streets:* Severe—depth to bedrock, slope, large stones  
*Roadfill:* Poor—depth to bedrock, slope, large stones  
*Sand:* Improbable source—excess fines, large stones  
*Gravel:* Improbable source—excess fines, large stones  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Interpretive Groups**

*Capability classification:* Stewval soil—VIIIs, nonirrigated; Pintwater soil—VIIIs, nonirrigated; Rock outcrop—VIIIIs  
*Range site:* Stewval soil—029X014N; Pintwater soil—029X037N

## **4153—Stewval very gravelly sandy loam, 8 to 50 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 6,000 to 7,400 feet  
*Average annual precipitation:* About 9 inches  
*Average annual air temperature:* About 51 degrees F  
*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Stewval very gravelly sandy loam, 8 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Downeyville very gravelly sandy loam, moist, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Gabbvally stony sandy loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Tejabo very stony fine sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—2 percent

### **Characteristics of the Stewval Soil**

*Position on landscape:* Crests and side slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

### Soil and Water Features

*Depth to hardpan:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Exposed bedrock

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Lower parts of south-facing back slopes of mountains

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### Inclusion 3

*Position on landscape:* Upper parts of south-facing back slopes of mountains

*Contrasting features:* Noncalcareous throughout the profile, slopes of more than 50 percent

*Distinctive present vegetation:* Wyoming big sagebrush, galleta

#### Inclusion 4

*Position on landscape:* North-facing back slopes of mountains

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, pine bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X014N

## 4154—Stewval, very steep-Stewval-Gabbvally association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,000 to 8,000 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Stewval very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—35 percent

- Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—30 percent

- Gabbvally extremely stony loamy coarse sand, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

**Contrasting inclusions:**

- Inclusion 1: Tejabe very stony sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—6 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Beelem very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—2 percent

**Characteristics of the Very Steep Stewval Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

**Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Less Sloping Stewval Soil**

*Position on landscape:* Shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

**Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Gabbvally Soil**

*Position on landscape:* South-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Wyoming big sagebrush,  
 Nevada ephedra, galleta

*Percent of surface covered by rock fragments:* 25  
 percent pebbles, 20 percent cobbles, 15 percent  
 stones

### Typical Profile

0 to 2 inches—extremely stony loamy coarse sand; 40  
 to 60 percent cobbles and stones, 40 to 70 percent  
 pebbles (by weight); subangular blocky structure;  
 soft, very friable; neutral (pH 7.2); nonsaline (less  
 than 2 mmhos/cm); nonsodic (SAR less than 2);  
 estimated Unified classification—GP-GM, GM, SP-  
 SM, SM; estimated AASHTO classification—A-1

2 to 8 inches—very gravelly sandy clay loam, very  
 gravelly sandy loam, very gravelly loam; 0 to 15  
 percent cobbles and stones, 50 to 65 percent  
 pebbles (by weight); subangular blocky structure;  
 slightly hard, very friable; mildly alkaline (pH 7.4);  
 nonsaline (less than 2 mmhos/cm); nonsodic (SAR  
 less than 2); estimated Unified classification—GM-  
 GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—  
 1; wind erodibility group—8

*Runoff:* Very rapid

*Hydrologic group:* D

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* North-facing back slopes of  
 mountains

*Contrasting features:* No layer of clay accumulation,  
 higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush,  
 pine bluegrass

#### Inclusion 2

*Position on landscape:* Scattered small peaks and  
 ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than  
 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming  
 big sagebrush

#### Inclusion 4

*Position on landscape:* Back slopes of mountains

*Contrasting features:* No layer of clay accumulation

*Distinctive present vegetation:* Utah juniper, black  
 sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Very Steep Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to  
 bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock,  
 slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Less Sloping Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to  
 bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock,  
 slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants  
 (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to  
 bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Very steep Stewval soil—VIIIs, nonirrigated; Stewval soil—VIIIs, nonirrigated; Gabbvally soil—VIIIs, nonirrigated

*Range site:* Very steep Stewval soil—029X014N; Stewval soil—029X014N; Gabbvally soil—029X010N

## **4155—Stewval-Kyler association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,200 to 8,000 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—55 percent

- Kyler very gravelly fine sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—30 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly sandy loam, 30 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Kyler very gravelly fine sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent

- Inclusion 3: Pintwater very gravelly sandy loam, 15 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

- Inclusion 4: Eaglepass very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—2 percent

### **Characteristics of the Stewval Soil**

*Position on landscape:* Crests and side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Kyler Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very

friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2  
 3 to 11 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4  
 11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* More than 6 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Back slopes of mountains  
*Contrasting features:* Bedrock at a depth of more than 20 inches

#### Inclusion 2

*Position on landscape:* Back slopes of mountains  
*Contrasting features:* Slopes of more than 50 percent

#### Inclusion 3

*Position on landscape:* South-facing back slopes of mountains at lower elevations  
*Contrasting features:* Lower water-supplying capacity, no layer of clay accumulation  
*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### Inclusion 4

*Position on landscape:* Back slopes and shoulder slopes of mountains  
*Contrasting features:* Hard bedrock within a depth of 10 inches, lower water-supplying capacity  
*Distinctive present vegetation:* Littleleaf mountainmahogany

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Kyler Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Stewval soil—VII<sub>s</sub>, nonirrigated; Kyler soil—VII<sub>s</sub>, nonirrigated  
*Range site:* Stewval soil—029X014N; Kyler soil—029X014N

### 4156—Stewval-Beelem association

#### Map Unit Setting

*Position on landscape:* Mountains  
*Elevation:* 5,800 to 7,000 feet  
*Average annual precipitation:* About 10 inches  
*Average annual air temperature:* About 52 degrees F  
*Frost-free season:* About 115 days

### Composition

*Major components:*

- Stewval very stony fine sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—65 percent
- Beelem gravelly sandy loam, 15 to 30 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Lomoino gravelly sandy loam, dry, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
- Inclusion 2: Xerollic Haplargids, gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy, mixed, mesic, shallow)—4 percent
- Inclusion 3: Zadvar very gravelly sandy loam, 2 to 8 percent slopes (Haploxerollic Durargids, loamy, mixed, mesic, shallow)—4 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Stewval Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

*Percent of surface covered by rock fragments:* 10 percent stones

**Typical Profile**

0 to 1 inch—very stony fine sandy loam; 25 to 30 percent cobbles and stones, 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Beelem Soil**

*Position on landscape:* Highly eroded back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rock

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Utah juniper, singleleaf pinyon, black sagebrush, Nevada ephedra

**Typical Profile**

0 to 1 inch—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—high; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Eroded back slopes of mountains

*Contrasting features:* No layer of clay accumulation, average of more than 35 percent rock fragments throughout the profile

#### **Inclusion 2**

*Position on landscape:* Rock pediments

*Contrasting features:* Soft bedrock within a depth of 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Fan piedmont remnants

*Contrasting features:* Cemented pan within a depth of 14 inches

#### **Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, woodland, wildlife habitat

#### **Woodland**

*Site index for common trees on the Beelem soil:* Utah juniper—30; singleleaf pinyon—30

*Most important native understory plants:* Beelem—black sagebrush, Wyoming big sagebrush, Nevada ephedra, green ephedra, Indian ricegrass, bottlebrush squirreltail

#### **Ratings of the Stewval Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Beelem Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Stewval soil—VII<sub>s</sub>, nonirrigated; Beelem soil—VII<sub>s</sub>, nonirrigated

*Range site:* Stewval soil—029X014N

*Woodland suitability group:* Beelem soil—1D

## **4157—Stewval-Bellehelen-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains and hills

*Elevation:* 6,400 to 7,600 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 110 days

### **Composition**

*Major components:*

- Stewval very gravelly fine sandy loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—45 percent
- Bellehelen very gravelly fine sandy loam, 30 to 50 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—25 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Gabbvally very stony sandy loam, moist, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Stewval very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Bellehelen very gravelly fine sandy loam, 15 to 30 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Aridic Argixerolls, stony sandy loam, 30 to 75 percent slopes (Aridic Argixerolls, loamy-skeletal, mixed, frigid)—2 percent

### **Characteristics of the Stewval Soil**

*Position on landscape:* Back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

**Typical Profile**

0 to 1 inch—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Bellehelen Soil**

*Position on landscape:* North- and east-facing back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, black sagebrush, pine bluegrass

*Percent of surface covered by rock fragments:* 40 percent pebbles, 10 percent cobbles, 2 percent stones

**Typical Profile**

0 to 2 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2);

estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 11 inches—very gravelly loam, very gravelly sandy clay loam, very gravelly clay loam; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* Less than 2 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Dominant present vegetation:* None

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Lower back slopes of mountains and hills adjacent to rock outcrop

*Contrasting features:* Noncalcareous throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush

**Inclusion 2**

*Position on landscape:* Shoulder slopes and crests of mountains

*Contrasting features:* Slopes of less than 30 percent

**Inclusion 3**

*Position on landscape:* North- and east-facing shoulder slopes of hills and mountains

*Contrasting features:* Slopes of less than 30 percent

**Inclusion 4**

*Position on landscape:* North-facing back slopes and foot slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, mountain big sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

#### Woodland

*Site index for common trees on the Bellehelen soil:*

Singleleaf pinyon—35; Utah juniper—35

*Most important native understory plants:* Bellehelen soil—black sagebrush, pine bluegrass, needlegrass, green ephedra, rabbitbrush

#### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Bellehelen Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Stewval soil—VIIs, nonirrigated; Bellehelen soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Stewval soil—029X014N

*Woodland suitability group:* Bellehelen soil—1R

## 4159—Stewval-Gabbvally-Tejabe association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 5,800 to 7,400 feet

*Average annual precipitation:* About 9 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### Composition

*Major components:*

- Stewval very stony fine sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—35 percent

- Gabbvally extremely stony loamy coarse sand, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—30 percent

- Tejabe very stony sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent

- Inclusion 2: Argalt cobbly fine sandy loam, 8 to 30 percent slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—4 percent

- Inclusion 3: Mirkwood extremely stony sandy loam, 30 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—4 percent

- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—1 percent

### Characteristics of the Stewval Soil

*Position on landscape:* Shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 1 inch—very stony fine sandy loam; 25 to 30 percent cobbles and stones, 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
4 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Gabbvally Soil

*Position on landscape:* South-facing back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—volcanic rock  
*Slope features:* Length—long; shape—concave to convex  
*Dominant present vegetation:* Wyoming big sagebrush, galleta, Nevada ephedra  
*Percent of surface covered by rock fragments:* 15 percent stones

### Typical Profile

0 to 2 inches—extremely stony loamy coarse sand; 40 to 60 percent cobbles and stones, 40 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM, SP-SM, SM; estimated AASHTO classification—A-1  
2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2  
8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Tejabe Soil

*Position on landscape:* North-facing back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Wyoming big sagebrush, pine bluegrass, spiny hopsage  
*Percent of surface covered by rock fragments:* 25 percent pebbles, 5 percent cobbles, 10 percent stones

### Typical Profile

0 to 1 inch—very stony sandy loam; 15 to 30 percent cobbles and stones, 40 to 60 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2  
1 to 9 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
9 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Summits and south-facing shoulder slopes of mountains

*Contrasting features:* Cemented pan within a depth of 20 inches

#### **Inclusion 3**

*Position on landscape:* South-facing back slopes of mountains at lower elevations

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Shadscale, desert needlegrass

#### **Inclusion 4**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

**Other inclusions (in only a few areas):** Xeric Torriorthents, clay loam, 30 to 75 percent slopes (in Red Rock Canyon area of Gabbs Valley Range)

*Position on landscape:* Eroded back slopes of hills

*Slope features:* Length—short; slope—concave

*Contrasting features:* Soft bedrock within a depth of 20 inches, no hard bedrock in the upper 40 inches

*Distinctive present vegetation:* Utah juniper, black sagebrush, littleleaf horsebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Stewval Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Tejabe Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Stewval soil—VII<sub>s</sub>, nonirrigated; Gabbvally soil—VII<sub>s</sub>, nonirrigated; Tejabe soil—VII<sub>s</sub>, nonirrigated

*Range site:* Stewval soil—029X014N; Gabbvally soil—029X010N; Tejabe soil—027X007N

## **4161—Terlco-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,700 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Terlco very gravelly fine sandy loam, 2 to 8 percent

slopes (Typic Natrargids, fine-loamy, mixed, mesic)—70 percent

- Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Luning gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—10 percent
- Inclusion 2: Gynelle very gravelly sandy loam, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Terlco Soil**

*Position on landscape:* Fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

### **Typical Profile**

0 to 2 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7

11 to 18 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Rabbitbrush, burrobrush, Nevada ephedra

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Sand sheets over inset fans

*Contrasting features:* No layer of clay accumulation, less than 35 percent rock fragments in the upper 30 inches

*Distinctive present vegetation:* Fourwing saltbush, Indian ricegrass, dalea

#### **Inclusion 2**

*Position on landscape:* Inset fans and inset fan remnants

*Contrasting features:* Lower water-supplying capacity, rarely flooded

*Distinctive present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Terlco Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Terlco soil—VIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Terlco soil—029X036N; Izo soil—029X041N

## **4162—Terlco-Annaw-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,700 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Terlco very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—50 percent

- Annaw very gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—25 percent

- Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Blacktop very gravelly sandy loam, 4 to 15 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—4 percent

- Inclusion 2: Goldyke gravelly sandy loam, 4 to 15 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—3 percent

- Inclusion 3: Belted very gravelly sand, 2 to 8 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—3 percent

### **Characteristics of the Terlco Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

### **Typical Profile**

- 0 to 4 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 4 to 17 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8);

nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7

17 to 25 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

25 to 60 inches or more—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

#### **Characteristics of the Annaw Soil**

*Position on landscape:* Inset fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

#### **Typical Profile**

0 to 2 inches—very gravelly loamy sand; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

2 to 13 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

13 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Moderately rapid

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Rabbitbrush, burrobrush, Nevada ephedra

#### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by

weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Low hills and rock pediments  
*Contrasting features:* Bedrock within a depth of 20 inches, lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale

#### Inclusion 2

*Position on landscape:* Low hills and rock pediments  
*Contrasting features:* Weathered bedrock at a depth of less than 20 inches  
*Distinctive present vegetation:* Bailey greasewood, galleta

#### Inclusion 3

*Position on landscape:* Slightly higher summits of fan piedmont remnants  
*Contrasting features:* Silica cemented layer at a depth of less than 20 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Terlco Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—large stones  
*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Ratings of the Annaw Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Izo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Terlco soil—VIIIs, nonirrigated; Annaw soil—VIIIs, nonirrigated; Izo soil—VIIw, nonirrigated  
*Range site:* Terlco soil—029X036N; Annaw soil—029X036N; Izo soil—029X041N

## 4163—Terlco-Izo association, moderately steep

### Map Unit Setting

*Position on landscape:* Fan piedmonts  
*Elevation:* 5,400 to 6,400 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### Composition

*Major components:*

- Terlco very gravelly sandy loam, 8 to 30 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—75 percent
- Izo very gravelly sand, rarely flooded, 8 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very gravelly sand, 8 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 8 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Typic Torriorthents, very gravelly loamy sand, 30 to 75 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Terlco Soil**

*Position on landscape:* Summits and side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

**Typical Profile**

0 to 2 inches—very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7

11 to 18 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

**Characteristics of the Izo Soil**

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, Indian ricegrass, galleta

**Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels at lower elevations  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Channels at higher elevations  
*Contrasting features:* No layer of clay accumulation, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Eroded side slopes of fan piedmont remnants  
*Contrasting features:* No layer of clay accumulation, slopes of more than 30 percent, lower water-supplying capacity  
*Distinctive present vegetation:* Shadscale

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Terlco Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope, large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, too sandy, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, slope

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Terlco soil—VIIIs, nonirrigated; Izo soil—VIIIs, nonirrigated

*Range site:* Terlco soil—029X036N; Izo soil—029X036N

## **4165—Terlco-Wardenot-Roic association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts over hills  
*Elevation:* 5,300 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Terlco very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—45 percent
- Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—30 percent
- Roic gravelly sandy loam, dry, 30 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Izo very stony sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Badland—3 percent

### **Characteristics of the Terlco Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

### **Typical Profile**

- 0 to 2 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7
- 11 to 18 inches—very gravelly sandy loam; 0 to 30

percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Low

### Characteristics of the Wardenot Soil

*Position on landscape:* Remnants of inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Spiny menodora, shadscale, galleta

### Typical Profile

0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—

GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Roic Soil

*Position on landscape:* Exposed hills and side slopes of fan piedmont remnants  
*Parent material:* Kind—residuum; source—Tertiary lacustrine materials  
*Slope features:* Length—very short; shape—convex  
*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### Typical Profile

0 to 2 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* No layer of clay accumulation, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Areas of exposed lacustrine sediments on summits of fan piedmont remnants  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Terlco Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

#### **Ratings of the Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Roic Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Terlco soil—VIIIs, nonirrigated; Wardenot soil—VIIIs, nonirrigated; Roic soil—VIIIs, nonirrigated

*Range site:* Terlco soil—029X036N; Wardenot soil—029X036N; Roic soil—029X033N

## **4166—Terlco, dry-Wardenot-Roic association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts over hills

*Elevation:* 5,300 to 6,000 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Terlco very gravelly fine sandy loam, dry, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—45 percent
  - Wardenot very gravelly loamy sand, dry, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—30 percent
  - Roic gravelly sandy loam, dry, 30 to 50 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Koyen gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—5 percent
  - Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
  - Inclusion 3: Badland—1 percent

### **Characteristics of the Terlco Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### Typical Profile

- 0 to 2 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; hard, friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7
- 11 to 18 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—6  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—moderate  
*Potential for frost action:* Low

### Characteristics of the Wardenot Soil

*Position on landscape:* Remnants of inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta

### Typical Profile

- 0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1
- 5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Roic Soil

*Position on landscape:* Exposed hills and side slopes of fan piedmont remnants  
*Parent material:* Kind—residuum; source—Tertiary lacustrine materials  
*Slope features:* Length—very short; shape—convex  
*Dominant present vegetation:* Indian ricegrass, shadscale, Bailey greasewood

### Typical Profile

- 0 to 2 inches—gravelly sandy loam; 0 to 5 percent

cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fanettes and broad remnants of inset fans

*Contrasting features:* No layer of clay accumulation, less than 35 percent rock fragments throughout the profile, bedrock at a depth of more than 60 inches

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, occasionally flooded, bedrock at a depth of more than 60 inches

#### Inclusion 3

*Position on landscape:* Areas of exposed lacustrine sediments on side slopes of fan piedmont remnants

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Terlco Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium

### Ratings of the Wardenot Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, large stones

### Ratings of the Roic Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Terlco soil—VIIs, nonirrigated; Wardenot soil—VIIs, nonirrigated; Roic soil—VIIs, nonirrigated

*Range site:* Terlco soil—029X017N; Wardenot soil—029X017N; Roic soil—029X033N

## 4170—Downeyville-Blacktop association

### Map Unit Setting

*Position on landscape:* Hills and mountains

*Elevation:* 4,200 to 6,000 feet

*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Downeyville very gravelly sandy loam, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—70 percent
- Blacktop very gravelly sandy loam, 30 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent
- Inclusion 2: Unsel very gravelly loam, 4 to 15 percent slopes (Duric Haplargids, fine-loamy, mixed, mesic)—3 percent
- Inclusion 3: Lithic Torriorthents, very gravelly sandy loam, 30 to 50 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent
- Inclusion 4: Izo very gravelly sand, 2 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Downeyville Soil**

*Position on landscape:* Crests and shoulder slopes of mountains, hills, and rolling hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta, Indian ricegrass

#### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-7

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Blacktop Soil**

*Position on landscape:* Back slopes of mountains, hills

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly convex to slightly concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

#### **Typical Profile**

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* North-facing back slopes of hills and mountains

*Slope features:* Shape—concave

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Bailey greasewood, shadscale, Sandberg bluegrass

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Toe slopes of hills

*Contrasting features:* Bedrock at a depth of more than 60 inches, horizon of silica cementation

#### **Other inclusions (in only a few areas)**

- Silverbow soils, South of Miller Mountain adjacent to the Esmeralda County line
- Gabbvally very gravelly sandy loam, moist, 30 to 50 percent slopes, in Indian Head Peak area

*Position on landscape:* Higher north slopes

*Distinctive present vegetation:* Wyoming big sagebrush, bottlebrush squirreltail, Nevada ephedra, galleta, Sandberg bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Downeyville Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Blacktop Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Downeyville soil—VIIIs, nonirrigated; Blacktop soil—VIIIs, nonirrigated

*Range site:* Downeyville soil—029X022N; Blacktop soil—029X033N

## **4171—Downeyville-Hawsley association**

### **Map Unit Setting**

*Position on landscape:* Hills and adjacent sand sheets

*Elevation:* 4,400 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Downeyville loamy sand, overblown, 8 to 15 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—55 percent
  - Hawsley sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—40 percent
- Contrasting inclusions:*
- Inclusion 1: Downeyville very gravelly sandy loam, 15 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
  - Inclusion 2: Isolde fine sand loam, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—1 percent
  - Inclusion 3: Rock outcrop—1 percent

### **Characteristics of the Downeyville Soil**

*Position on landscape:* Side slopes of hills with sand sheets

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Indian ricegrass, fourwing saltbush, Nevada ephedra

### **Typical Profile**

0 to 3 inches—loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); single grained; loose; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 to 10 inches—very gravelly loam, very gravelly fine

sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2

10 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Hawsley Soil

*Position on landscape:* Sand sheets over mountain-valley fans, toe slopes of hills

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood, Nevada dalea, fourwing saltbush

### Typical Profile

0 to 8 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of hills

*Contrasting features:* Slopes of more than 15 percent, no sandy surface layer

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 2

*Position on landscape:* Dunes

*Contrasting features:* More erosive, dominantly fine sand throughout the profile

*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

#### Inclusion 3

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Downeyville Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, soil blowing

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Hawsley Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, piping

### Interpretive Groups

*Capability classification:* Downeyville soil—VIIs, nonirrigated; Hawsley soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Downeyville soil—027X009N; Hawsley soil—027X009N

## 4173—Downeyville-Stewval-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,000 to 7,500 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

### Composition

*Major components:*

- Downeyville very gravelly sandy loam, moist, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—45 percent
- Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—30 percent
- Rock outcrop—10 percent

*Contrasting inclusions:*

- Inclusion 1: Stewval very gravelly sandy loam, 4 to 15 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Izo very gravelly sand, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Blacktop very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—3 percent

### Characteristics of the Downeyville Soil

*Position on landscape:* South-, east-, and west-facing side slopes of mountains at lower elevations

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Galleta, spiny menodora, Nevada ephedra

### Typical Profile

0 to 4 inches—very gravelly sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-7

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Stewval Soil

*Position on landscape:* North slopes of mountains at lower elevations and side slopes of mountains at upper elevations

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Crests and shoulder slopes of mountains at upper elevations

*Contrasting features:* Slopes of less than 15 percent

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* Steep south-facing eroded side slopes

*Contrasting features:* Lower water-supplying capacity, slopes of more than 50 percent

*Distinctive present vegetation:* Shadscale

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Downeyville Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Downeyville soil—VIIs,

nonirrigated; Stewval soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Downeyville soil—029X037N; Stewval soil—029X014N

## 4174—Downeyville-Stewval-Mirkwood association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 5,400 to 6,700 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 125 days

### Composition

#### Major components:

- Downeyville very stony fine sandy loam, moist, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—50 percent
- Stewval very stony fine sandy loam, 15 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—25 percent
- Mirkwood very stony sandy loam, 30 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—10 percent

#### Contrasting inclusions:

- Inclusion 1: Tejabé very stony sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—7 percent
- Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Terlco very gravelly sandy loam, 2 to 15 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—3 percent
- Inclusion 4: Rock outcrop—2 percent

#### Characteristics of the Downeyville Soil

*Position on landscape:* Crests and south- and west-facing shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

#### Typical Profile

0 to 4 inches—very stony sandy loam; 30 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### Characteristics of the Stewval Soil

*Position on landscape:* North- and east-facing shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

*Percent of surface covered by rock fragments:* 5 percent stones

#### Typical Profile

0 to 1 inch—very stony fine sandy loam; 20 to 30 percent cobbles and stones, 45 to 60 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Mirkwood Soil**

*Position on landscape:* Steep south- and west-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Desert needlegrass, shadscale, littleleaf horsebrush

*Percent of surface covered by rock fragments:* 5 percent stones

### **Typical Profile**

0 to 2 inches—very stony sandy loam; 15 to 25 percent cobbles and stones, 35 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-4, A-2

2 to 11 inches—very gravelly loam, very gravelly clay loam; 5 to 15 percent cobbles and stones, 45 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing back slopes of mountains

*Slope features:* Length—long; shape—slightly concave

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### **Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### **Inclusion 3**

*Position on landscape:* Fan piedmont remnants and toe slopes of hills

*Contrasting features:* Bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### **Inclusion 4**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Downeyville Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Ratings of the Stewval Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Mirkwood Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Downeyville soil—VII<sub>s</sub>, nonirrigated; Stewval soil—VII<sub>s</sub>, nonirrigated; Mirkwood soil—VII<sub>s</sub>, nonirrigated

*Range site:* Downeyville soil—029X037N; Stewval soil—029X014N; Mirkwood soil—027X017N

### **4175—Downeyville, moist-Downeyville-Blacktop association**

#### **Map Unit Setting**

*Position on landscape:* Hills and mountains

*Elevation:* 5,000 to 6,600 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

#### **Composition**

*Major components:*

- Downeyville very stony fine sandy loam, moist, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—50 percent
- Downeyville very stony fine sandy loam, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—20 percent
- Blacktop very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, very stony sandy loam, 30 to 75 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—5 percent

- Inclusion 2: Terlco very gravelly sandy loam, 4 to 15 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—4 percent

- Inclusion 3: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Rock outcrop—3 percent

#### **Characteristics of the Moist Downeyville Soil**

*Position on landscape:* Crests and south- and west-facing shoulder slopes of mountains and hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, galleta

*Percent of surface covered by rock fragments:* 10 percent stones

#### **Typical Profile**

0 to 4 inches—very stony fine sandy loam; 30 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Downeyville Soil**

*Position on landscape:* North- and east-facing back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Shadscale, galleta, Indian ricegrass

*Percent of surface covered by rock fragments:* 10 percent stones

**Typical Profile**

0 to 4 inches—very stony fine sandy loam; 30 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Characteristics of the Blacktop Soil**

*Position on landscape:* Steep south- and west-facing back slopes of mountains and hills

*Parent material:* Kind—colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave to slightly convex

*Dominant present vegetation:* Shadscale, galleta, Indian ricegrass

**Typical Profile**

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

7 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* North- and east-facing back slopes of hills and mountains

*Slope features:* Shape—slightly concave

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

**Inclusion 2**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded,

*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Inclusion 3**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

**Inclusion 4**

*Position on landscape:* Fan piedmont remnants and toe slopes of mountains and hills

*Contrasting features:* Bedrock at a depth of more than 60 inches

**Other inclusions (in only a few areas):** Old Camp very stony sandy loam, 30 to 75 percent slopes (Lithic Xerollic Haplargids—loamy-skeletal, mixed, mesic)

**Position on landscape:** Higher north-facing mountain back slopes in the northern part of the survey area

**Contrasting features:** Higher water-supplying capacity

**Distinctive present vegetation:** Wyoming big sagebrush, Sandberg bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Moist Downeyville Soil for Various Uses

**Wildlife habitat elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Range seeding:** Poor—too arid, droughty, large stones

**Shallow excavations:** Severe—depth to bedrock, slope

**Local roads and streets:** Severe—depth to bedrock, slope

**Roadfill:** Poor—depth to bedrock

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Embankments, dikes, and levees:** Severe—thin layer, large stones

### Ratings of the Downeyville Soil for Various Uses

**Wildlife habitat elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Range seeding:** Poor—too arid, droughty, large stones

**Shallow excavations:** Severe—depth to bedrock, slope

**Local roads and streets:** Severe—depth to bedrock, slope

**Roadfill:** Poor—depth to bedrock, slope

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Embankments, dikes, and levees:** Severe—thin layer

### Ratings of the Blacktop Soil for Various Uses

**Wildlife habitat elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Range seeding:** Poor—too arid, droughty, small stones

**Shallow excavations:** Severe—depth to bedrock, slope

**Local roads and streets:** Severe—depth to bedrock, slope

**Roadfill:** Poor—depth to bedrock, slope

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Embankments, dikes, and levees:** Severe—thin layer

### Interpretive Groups

**Capability classification:** Moist Downeyville soil—VII<sub>s</sub>, nonirrigated; Downeyville soil—VII<sub>s</sub>, nonirrigated; Blacktop soil—VII<sub>s</sub>, nonirrigated

**Range site:** Moist Downeyville soil—029X037N; Downeyville soil—029X022N; Blacktop soil—029X033N

## 4176—Downeyville, moist-Downeyville-Gabbvally association

### Map Unit Setting

**Position on landscape:** Hills and mountains

**Elevation:** 5,400 to 6,800 feet

**Average annual precipitation:** About 8 inches

**Average annual air temperature:** About 52 degrees F

**Frost-free season:** About 125 days

### Composition

**Major components:**

- Downeyville very gravelly fine sandy loam, moist, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—30 percent
- Downeyville very gravelly sandy loam, 30 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—30 percent
- Gabbvally very stony loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—25 percent

**Contrasting inclusions:**

- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Truhoy very gravelly fine sandy loam, 8 to 30 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—5 percent
- Inclusion 3: Stewal very gravelly sandy loam, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—1 percent

### Characteristics of the Moist Downeyville Soil

**Position on landscape:** Crests and shoulder slopes of mountains and hills

**Parent material:** Kind—residuum and colluvium; source—volcanic rock

**Slope features:** Length—long; shape—convex

**Dominant present vegetation:** Spiny menodora, shadscale, galleta

### Typical Profile

0 to 4 inches—very gravelly fine sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2

mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Downeyville Soil**

*Position on landscape:* South-, east-, and west-facing back slopes of mountains and hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta, Indian ricegrass

#### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline

(pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Gabbvally Soil**

*Position on landscape:* Predominantly north-facing back slopes of hills and mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta

*Percent of surface covered by rock fragments:* 5 percent stones

#### **Typical Profile**

0 to 2 inches—very stony loam; 10 to 40 percent cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Toe slopes of mountains and hills  
*Contrasting features:* Bedrock at a depth of more than 60 inches, cemented pan within a depth of 14 inches

#### Inclusion 3

*Position on landscape:* Highest crests and shoulder slopes of hills and mountains  
*Contrasting features:* Higher water-supplying capacity, calcareous throughout the profile  
*Distinctive present vegetation:* Black sagebrush, galleta, Sandberg bluegrass

#### Inclusion 4

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Basin big sagebrush, spiny hopsage, Sandberg bluegrass

**Other inclusions (in only a few areas):** Small areas of Old Camp stony loam, 50 to 75 percent slopes

*Position on landscape:* North-facing back slopes of hills and mountains adjacent to Churchill County

*Slope features:* Shape—concave  
*Contrasting features:* Cooler soil temperature  
*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Moist Downeyville Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope, depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Downeyville Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope, depth to bedrock  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Moist Downeyville soil—VII<sub>1</sub>, nonirrigated; Downeyville soil—VII<sub>2</sub>, nonirrigated; Gabbvally soil—VII<sub>3</sub>, nonirrigated  
*Range site:* Moist Downeyville soil—029X037N; Downeyville soil—029X022N; Gabbvally soil—029X010N

## 4177—Downeyville-Mirkwood-Nemico association

### Map Unit Setting

*Position on landscape:* Mountains  
*Elevation:* 5,400 to 6,200 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Downeyville very stony fine sandy loam, 30 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—50 percent

- Mirkwood extremely stony sandy loam, 30 to 75 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

- Nemico very stony fine sandy loam, 2 to 15 percent slopes (Typic Nadurargids, clayey, montmorillonitic, mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Annaw very gravelly sandy loam, 4 to 8 percent slopes (Typic Camborthids, loamy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 3: Veet very gravelly sandy loam, 4 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—3 percent

- Inclusion 4: Rock outcrop—3 percent

### **Characteristics of the Downeyville Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, galleta, Indian ricegrass

*Percent of surface covered by rock fragments:* 5 percent stones

### **Typical Profile**

0 to 4 inches—very stony fine loam; 30 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified

classification—GC; estimated AASHTO

classification—A-2, A-6

9 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—

1; wind erodibility group—7

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Mirkwood Soil**

*Position on landscape:* South-facing back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Desert needlegrass, shadscale, littleleaf horsebrush

*Percent of surface covered by rock fragments:* 15 percent stones

### **Typical Profile**

0 to 2 inches—extremely stony sandy loam; 40 to 50 percent cobbles and stones, 60 to 75 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-1, A-2

2 to 11 inches—very gravelly loam, very gravelly clay loam; 5 to 15 percent cobbles and stones, 45 to 60 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, SC; estimated AASHTO classification—A-2

11 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Nemico Soil**

*Position on landscape:* Summits of buttes  
*Parent material:* Kind—residuum and colluvium; source—basalt  
*Slope features:* Length—short; shape—concave to convex  
*Dominant present vegetation:* Galleta, shadscale, Bailey greasewood  
*Percent of surface covered by rock fragments:* 15 percent pebbles, 20 percent cobbles, 3 percent stones

### **Typical Profile**

0 to 2 inches—very stony fine sandy loam; 10 to 25 percent cobbles and stones, 15 to 35 percent pebbles (by weight); platy structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 2 to 15 inches—gravelly clay loam, gravelly clay; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; hard, friable; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); moderately sodic to strongly sodic (SAR 30 to 60); estimated Unified classification—SC, CL, CH; estimated AASHTO classification—A-7  
 15 to 16 inches—indurated duripan  
 16 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to hardpan:* 10 to 20 inches  
*Depth to bedrock:* 11 to 25 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium

*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Alluvial fans  
*Contrasting features:* Bedrock at a depth of more than 60 inches, no layer of clay accumulation, rarely flooded

#### **Inclusion 2**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, sandy textures, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Fan collars  
*Contrasting features:* Bedrock at a depth of more than 60 inches, higher water-supplying capacity, rarely flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

#### **Inclusion 4**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

**Other inclusions (in only a few areas):** Tejabe very stony sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)

*Position on landscape:* North-facing back slopes of mountains  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Downeyville Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, large stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope, depth to bedrock  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer, large stones

#### **Ratings of the Mirkwood Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Nemico Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, cemented pan

*Local roads and streets:* Severe—depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Downeyville soil—VIIs, nonirrigated; Mirkwood soil—VIIs, nonirrigated; Nemico soil—VIIs, nonirrigated

*Range site:* Downeyville soil—029X022N; Mirkwood soil—027X017N; Nemico soil—027X015N

### **4178—Downeyville-Stewval-Blacktop association**

#### **Map Unit Setting**

*Position on landscape:* Hills and mountains

*Elevation:* 5,700 to 6,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

#### **Composition**

*Major components:*

- Downeyville very gravelly sandy loam, 15 to 50 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—40 percent

- Stewval very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—35 percent
- Blacktop very gravelly sandy loam, 30 to 75 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent
- Inclusion 2: Stewval very gravelly sandy loam, 4 to 15 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—6 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

#### **Characteristics of the Downeyville Soil**

*Position on landscape:* South-, east-, and west-facing back slopes and shoulder slopes of mountains and hills

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Bailey greasewood, shadscale, galleta, Indian ricegrass

#### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2

4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

9 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 6 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Stewval Soil**

*Position on landscape:* Back slopes and shoulder slopes of hills and mountains at higher elevations and north-facing back slopes at lower elevations  
*Parent material:* Kind—residuum and colluvium; source—andesite and rhyolitic tuff  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

### **Typical Profile**

0 to 1 inch—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
 1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 4 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Blacktop Soil**

*Position on landscape:* Back slopes of mountains and hills at lower elevations  
*Parent material:* Kind—residuum and colluvium; source—volcanic rock  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass

### **Typical Profile**

0 to 7 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1  
 7 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 10 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Crests of hills and mountains, rock pediments at higher elevations  
*Contrasting features:* Slopes of less than 15 percent

#### **Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of greater than 20 inches, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Downeyville Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### Ratings of the Blacktop Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Downeyville soil—VII<sub>s</sub>, nonirrigated; Stewval soil—VII<sub>s</sub>, nonirrigated; Blacktop soil—VII<sub>s</sub>, nonirrigated

*Range site:* Downeyville soil—029X022N; Stewval soil—029X014N; Blacktop soil—029X033N

## 4180—Candelaria-Izo association

### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 6,200 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Candelaria very gravelly sandy loam, 4 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—65 percent

- Izo very gravelly sand, rarely flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, very gravelly loamy sand, 30 to 75 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Izo very gravelly sand, occasionally flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent

- Inclusion 3: Rock outcrop—1 percent

- Inclusion 4: Badland—1 percent

### Characteristics of the Candelaria Soil

*Position on landscape:* Summits and side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Indian ricegrass, spiny hopsage, galleta

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately

saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Indian ricegrass, spiny hopsage, galleta

### Typical Profile

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Eroded back slopes of fan piedmont remnants

*Slope features:* Length—very short; shape—slightly concave

*Contrasting features:* Slopes of more than 30 percent, lower water-supplying capacity

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, no layer of lime accumulation throughout the profile

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* Scattered small peaks on back slopes of fan piedmont remnants

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 4

*Position on landscape:* Scattered areas of exposed lacustrine sediments on back slopes of fan piedmont remnants

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Candelaria Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Candelaria soil—VIIs,

nonirrigated; Izo soil—VIIs, nonirrigated

*Range site:* Candelaria soil—029X036N; Izo soil—029X036N

## **4181—Candelaria-Wardenot-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

• Candelaria very gravelly sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—50 percent

• Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—30 percent

• Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

• Inclusion 1: Gynelle very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent

• Inclusion 2: Typic Torriorthents, very gravelly loamy sand, 15 to 50 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

• Inclusion 3: Terlco very gravelly sandy loam, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—2 percent

### **Characteristics of the Candelaria Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, Indian ricegrass, galleta

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Characteristics of the Wardenot Soil**

*Position on landscape:* Remnants of inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta, Indian ricegrass

### **Typical Profile**

0 to 5 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1  
 5 to 60 inches—stratified very gravelly fine sandy loam to extremely cobbly loamy sand; 10 to 40 percent cobbles and stones, 55 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Rubber rabbitbrush, burrobrush, littleleaf horsebrush, Indian ricegrass

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1  
 8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans and fan skirts at lower elevations  
*Contrasting features:* Lower water-supplying capacity, rarely flooded  
*Distinctive present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry

#### **Inclusion 2**

*Position on landscape:* Eroded side slopes of fan piedmont remnants  
*Contrasting features:* Slopes of more than 15 percent

**Inclusion 3**

*Position on landscape:* Higher summits of fan piedmont remnants

*Contrasting features:* Layer of clay accumulation, SAR greater than 13

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Candelaria Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

**Ratings of the Wardenot Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, large stones

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, large stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Candelaria soil—VIIs, nonirrigated; Wardenot soil—VIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Candelaria soil—029X036N; Wardenot soil—029X036N; Izo soil—029X041N

**4182—Candelaria-Gynelle-Izo association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,500 to 5,300 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 140 days

**Composition**

*Major components:*

- Candelaria very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—50 percent

- Gynelle very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—30 percent

- Izo extremely gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Candelaria very gravelly sandy loam, dry, 8 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Typic Torriorthents, very gravelly loamy sand, 15 to 50 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

**Characteristics of the Candelaria Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, bud sagebrush, galleta, Indian ricegrass

**Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

#### **Characteristics of the Gynelle Soil**

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, Cooper wolfberry, Bailey greasewood, Indian ricegrass

#### **Typical Profile**

0 to 2 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

2 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 65 percent pebbles (by

weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to hardpan:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Rubber rabbitbrush, burrobrush, littleleaf horsebrush, Indian ricegrass

#### **Typical Profile**

0 to 8 inches—extremely gravelly loamy sand; 0 to 15 percent cobbles and stones, 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Shoulder slopes and back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

#### **Inclusion 2**

*Position on landscape:* Back slopes of fan piedmont remnants

*Slope features:* Length—very short; shape—concave

*Contrasting features:* Slopes of more than 15 percent, lower water-supplying capacity

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Candelaria Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

#### **Ratings of the Gynelle Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, large stones

*Roadfill:* Fair—large stones

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Candelaria soil—VIIIs, nonirrigated; Gynelle soil—VIIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Candelaria soil—029X017N; Gynelle soil—027X043N; Izo soil—029X041N

## **4183—Candelaria-Izo, rarely flooded, association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Candelaria very gravelly fine sandy loam, 8 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—75 percent
- Izo very gravelly sand, rarely flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Candelaria very stony fine sandy loam, 4 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—8 percent
- Inclusion 2: Typic Torriorthents, very gravelly loamy sand, 30 to 75 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Izo extremely gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Candelaria Soil**

*Position on landscape:* Summits and side slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth to convex  
*Dominant present vegetation:* Shadscale, Bailey  
 greasewood, bud sagebrush, galleta, Indian  
 ricegrass

*Percent of surface covered by rock fragments:* 65  
 percent pebbles, 10 percent cobbles, 1 percent  
 stones

### Typical Profile

- 0 to 1 inch—very gravelly fine sandy loam; 0 to 15  
 percent cobbles and stones, 55 to 70 percent  
 pebbles (by weight); platy structure; slightly hard,  
 very friable; strongly alkaline (pH 8.6); nonsaline  
 (less than 4 mmhos/cm); nonsodic (SAR less than  
 6); estimated Unified classification—GM; estimated  
 AASHTO classification—A-1
- 1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent  
 cobbles and stones, 25 to 35 percent pebbles (by  
 weight); platy structure; slightly hard, very friable;  
 strongly alkaline (pH 8.7); nonsaline (less than 4  
 mmhos/cm); nonsodic (SAR less than 6); estimated  
 Unified classification—SM; estimated AASHTO  
 classification—A-2
- 4 to 16 inches—very gravelly sandy loam, very gravelly  
 loamy sand, extremely gravelly sandy loam; 0 to 10  
 percent cobbles and stones, 55 to 80 percent  
 pebbles (by weight); platy structure; slightly hard,  
 very friable; strongly alkaline (pH 8.7); moderately  
 saline to strongly saline (more than 8 mmhos/cm);  
 nonsodic (SAR less than 6); estimated Unified  
 classification—GM; estimated AASHTO  
 classification—A-1
- 16 to 60 inches—stratified extremely gravelly sand to  
 very gravelly loamy coarse sand; 0 to 10 percent  
 cobbles and stones, 65 to 80 percent pebbles (by  
 weight); single grained; loose; strongly alkaline (pH  
 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic  
 (SAR less than 13); estimated Unified  
 classification—GP-GM, GP; estimated AASHTO  
 classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—  
 5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Remnants of inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Spiny menodora,  
 shadscale, bud sagebrush, Indian ricegrass, galleta

### Typical Profile

- 0 to 8 inches—very gravelly sand; 0 to 15 percent  
 cobbles and stones, 50 to 70 percent pebbles (by  
 weight); single grained; loose; moderately alkaline  
 (pH 8.4); nonsaline (less than 2 mmhos/cm);  
 nonsodic (SAR less than 2); estimated Unified  
 classification—GM, GP-GM, SM, SP-SM; estimated  
 AASHTO classification—A-1
- 8 to 60 inches—stratified gravelly loamy coarse sand to  
 extremely gravelly coarse sand; 0 to 15 percent  
 cobbles and stones, 65 to 85 percent pebbles (by  
 weight); single grained; loose; nonsaline (less than  
 4 mmhos/cm); nonsodic (SAR less than 2);  
 estimated Unified classification—GP, GP-GM;  
 estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—  
 5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Fan piedmont remnants at upper  
 elevations  
*Contrasting features:* Higher water-supplying capacity,  
 layer of lime accumulation at a depth of 1 to 6  
 inches  
*Distinctive present vegetation:* Spiny menodora, galleta

**Inclusion 2**

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 30 percent, lower water-supplying capacity

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Candelaria Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

**Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Candelaria soil—VIIs, nonirrigated; Izo soil—VIIs, nonirrigated

*Range site:* Candelaria soil—029X017N; Izo soil—029X036N

**4184—Candelaria, dry-Izo association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,900 to 5,800 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 140 days

**Composition**

*Major components:*

- Candelaria very gravelly fine sandy loam, dry, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—75 percent

- Izo extremely gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Gynelle very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Candelaria very gravelly fine sandy loam, dry, 8 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Candelaria cobbly fine sandy loam, dry, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—3 percent

**Characteristics of the Candelaria Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, bud sagebrush, galleta, Indian ricegrass, Cooper wolfberry

**Typical Profile**

0 to 1 inch—very gravelly fine sandy loam; 0 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Rubber rabbitbrush, burrobrush, littleleaf horsebrush, Nevada ephedra

### Typical Profile

0 to 8 inches—extremely gravelly loamy sand; 0 to 15 percent cobbles and stones, 75 to 90 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of inset fans  
*Contrasting features:* No silica or lime cementation, rarely flooded

*Distinctive present vegetation:* Cooper wolfberry, shadscale, Indian ricegrass

#### Inclusion 2

*Position on landscape:* Shoulder slopes and back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

#### Inclusion 3

*Position on landscape:* Summits of fan piedmont remnants

*Contrasting features:* Cobbly surface

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Candelaria Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

### Ratings of the Izo Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Candelaria soil—VIIs, nonirrigated; Izo soil—VIIw, nonirrigated  
*Range site:* Candelaria soil—029X017N; Izo soil—029X041N

## **4185—Candelaria-Typic Torriorthents association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts with sand sheets  
*Elevation:* 5,200 to 5,700 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 135 days

### **Composition**

*Major components:*

- Candelaria gravelly loamy sand, 4 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—65 percent
  - Typic Torriorthents, gravelly loamy sand, 30 to 50 percent slopes (Typic Torriorthents)—20 percent
- Contrasting inclusions:*
- Inclusion 1: Sundown loamy sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—7 percent
  - Inclusion 2: Typic Torriorthents, very gravelly loamy sand, 30 to 75 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent
  - Inclusion 3: Candelaria very gravelly fine sandy loam, dry, 4 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—3 percent
  - Inclusion 4: Candelaria gravelly loamy sand, overblown, 2 to 4 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—1 percent

### **Characteristics of the Candelaria Soil**

*Position on landscape:* Summits of fan piedmont remnants with sand sheets  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—convex  
*Dominant present vegetation:* Littleleaf horsebrush, Indian ricegrass, Cooper wolfberry, Nevada dalea

### **Typical Profile**

- 0 to 4 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand; 0 to 10 percent cobbles and stones, 60 to 75 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—moderate; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Characteristics of the Typic Torriorthents**

*Position on landscape:* Back slopes of fan piedmont remnants with sand sheets  
*Parent material:* Mixed alluvium  
*Slope features:* Length—very short; shape—slightly concave  
*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, littleleaf horsebrush

### **Reference Profile**

0 to 6 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); platy structure; soft, very

friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Sand sheets over channels and toe slopes of fan piedmont remnants

*Contrasting features:* Less than 15 percent rock fragments throughout the profile, no layer of lime accumulation at a depth of 1 to 6 inches

#### Inclusion 2

*Position on landscape:* Back slopes of fan piedmont remnants without sand sheets

*Contrasting features:* More than 35 percent rock fragments throughout the profile, slopes of more than 50 percent, more than 35 percent rock fragments on the surface, sandy textures throughout the profile

*Distinctive present vegetation:* Shadscale

#### Inclusion 3

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants without sand sheets

*Contrasting features:* Very gravelly sandy loam surface

*Distinctive present vegetation:* Bailey greasewood, shadscale, galleta

#### Inclusion 4

*Position on landscape:* Lower summits of fan piedmont remnants

*Contrasting features:* Slopes of less than 4 percent

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Candelaria Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

### Ratings of the Typic Torriorthents for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* Candelaria soil—VII, nonirrigated; Typic Torriorthents—VIIe, nonirrigated

*Range site:* Candelaria soil—027X060N; Typic Torriorthents—027X060N

## 4186—Candelaria-Roic-Izo association

### Map Unit Setting

*Position on landscape:* Fan piedmonts over hills

*Elevation:* 6,000 to 6,600 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### Composition

*Major components:*

- Candelaria very gravelly fine sandy loam, 8 to 30

percent slopes (Typic Calciorrhids, sandy-skeletal, mixed, mesic)—40 percent

- Roic gravelly sandy loam, dry, 8 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—30 percent

- Izo very gravelly sand, rarely flooded, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Candelaria very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Calciorrhids, sandy-skeletal, mixed, mesic)—6 percent

- Inclusion 2: Izo extremely gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 3: Xeric Torriorthents, gravelly sandy loam, 4 to 30 percent slopes (Xeric Torriorthents, loamy, mixed, mesic, shallow)—3 percent

- Inclusion 4: Typic Torriorthents, gravelly sandy loam, 30 to 50 percent slopes (Typic Torriorthents, loamy, mixed, mesic, shallow)—2 percent

### **Characteristics of the Candelaria Soil**

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—convex to concave

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta

### **Typical Profile**

0 to 1 inch—very gravelly fine sandy loam; 0 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately

saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Roic Soil**

*Position on landscape:* Shoulder slopes and back slopes of fan piedmont remnants

*Parent material:* Kind—residuum; source—sedimentary rock

*Slope features:* Length—very short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 50 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-

ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Characteristics of the Izo Soil

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta, Indian ricegrass

### Typical Profile

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GP-GM, SM, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy coarse sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Summits of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

#### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### Inclusion 3

*Position on landscape:* Back slopes of fan piedmont remnants

*Slope features:* Length—very short; shape—concave

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Black sagebrush, Nevada ephedra, galleta

#### Inclusion 4

*Position on landscape:* Slopes adjacent to exposed hills

*Slope features:* Length—very short; shape—convex

*Contrasting features:* Soft bedrock within a depth of 20 inches, slopes of more than 30 percent

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Candelaria Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

#### Ratings of the Roic Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

#### **Interpretive Groups**

*Capability classification:* Candelaria soil—VIIIs, nonirrigated; Roic soil—VIIIs, nonirrigated; Izo soil—VIIIs, nonirrigated  
*Range site:* Candelaria soil—029X036N; Roic soil—029X033N; Izo soil—029X036N

### **4188—Candelaria-Downeyville-Annaw association**

#### **Map Unit Setting**

*Position on landscape:* Fan piedmonts and rock pediments  
*Elevation:* 5,400 to 6,000 feet  
*Average annual precipitation:* About 6 inches  
*Average annual air temperature:* About 53 degrees F  
*Frost-free season:* About 130 days

#### **Composition**

*Major components:*

- Candelaria very gravelly sandy loam, 2 to 8 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—35 percent
- Downeyville very gravelly fine sandy loam, moist, 8 to 30 percent slopes (Lithic Haplargids, loamy-skeletal, mixed, mesic)—30 percent
- Annaw gravelly sandy loam, 2 to 8 percent slopes (Typic Camborthids, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Pintwater gravelly sandy loam, 8 to 30 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—6 percent
- Inclusion 2: Candelaria very gravelly sandy loam, 8 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Rock outcrop—1 percent

#### **Characteristics of the Candelaria Soil**

*Position on landscape:* Summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta

#### **Typical Profile**

- 0 to 1 inch—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Characteristics of the Downeyville Soil**

*Position on landscape:* Rock pediments  
*Parent material:* Kind—residuum; source—volcanic rock  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta

### **Typical Profile**

0 to 4 inches—very gravelly fine sandy loam; 5 to 20 percent cobbles and stones, 45 to 70 percent pebbles (by weight); platy structure; hard, friable; moderately alkaline (pH 8.4); nonsodic (SAR less than 6); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-1, A-2  
 4 to 9 inches—very gravelly loam, very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsodic (SAR less than 13); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6  
 9 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Characteristics of the Annaw Soil**

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta, Indian ricegrass

### **Typical Profile**

0 to 2 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 2 to 11 inches—gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam; 0 to 15 percent cobbles and stones, 25 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2  
 11 to 60 inches or more—stratified extremely gravelly loamy coarse sand to very gravelly sandy loam; 0 to 25 percent cobbles and stones, 55 to 80 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 6 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Side slopes of fan piedmont remnants with exhumed hills  
*Contrasting features:* Hard bedrock within a depth of 20 inches, no horizon of clay accumulation

**Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent, bedrock at a depth of more than 60 inches

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush

**Inclusion 4**

*Position on landscape:* Scattered small peaks of rock pediments

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Candelaria Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess salt

**Ratings of the Downeyville Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, soil blowing

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Annaw Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, soil blowing, droughty

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Candelaria soil—VIIIs, nonirrigated; Downeyville soil—VIIIs, nonirrigated; Annaw soil—VIIIs, nonirrigated

*Range site:* Candelaria soil—029X036N; Downeyville soil—029X037N; Annaw soil—029X036N

**4189—Candelaria-Typic Torriorthents, very steep, association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,400 to 6,000 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

**Composition**

*Major components:*

- Candelaria very gravelly sandy loam, 15 to 30 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—45 percent

- Typic Torriorthents, very gravelly loamy sand, 50 to 75 percent slopes (Typic Torriorthents)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Wardenot very gravelly loamy sand, moist, 4 to 15 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—7 percent

- Inclusion 2: Izo very gravelly sand, 4 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

- Inclusion 3: Belted very gravelly loam, moist, 4 to 15 percent slopes (Haplic Durargids, loamy, mixed, mesic, shallow)—3 percent

- Inclusion 4: Candelaria very gravelly sandy loam, 30 to 50 percent slopes (Typic Calciorthids, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Candelaria Soil**

*Position on landscape:* Summits, shoulder slopes, and back slopes of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta

**Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4

mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 4 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 35 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2

4 to 16 inches—very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 80 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.7); moderately saline to strongly saline (more than 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1

16 to 60 inches—stratified extremely gravelly sand to very gravelly loamy coarse sand; 0 to 10 percent cobbles and stones, 65 to 80 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.7); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GP-GM, GP; estimated AASHTO classification—A-1

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

#### Characteristics of the Typic Torriorthents

*Position on landscape:* Back slopes of eroded fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—concave

*Dominant present vegetation:* Shadscale, Bailey greasewood

#### Reference Profile

0 to 6 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

#### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Remnants of inset fans and toe slopes of fan piedmont remnants

*Contrasting features:* Rarely flooded, no horizon of lime accumulation

##### Inclusion 2

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

##### Inclusion 3

*Position on landscape:* Summits and shoulder slopes of fan piedmont remnants at upper elevations

*Contrasting features:* Cemented pan in the upper 20 inches, layer of clay accumulation

##### Inclusion 4

*Position on landscape:* Back slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 50 percent,

layer of lime accumulation at a depth of 1 to 6 inches

**Other inclusions (in only a few areas):** Xerollic Haplargids, very gravelly sandy loam, 15 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)

**Position on landscape:** North- and east-facing shoulder slopes of fan piedmont remnants at upper elevations

**Contrasting features:** Layer of clay accumulation, higher water-supplying capacity

**Distinctive present vegetation:** Black sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Candelaria Soil for Various Uses**

**Wildlife habitat elements:** Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

**Range seeding:** Poor—too arid, small stones, excess salt

**Shallow excavations:** Severe—cutbanks cave

**Local roads and streets:** Severe—slope

**Roadfill:** Fair—slope

**Sand:** Probable source

**Gravel:** Probable source

**Embankments, dikes, and levees:** Severe—seepage, excess salt

### **Ratings of the Typic Torriorthents for Various Uses**

**Wildlife habitat elements:** Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

**Range seeding:** Poor—too arid, small stones

**Shallow excavations:** Severe—cutbanks cave, slope

**Local roads and streets:** Severe—slope

**Roadfill:** Poor—slope

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Embankments, dikes, and levees:** Severe—seepage

### **Interpretive Groups**

**Capability classification:** Candelaria soil—VII<sub>s</sub>, nonirrigated; Typic Torriorthents—VII<sub>s</sub>, nonirrigated

**Range site:** Candelaria soil—027X036N; Typic Torriorthents—027X033N

## **4190—Brier-Beelem-Wassit association**

### **Map Unit Setting**

**Position on landscape:** Mountains

**Elevation:** 6,800 to 8,400 feet

**Average annual precipitation:** About 12 inches

**Average annual air temperature:** About 50 degrees F

**Frost-free season:** About 100 days

### **Composition**

**Major components:**

- Brier very stony loam, 30 to 50 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—45 percent
- Beelem very gravelly sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed [calcareous], mesic)—25 percent

- Wassit very gravelly sandy loam, 15 to 50 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—15 percent

**Contrasting inclusions:**

- Inclusion 1: Loomer very gravelly sandy loam, 30 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, mesic)—7 percent

- Inclusion 2: Xerollic Haplargids, very stony loam, 15 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 15 to 50 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Brier Soil**

**Position on landscape:** Back slopes of mountains

**Parent material:** Kind—residuum and colluvium; source—volcanic rock

**Slope features:** Length—long; shape—convex to concave

**Dominant present vegetation:** Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

**Percent of surface covered by rock fragments:** 10 percent stones

### **Typical Profile**

0 to 4 inches—very stony loam; 30 to 50 percent cobbles and stones, 40 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2, A-4

4 to 15 inches—very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam; 30 to 45 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Beelem Soil

*Position on landscape:* Steeper eroded back slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rock  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush, black sagebrush, Nevada ephedra, green ephedra

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 3 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 9 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Wassit Soil

*Position on landscape:* Back slopes of mountains at upper elevations  
*Parent material:* Kind—residuum and colluvium; source—volcanic rock  
*Slope features:* Length—long; shape—convex to concave  
*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, pine bluegrass

### Typical Profile

0 to 6 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2  
 6 to 12 inches—very gravelly loam, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 12 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—6  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing back slopes of mountains

*Contrasting features:* Clayey textures below 10 inches

*Distinctive present vegetation:* Low sagebrush, Sandberg bluegrass

#### **Inclusion 2**

*Position on landscape:* Toe slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 20 inches

*Distinctive present vegetation:* Wyoming big sagebrush, Sandberg bluegrass

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Occasionally flooded, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### **Woodland**

*Site index for common trees on the Brier and Beelem soils:* Singleleaf pinyon—30; Utah juniper—30

*Site index for common trees on the Wassit soil:* Singleleaf pinyon—39

*Most important native understory plants:* Brier—Wyoming big sagebrush, mountain big sagebrush, green ephedra, pine bluegrass, bottlebrush squirreltail; Beelem—black sagebrush, Wyoming big sagebrush, Nevada ephedra, green ephedra, Indian ricegrass, bottlebrush squirreltail; Wassit—antelope bitterbrush, mountain big sagebrush, green ephedra, pine bluegrass, needlegrass, bottlebrush squirreltail, Indian ricegrass

#### **Ratings of the Brier Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### **Ratings of the Beelem Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Wassit Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Brier soil—VIIs, nonirrigated; Beelem soil—VIIs, nonirrigated; Wassit soil—VIIs, nonirrigated

*Woodland suitability group:* Brier soil—1R; Beelem soil—1R; Wassit soil—1R

## **4191—Brier-Brawley-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,600 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

- Brier very stony loam, 30 to 75 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—40 percent
- Brawley very stony fine sandy loam, 30 to 50 percent

slopes (Mollic Palexerafts, clayey-skeletal, montmorillonitic, frigid)—30 percent

- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, gravelly loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy, mixed, mesic, shallow)—7 percent
- Inclusion 2: Fluvaquentic Haplaquolls, extremely stony sandy loam, 2 to 8 percent slopes (Fluvaquentic Haplaquolls, loamy-skeletal, mixed, mesic)—6 percent
- Inclusion 3: Katyblay very stony fine sandy loam, 30 to 50 percent slopes (Andeptic Cryoborolls, loamy-skeletal, mixed)—2 percent

### **Characteristics of the Brier Soil**

*Position on landscape:* Back slopes of mountains at lower elevations and south- and west-facing back slopes of mountains at higher elevations

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 4 inches—very stony loam; 30 to 50 percent cobbles and stones, 40 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2, A-4

4 to 15 inches—very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam; 30 to 45 percent cobbles and stones, 35 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Brawley Soil**

*Position on landscape:* Back slopes of mountains at higher elevations and north-facing back slopes of mountains at lower elevations

*Parent material:* Kind—residuum and colluvium; source—altered volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, low sagebrush, pine bluegrass

*Percent of surface covered by rock fragments:* 5 percent stones

### **Typical Profile**

0 to 7 inches—very stony fine sandy loam; 15 to 30 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2, A-4

7 to 27 inches—very gravelly clay, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC, GM; estimated AASHTO classification—A-2

27 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 20 to 30 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Water-supplying capacity:* About 3 inches

*Available water capacity:* About 11 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Eroded back slopes at lower elevations

*Slope features:* Length—short; shape—convex

*Contrasting features:* No layer of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

#### **Inclusion 2**

*Position on landscape:* Stream banks

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Willow, rose, basin big sagebrush

#### **Inclusion 3**

*Position on landscape:* North-facing back slopes of mountains at higher elevations

*Slope features:* Shape—concave

*Contrasting features:* Bedrock at a depth of more than 60 inches, colder average soil temperature, higher water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, needlegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### **Woodland**

*Site index for common trees on the Brier soil:* Singleleaf pinyon—30; Utah juniper—30

*Site index for common trees on the Brawley soil:* Singleleaf pinyon—38

*Most important native understory plants:* Brier—Wyoming big sagebrush, mountain big sagebrush, green ephedra, pine bluegrass, bottlebrush squirreltail; Brawley—antelope bitterbrush, mountain big sagebrush, pine bluegrass, needlegrass, bottlebrush squirreltail, Indian ricegrass

### **Ratings of the Brier Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Ratings of the Brawley Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; coniferous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—large stones, rooting depth

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Brier soil—VIIs, nonirrigated; Brawley soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Woodland suitability group:* Brier soil—1R; Brawley soil—1R

## **4192—Brier-Katyblay-Hiridge association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,400 to 8,400 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

### **Composition**

*Major components:*

- Brier very stony loam, 30 to 75 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—45 percent
- Katyblay fine sandy loam, 30 to 75 percent slopes (Andeptic Cryoboralfs, loamy-skeletal, mixed)—25 percent

- Hiridge very gravelly sandy loam, 8 to 30 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Nire stony sandy loam, 30 to 50 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal over clayey, mixed)—7 percent

- Inclusion 2: Rock outcrop—2 percent
- Inclusion 3: Typic Cryoboralfs, very stony fine sandy loam, 30 to 50 percent slopes (Typic Cryoboralfs)—1 percent

### **Characteristics of the Brier Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 4 inches—very stony loam; 30 to 50 percent cobbles and stones, 40 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2, A-4

4 to 15 inches—very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam; 30 to 45 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Katyblay Soil**

*Position on landscape:* North-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium;

source—altered volcanic rock with a mantle of eolian volcanic ash

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, western needlegrass, snowberry, basin wildrye

### **Typical Profile**

0 to 16 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-5

16 to 33 inches—gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

33 to 60 inches—very gravelly sandy clay loam, very gravelly loam; 0 to 10 percent cobbles and stones, 45 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC, SC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 16 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—moderate

*Potential for frost action:* Moderate

### **Characteristics of the Hiridge Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rocks

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum

**Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* South- and west-facing back slopes of mountains

*Slope features:* Length—long; shape—concave

*Contrasting features:* Bedrock at a depth of more than 60 inches, thick dark surface layer

*Distinctive present vegetation:* Mountain big sagebrush, antelope bitterbrush

**Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

**Inclusion 3**

*Position on landscape:* North-facing back slopes of mountains at higher elevations

*Slope features:* Length—short; shape—slightly concave

*Contrasting features:* Colder average soil temperature, higher water-supplying capacity

*Distinctive present vegetation:* Limber pine

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Woodland**

*Site index for common trees on the Brier soil:* Singleleaf pinyon—30; Utah juniper—30

*Most important native understory plants:* Brier—Wyoming big sagebrush, mountain big sagebrush, green ephedra, pine bluegrass, bottlebrush squirreltail

**Ratings of the Brier Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

**Ratings of the Katyblay Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—erodes easily

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Slight

**Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Brier soil—VIIs, nonirrigated; Katyblay soil—VIIe, nonirrigated; Hiridge soil—VIIs, nonirrigated

*Range site:* Katyblay soil—026X038N; Hiridge soil—026X028N

*Woodland suitability group:* Brier soil—1R

## 4200—Sonoma silt loam

### Map Unit Setting

*Position on landscape:* Lake plains

*Elevation:* 4,000 to 4,100 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

### Composition

*Major components:*

- Sonoma silt loam, 0 to 2 percent slopes (Aeric Fluvaquents, fine-silty, mixed [calcareous], mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Aeric Fluvaquents, silt loam, 0 to 2 percent slopes (Aeric Fluvaquents, fine, mixed, mesic)—5 percent
- Inclusion 2: Nuyobe silty clay loam, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—3 percent
- Inclusion 3: Sagouspe loamy fine sand, frequently flooded, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—2 percent

### Characteristics of the Sonoma Soil

*Position on landscape:* Lake plains

*Parent material:* Mixed alluvium and lacustrine sediments

*Slope features:* Length—short; shape—smooth

*Dominant present vegetation:* Meadow barley, inland saltgrass, alkali sacaton, rush, rabbitfootgrass

### Typical Profile

- 0 to 6 inches—silt loam; massive; slightly hard, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—ML, CL-ML; estimated AASHTO classification—A-4
- 6 to 44 inches—silt loam, silty clay loam; massive; hard, friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 5); estimated Unified classification—CL, ML; estimated AASHTO classification—A-6, A-7
- 44 to 60 inches or more—stratified coarse sand to silt loam; massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—SM; estimated AASHTO classification—A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 18 to 36 inches (January to April)

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 24 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.55; T value—5; wind erodibility group—4L

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lake plains

*Contrasting features:* More than 35 percent clay throughout the profile

#### Inclusion 2

*Position on landscape:* Slightly lower lake plains

*Slope features:* Length—short; shape—slightly concave

*Contrasting features:* Strongly sodic in the upper 20 inches

*Distinctive present vegetation:* Inland saltgrass, black greasewood

#### Inclusion 3

*Position on landscape:* Flood plains adjacent to Walker River

*Slope features:* Length—short; shape—smooth

*Contrasting features:* Sandy textures throughout the profile

*Distinctive present vegetation:* Tamarisk

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Sonoma Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—very poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—good; shallow water areas—fair

*Range seeding:* Good

*Shallow excavations:* Severe—wetness, cutbanks cave

*Local roads and streets:* Severe—frost action, low strength

*Roadfill:* Fair—wetness

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—wetness

### **Interpretive Groups**

*Capability classification:* Vw, irrigated and nonirrigated

*Range site:* 029X002N

## **4210—Sagouspe sand, frequently flooded, 0 to 2 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Flood plains

*Elevation:* 4,000 to 4,100 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

### **Composition**

*Major components:*

- Sagouspe sand, frequently flooded, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Aquic Xerofluvents, sand, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—7 percent

- Inclusion 2: Aquic Xeropsammets, sand, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—4 percent

- Inclusion 3: Sagouspe sand, drained, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—3 percent

- Inclusions 4: Sonoma silt loam, 0 to 2 percent slopes (Aeric Fluvaquents, fine-silty, mixed [calcareous], mesic)—1 percent

### **Characteristics of the Sagouspe Soil**

*Position on landscape:* Flood plains

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth to slightly concave

*Dominant present vegetation:* Rush, inland saltgrass, alkali sacaton, rabbitfootgrass

### **Typical Profile**

0 to 11 inches—sand; single grained; loose; strongly alkaline (pH 8.8); nonsaline (less than 4 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified

classification—SM; estimated AASHTO classification—A-2

11 to 60 inches—stratified coarse sand to silt loam; massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* 36 to 60 inches (June to October)

*Flooding:* Frequency—frequent; duration—brief; months—May to September

*Permeability:* Rapid (percolation impeded throughout the profile by thin silt loam strata in most pedons)

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Isolated mounds on flood plains

*Slope features:* Length—very short; shape—slightly convex

*Contrasting features:* Rarely flooded

*Distinctive present vegetation:* Inland saltgrass, rubber rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Relict stream channels

*Contrasting features:* Sandy in all subhorizons

#### **Inclusion 3**

*Position on landscape:* Beach terraces

*Contrasting features:* Water table at a depth of more than 60 inches

*Distinctive present vegetation:* Russian-thistle, rabbitbrush, inland saltgrass

#### **Inclusion 4**

*Position on landscape:* Small basin fill areas

*Slope features:* Shape—concave

*Contrasting features:* Silty textures throughout the profile

*Distinctive present vegetation:* Wiregrass, inland saltgrass, alkali sacaton, rabbitfootgrass

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Sagouspe Soil for Various Uses

**Wildlife habitat elements:** Grain and seed crops

(irrigated)—fair; domestic grasses and legumes

(irrigated)—fair; wild herbaceous plants

(nonirrigated)—good; shrubs (nonirrigated)—good;

wetland plants—fair; shallow water areas—fair

**Range seeding:** Poor—too arid, droughty, excess sodium

**Shallow excavations:** Severe—cutbanks cave

**Local roads and streets:** Severe—flooding

**Roadfill:** Good

**Sand:** Improbable source—excess fines

**Gravel:** Improbable source—excess fines

**Embankments, dikes, and levees:** Severe—piping, seepage

### Interpretive Groups

**Capability classification:** IIIw, irrigated, and VIIw, nonirrigated

**Range site:** 029X002N

## 4211—Sagouspe sand, drained, 0 to 2 percent slopes

### Map Unit Setting

**Position on landscape:** Flood plains

**Elevation:** 4,000 to 4,100 feet

**Average annual precipitation:** About 5 inches

**Average annual air temperature:** About 53 degrees F

**Frost-free season:** About 140 days

### Composition

**Major components:**

- Sagouspe sand, drained, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—90 percent

**Contrasting inclusions:**

- Inclusion 1: Typic Torriorthents, sand, 0 to 2 percent slopes (Typic Torriorthents, sandy or sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Sagouspe sand, frequently flooded, 0 to 2 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—3 percent

### Characteristics of the Sagouspe Soil

**Position on landscape:** Relict flood plains

**Parent material:** Mixed alluvium

**Slope features:** Length—long; shape—smooth

**Dominant present vegetation:** Tamarisk, western wheatgrass, inland saltgrass, rubber rabbitbrush, Russian-thistle

### Typical Profile

0 to 11 inches—sand; massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

11 to 60 inches—stratified coarse sand to silt loam; massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

### Soil and Water Features

**Depth to bedrock:** More than 60 inches

**Depth to seasonal high water table:** More than 60 inches

**Frequency of flooding:** None

**Permeability:** Rapid (percolation impeded throughout the profile by thin silt loam strata in most pedons)

**Available water capacity:** About 5 inches

**Water-supplying capacity:** About 5 inches

**Runoff:** Very slow

**Hydrologic group:** B

**Erosion factors (surface layer):** K value—.15; T value—5; wind erodibility group—1

**Hazard of erosion:** By water—slight; by wind—very severe

**Shrink-swell potential:** Low

**Corrosivity:** Steel—high; concrete—low

**Potential for frost action:** Low

### Contrasting Inclusions

#### Inclusion 1

**Position on landscape:** Relict stream channels

**Contrasting features:** Lower water-supplying capacity, more than 15 percent rock fragments throughout the profile

**Distinctive present vegetation:** Rubber rabbitbrush, Russian-thistle

#### Inclusion 2

**Position on landscape:** Active flood plains adjacent to Walker River

**Contrasting features:** Frequently flooded, water table at a depth of less than 60 inches

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Sagoupe Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, seepage

#### **Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 027X002N

### **4212—Sagoupe sand, dry, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Alluvial plains

*Elevation:* 4,020 to 4,060 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

#### **Composition**

*Major components:*

- Sagoupe sand, dry, 0 to 4 percent slopes (Aquic Xerofluvents, sandy, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torrifluvents, sand, 0 to 4 percent slopes (Typic Torrifluvents, sandy over loamy, mixed, mesic)—10 percent
- Inclusion 2: Typic Torripsamments, sand, 0 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent
- Inclusion 3: Typic Torrifluvents, loamy sand, 2 to 4 percent slopes (Typic Torrifluvents, fine-silty, mixed, nonacid, mesic)—1 percent

#### **Characteristics of the Sagoupe Soil**

*Position on landscape:* Alluvial plains

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—undulating

*Dominant present vegetation:* Rubber rabbitbrush, inland saltgrass, Russian-thistle, Indian ricegrass, fourwing saltbush, wiregrass

#### **Typical Profile**

0 to 11 inches—sand; massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

11 to 60 inches—stratified coarse sand to silt loam; massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid (percolation impeded throughout the profile by thin silt loam strata in most pedons)

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Alluvial plains

*Slope features:* Length—long; shape—undulating

*Contrasting features:* Thicker contrasting silty horizon in the profile

##### **Inclusion 2**

*Position on landscape:* Remnant beaches

*Contrasting features:* Sandy throughout the profile

##### **Inclusion 3**

*Position on landscape:* Channels cut into alluvial plains

*Contrasting features:* Finer textures throughout the profile, occasionally flooded

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

#### **Ratings of the Sagouspe Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, too sandy, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, seepage

#### **Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 027X016N

### **4220—Patna-Hawsley sands, 0 to 4 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Lake-plain terraces

*Elevation:* 4,100 to 4,200 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

#### **Composition**

*Major components:*

- Patna sand, 0 to 2 percent slopes (Typic Haplargids, coarse-loamy, mixed, mesic)—45 percent
- Hawsley sand, 0 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Playas—5 percent
- Inclusion 2: Typic Haplargids, sand, 0 to 2 percent slopes (Typic Haplargids, fine-loamy, mixed, mesic)—4 percent
- Inclusion 3: Isolde fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—3 percent
- Inclusion 4: Badland—3 percent

#### **Characteristics of the Patna Soil**

*Position on landscape:* Lake-plain terraces

*Parent material:* Eolian material and sandy lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bailey greasewood, shadscale, bud sagebrush, Indian ricegrass

#### **Typical Profile**

0 to 8 inches—sand; 0 to 5 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

8 to 15 inches—sandy loam, coarse sandy loam, fine sandy loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

15 to 36 inches—sand, loamy sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

36 to 60 inches—loamy sand, fine sand, loamy fine sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Hawsley Soil**

*Position on landscape:* Sand sheets over lake-plain terraces

*Parent material:* Kind—water-reworked alluvium and

olian material; source—various kinds of rock  
*Slope features:* Shape—smooth to slightly convex  
*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood, Nevada dalea

### Typical Profile

0 to 8 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Small sink areas on lake-plain terraces  
*Contrasting features:* Ponded for brief periods  
*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Adjacent lake-plain terraces  
*Contrasting features:* Fine sand throughout the profile

#### Inclusion 3

*Position on landscape:* Stabilized dunes

*Slope features:* Shape—convex to concave  
*Contrasting features:* Slopes of more than 4 percent, fine sand throughout the profile  
*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass, fourwing saltbush

### Inclusion 4

*Position on landscape:* Exposed areas of Tertiary lacustrine sediments  
*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Patna Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—thin layer

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage, piping, excess sodium

### Ratings of the Hawsley Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, soil blowing

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage, piping

### Interpretive Groups

*Capability classification:* Patna soil—IIIs, irrigated, and VIIs, nonirrigated; Hawsley soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Patna soil—027X018N; Hawsley soil—027X009N

**4221—Patna sand, 0 to 2 percent slopes****Map Unit Setting**

*Position on landscape:* Lake-plain terraces

*Elevation:* 4,100 to 4,300 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

**Composition**

*Major components:*

- Patna sand, 0 to 2 percent slopes (Typic Haplargids, coarse-loamy, mixed, mesic)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Luning loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—5 percent
- Inclusion 2: Typic Torriorthents, gravelly sandy loam, 0 to 2 percent slopes (Typic Torriorthents, coarse-loamy, mixed, nonacid, mesic)—3 percent
- Inclusion 3: Bluewing very gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—1 percent
- Inclusion 4: Playas—1 percent

**Characteristics of the Patna Soil**

*Position on landscape:* Lake-plain terraces

*Parent material:* Eolian material and sandy lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bailey greasewood, shadscale, bud sagebrush, Indian ricegrass

**Typical Profile**

0 to 8 inches—sand; 0 to 5 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

8 to 15 inches—sandy loam, coarse sandy loam, fine sandy loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-4

15 to 36 inches—sand, loamy sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2

36 to 60 inches—loamy sand, fine sand, loamy fine

sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Fan skirts above beach terraces

*Contrasting features:* No horizon of clay accumulation

**Inclusion 2**

*Position on landscape:* Fan skirts above beach terraces

*Contrasting features:* No horizon of clay accumulation

*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* More than 35 percent rock fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Burrobrush, rabbitbrush

**Inclusion 4**

*Position on landscape:* Small sink areas on large lake-plain terraces

*Contrasting features:* Pondered for brief periods

*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

**Ratings of the Patna Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—thin layer

*Gravel:* Improbable source—too sandy

*Embankments, dikes, and levees:* Severe—seepage, piping, excess sodium

### **Interpretive Groups**

*Capability classification:* IIIs, irrigated, and VIIs, nonirrigated

*Range site:* 027X018N

## **4230—Typic Torriorthents-Patna-Badland association**

### **Map Unit Setting**

*Position on landscape:* Lake-plain terraces

*Elevation:* 4,100 to 4,300 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

### **Composition**

*Major components:*

- Typic Torriorthents, gravelly loamy sand, 2 to 15 percent slopes (Typic Torriorthents)—55 percent
- Patna sand, 0 to 2 percent slopes (Typic Haplargids, coarse-loamy, mixed, mesic)—20 percent
- Badland—10 percent

*Contrasting inclusions:*

- Inclusion 1: Barnmot silty clay loam, 8 to 30 percent slopes (Typic Torriorthents, fine, montmorillonitic [calcareous], mesic)—6 percent
- Inclusion 2: Hawsley sand, 2 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent
- Inclusion 3: Nuyobe silty clay loam, 0 to 2 percent slopes (Aeric Halaquepts, fine-silty, mixed [calcareous], mesic)—4 percent
- Inclusion 4: Typic Haplargids, sandy loam, 0 to 2 percent slopes (Typic Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—1 percent

### **Characteristics of the Typic Torriorthents**

*Position on landscape:* Alluvial fans over lake-plain terraces

*Parent material:* Mixed alluvium over lacustrine sediments

*Slope features:* Length—short; shape—smooth to slightly convex

*Dominant present vegetation:* Bailey greasewood, shadscale, Cooper wolfberry

### **Reference Profile**

0 to 6 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Patna Soil**

*Position on landscape:* Slightly higher lake-plain terraces

*Parent material:* Eolian material and sandy lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bailey greasewood, shadscale, bud sagebrush, Indian ricegrass

### **Typical Profile**

0 to 8 inches—sand; 0 to 5 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

8 to 15 inches—sandy loam, coarse sandy loam, fine

sandy loam; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2, A-4

15 to 36 inches—sand, loamy sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 9.0); nonsaline (less than 4 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

36 to 60 inches—loamy sand, fine sand, loamy fine sand; 0 to 5 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); moderately sodic (SAR 30 to 46); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—1

*Hazard of erosion:* By water—slight; by wind—very severe

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### Characteristics of the Badland

*Position on landscape:* Exposed semiconsolidated lacustrine sediments

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of lake-plain terraces

*Contrasting features:* Slopes of more than 8 percent, clayey at a depth of more than 6 inches

#### Inclusion 2

*Position on landscape:* Sand sheets

*Slope features:* Shape—smooth to slightly convex

*Contrasting features:* Sandy throughout the profile, no layer of clay accumulation

*Distinctive present vegetation:* Indian ricegrass, littleleaf horsebrush, Nevada dalea

#### Inclusion 3

*Position on landscape:* Lake plains

*Slope features:* Length—very short; shape—smooth (adjacent to Weber Reservoir)

*Contrasting features:* In spring, high water table at a depth of 24 to 36 inches

*Distinctive present vegetation:* Inland saltgrass, alkali sacaton, black greasewood

#### Inclusion 4

*Position on landscape:* Highest summits of lake-plain terraces

*Contrasting features:* Horizon of higher clay content in upper part of the profile

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Typic Torriorthents for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Patna Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor;

wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, piping, excess sodium

### Interpretive Groups

*Capability classification:* Typic Torriorthents—VII<sub>s</sub>, nonirrigated; Patna soil—III<sub>s</sub>, irrigated, and VII<sub>s</sub>, nonirrigated; Badland—VIII<sub>s</sub>

*Range site:* Typic Torriorthents—027X043N; Patna soil—027X018N

## 4240—Typic Torriorthents, 2 to 4 percent slopes

### Map Unit Setting

*Position on landscape:* Lake-plain terraces

*Elevation:* 4,100 to 4,400 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 140 days

### Composition

*Major components:*

- Typic Torriorthents, gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Torriorthents, gravelly loamy sand, 8 to 15 percent slopes (Typic Torriorthents)—5 percent
- Inclusion 2: Bluewing very gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Badland—2 percent

### Characteristics of the Typic Torriorthents

*Position on landscape:* Lake-plain terraces

*Parent material:* Mixed alluvium and lacustrine sediments

*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Bailey greasewood, Cooper wolfberry, Indian ricegrass

### Reference Profile

0 to 6 inches—gravelly loamy sand; 25 to 50 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 60 inches—stratified silt loam to very gravelly sand; 0 to 10 percent cobbles and stones, 35 to 65 percent pebbles (by weight); massive; slightly hard, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM, SM-SC, GM, GM-GC; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate to rapid

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of lake-plain terraces

*Contrasting features:* Slopes of more than 8 percent

#### Inclusion 2

*Position on landscape:* Channels

*Slope features:* Length—short; shape—smooth

*Contrasting features:* More than 35 percent rock fragments throughout the profile, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, burrobrush, Indian ricegrass

#### Inclusion 3

*Position on landscape:* Areas of exposed semiconsolidated lacustrine sediments along side slopes of terraces

*Distinctive present vegetation:* None

**Other inclusions (in only a few areas):** Typic Torriorthents

*Position on landscape:* Lake-plain terraces south of Calico Hills

*Contrasting features:* More than 35 percent cobbles on the surface

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Typic Torriorthents for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Slight

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

### Interpretive Groups

*Capability classification:* VIIs, nonirrigated

*Range site:* 029X043N

## 4250—Bango-Hawsley complex, 0 to 4 percent slopes

### Map Unit Setting

*Position on landscape:* Lake-plain terraces

*Elevation:* 4,000 to 4,300 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

### Composition

*Major components:*

- Bango sandy loam, 0 to 2 percent slopes (Typic Haplargids, fine-loamy, mixed, mesic)—60 percent
- Hawsley sand, 0 to 4 percent slopes (Typic Torripsamments, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Patna sand, 2 to 8 percent slopes (Typic Haplargids, coarse-loamy, mixed, mesic)—6 percent
- Inclusion 2: Isolde fine sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent
- Inclusion 3: Typic Torriorthents, gravelly loamy sand, 8 to 50 percent slopes (Typic Torriorthents)—3 percent
- Inclusion 4: Playas—2 percent

### Characteristics of the Bango Soil

*Position on landscape:* Lake-plain terraces

*Parent material:* Mixed alluvium over lacustrine sediments

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry, Indian ricegrass

*Percent of surface covered by rock fragments:* 10 percent pebbles

### Typical Profile

0 to 6 inches—sandy loam; 0 to 5 percent cobbles and stones, 5 to 10 percent pebbles (by weight); platy structure; slightly hard, very friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 12 inches—sandy clay loam, loam; 0 to 5 percent cobbles and stones, 0 to 10 percent pebbles (by weight); subangular blocky structure; hard, friable; moderately alkaline (pH 8.4); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CL; estimated AASHTO classification—A-6

12 to 60 inches—stratified gravelly loamy coarse sand to silty clay loam; 0 to 5 percent cobbles and

stones, 5 to 15 percent pebbles (by weight); massive; slightly hard, friable; strongly alkaline (pH 8.6); slightly saline to moderately saline (4 to 16 mmhos/cm); strongly sodic (SAR greater than 46); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-6, A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 9 inches

*Water-supplying capacity:* About 5 inches

*Runoff:* Very slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

### Characteristics of the Hawsley Soil

*Position on landscape:* Sand sheets over lake-plain terraces

*Parent material:* Kind—water-reworked alluvium and eolian material; source—various kinds of rock

*Slope features:* Length—short; shape—slightly convex to smooth

*Dominant present vegetation:* Indian ricegrass, littleleaf horsebrush, Bailey greasewood, Nevada dalea

### Typical Profile

0 to 8 inches—sand; 0 to 10 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, SP-SM; estimated AASHTO classification—A-2, A-3

8 to 42 inches—stratified fine sand to coarse sand; 0 to 25 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

42 to 60 inches or more—fine sand; single grained; loose; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-2, A-3

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—1  
*Hazard of erosion:* By water—slight; by wind—very severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Lake-plain terraces, near south edge of terrace  
*Contrasting features:* Sandy below horizon of clay accumulation

**Inclusion 2**

*Position on landscape:* Semistabilized dunes  
*Contrasting features:* Dominantly fine sand throughout the profile  
*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

**Inclusion 3**

*Position on landscape:* Side slopes of lake-plain terraces  
*Contrasting features:* Slopes of more than 8 percent, no layer of clay accumulation  
*Distinctive present vegetation:* Shadscale, Bailey greasewood

**Inclusion 4**

*Position on landscape:* Small sink areas  
*Contrasting features:* Ponded for short periods of time  
*Distinctive present vegetation:* None  
**Other inclusions (in only a few areas):** Badland  
*Position on landscape:* Small areas of exposed semiconsolidated lacustrine sediments  
*Contrasting features:* Highly erosive  
*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

**Ratings of the Bango Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Slight  
*Local roads and streets:* Moderate—shrink-swell  
*Roadfill:* Fair—shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—piping, excess sodium

**Ratings of the Hawsley Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor; wetland plants—very poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Improbable source—too sandy  
*Embankments, dikes, and levees:* Severe—seepage, piping

**Interpretive Groups**

*Capability classification:* Bango soil—VIIs, nonirrigated; Hawsley soil—VIIs, irrigated, and IVs, nonirrigated  
*Range site:* Bango soil—027X043N; Hawsley soil—027X009N

**5010—Mopana-Nire association****Map Unit Setting**

*Position on landscape:* Plateaus  
*Elevation:* 7,600 to 7,900 feet  
*Average annual precipitation:* About 13 inches  
*Average annual air temperature:* About 46 degrees F  
*Frost-free season:* About 85 days

**Composition***Major components:*

- Mopana stony fine sandy loam, 2 to 8 percent slopes (Abruptic Aridic Durixerolls, clayey, montmorillonitic, frigid, shallow)—60 percent
- Nire stony fine sandy loam, 4 to 15 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal, mixed)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent

### **Characteristics of the Mopana Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum and colluvium;  
source—basalt

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, bottlebrush squirreltail

*Percent of surface covered by rock fragments:* 15 percent pebbles, 5 percent cobbles, 2 percent stones

#### **Typical Profile**

0 to 4 inches—stony fine sandy loam; 10 to 15 percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-4

4 to 8 inches—loam; 0 to 10 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

8 to 19 inches—clay, gravelly clay loam; 0 to 10 percent cobbles and stones, 0 to 40 percent pebbles (by weight); prismatic structure parting to angular blocky; very hard, very firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL, CH, SC; estimated AASHTO classification—A-7

19 to 60 inches—indurated duripan

#### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Very slow

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Slow

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.24; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Nire Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rock and eolian volcanic ash

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, antelope bitterbrush, western needlegrass, basin wildrye

*Percent of surface covered by rock fragments:* 3 percent stones

#### **Typical Profile**

0 to 15 inches—stony fine sandy loam; 10 to 30 percent cobbles and stones, 10 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

15 to 39 inches—very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam; 25 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2

39 to 60 inches—cobbley clay; 15 to 30 percent cobbles and stones, 10 to 30 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 14 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Mopana Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—rooting depth

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan, shrink-swell, low strength

*Roadfill:* Poor—cemented pan, shrink-swell, low strength

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Nire Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good

*Range seeding:* Fair—large stones

*Shallow excavations:* Moderate—too clayey, large stones, slope

*Local roads and streets:* Moderate—slope, frost action, large stones

*Roadfill:* Fair—large stones, thin layer

*Sand:* Improbable source—excess fines

*Sand:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Interpretive Groups**

*Capability classification:* Mopana soil—VIIs, nonirrigated; Nire soil—VIIs, nonirrigated

*Range site:* Mopana soil—026X028N; Nire soil—026X005N

## **5011—Mopana-Holtle Variant association**

### **Map Unit Setting**

*Position on landscape:* Plateaus

*Elevation:* 7,400 to 8,200 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Mopana very stony sandy loam, 4 to 15 percent slopes (Abruptic Aridic Durixerolls, clayey, montmorillonitic, frigid, shallow)—50 percent

- Holtle Variant sandy loam, 2 to 8 percent slopes (Aridic Duric Haploxerolls, coarse-loamy, mixed, frigid)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Durixerolls, very stony sandy loam, 8 to 30 percent slopes (Typic Durixerolls, clayey-skeletal, montmorillonitic, frigid)—7 percent

- Inclusion 2: Borealis very stony fine sandy loam, 4 to 30 percent slopes (Abruptic Durixerolls, fine, mixed, frigid)—5 percent

- Inclusion 3: Rock outcrop—3 percent

### **Characteristics of the Mopana Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum; source—basalt with additions of eolian volcanic ash

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, Sandberg bluegrass, bottlebrush squirreltail

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 4 inches—stony fine sandy loam; 25 to 40 percent cobbles and stones, 10 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2, A-4

4 to 8 inches—loam; 0 to 10 percent cobbles and stones, 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL, CL-ML; estimated AASHTO classification—A-4, A-6

8 to 19 inches—clay, gravelly clay loam; 0 to 10 percent cobbles and stones, 0 to 40 percent pebbles (by weight); prismatic structure parting to angular blocky; very hard, very firm; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—CL, CH, SC; estimated AASHTO classification—A-7

19 to 60 inches—indurated duripan

**Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Slow  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Hottle Variant**

*Position on landscape:* Intraplateau basins on plateau tops  
*Parent material:* Mixed alluvium and eolian material high in volcanic ash  
*Slope features:* Length—short; shape—concave  
*Dominant present vegetation:* Mountain big sagebrush, bottlebrush squirreltail

**Typical Profile**

0 to 13 inches—sandy loam; 0 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 13 to 50 inches—sandy loam; 0 to 25 percent pebbles (by weight); massive; very hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 50 to 60 inches—strongly cemented duripan

**Soil and Water Features**

*Depth to hardpan:* 40 to 60 inches  
*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 7 inches  
*Water-supplying capacity:* About 14 inches  
*Runoff:* Slow  
*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—3; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Summits of plateaus adjacent to rock outcrop  
*Slope features:* Length—short; shape—concave  
*Contrasting features:* Cemented pan at a depth of more than 20 inches, more than 35 percent rock fragments throughout the profile  
*Distinctive present vegetation:* Mountain big sagebrush, antelope bitterbrush, western needlegrass

**Inclusion 2**

*Position on landscape:* Summits of plateaus at higher elevations  
*Slope features:* Length—short; shape—convex  
*Contrasting features:* Cemented pan at a depth of 20 to 40 inches  
*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, antelope bitterbrush

**Inclusion 3**

*Position on landscape:* Scattered small areas of rimrock on summits of plateaus  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Mopana Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—rooting depth, large stones  
*Shallow excavations:* Severe—cemented pan  
*Local roads and streets:* Severe—cemented pan, shrink-swell, low strength  
*Roadfill:* Poor—cemented pan, shrink-swell, low strength  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Hottle Variant Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—fair; domestic grasses and legumes (irrigated)—fair; wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good;

wetland plants—poor; shallow water areas—very poor

*Range seeding:* Good

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action

*Roadfill:* Fair—thin layer

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping

### **Interpretive Groups**

*Capability classification:* Mopana soil—VIIs, nonirrigated; Holtle Variant soil—IIIe, irrigated, and VIc, nonirrigated

*Range site:* Mopana soil—026X028N; Holtle Variant—026X038N

## **5050—Nire-Epvip-Hiridge association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,400 to 8,600 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 75 days

### **Composition**

*Major components:*

- Nire stony fine sandy loam, 30 to 50 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal, mixed)—40 percent
- Epvip gravelly sandy loam, 15 to 50 percent slopes (Aridic Argixerolls, loamy-skeletal, mixed, frigid, shallow)—35 percent
- Hiridge gravelly sandy loam, 8 to 30 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—6 percent
- Inclusion 2: Typic Cryoboralfs, stony loamy fine sand, 8 to 30 percent slopes (Typic Cryoboralfs, clayey-skeletal, mixed)—2 percent
- Inclusion 3: Typic Cryorthents, stony loamy fine sand, 8 to 30 percent slopes (Typic Cryorthents)—2 percent

### **Characteristics of the Nire Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock and eolian volcanic ash

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush,

antelope bitterbrush, western needlegrass, basin wildrye

*Percent of surface covered by rock fragments:* 3 percent stones

### **Typical Profile**

0 to 15 inches—stony fine sandy loam; 10 to 30 percent cobbles and stones, 10 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

15 to 39 inches—very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam; 25 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2

39 to 60 inches—cobbley clay; 15 to 30 percent cobbles and stones, 10 to 30 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 14 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Epvip Soil**

*Position on landscape:* South-, east-, and west-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesite and related rocks

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Mountain big sagebrush, antelope bitterbrush, basin wildrye, western needlegrass

### Typical Profile

0 to 8 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

8 to 19 inches—very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

19 to 30 inches—weathered bedrock

30 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 12 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Hiridge Soil

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum

### Typical Profile

0 to 4 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very

friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Crests of mountains

*Slope features:* Length—short; shape—convex

*Contrasting features:* No thick dark surface layer, bedrock at a depth of 20 to 30 inches

*Distinctive present vegetation:* Curlleaf mountainmahogany

#### Inclusion 3

*Position on landscape:* Back slopes of mountains

*Slope features:* Length—short; shape—concave

*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity

*Distinctive present vegetation:* Quaking aspen

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Nire Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good  
*Range seeding:* Fair—large stones  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Sand:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, large stones

**Ratings of the Epvip Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Nire soil—VII<sub>s</sub>, nonirrigated; Epvip soil—VII<sub>e</sub>, nonirrigated; Hiridge soil—VII<sub>e</sub>, nonirrigated  
*Range site:* Nire soil—026X005N; Epvip soil—026X005N; Hiridge soil—026X028N

**5051—Nire stony fine sandy loam, 4 to 15 percent slopes****Map Unit Setting**

*Position on landscape:* Plateaus  
*Elevation:* 7,500 to 9,000 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 75 days

**Composition***Major components:*

- Nire stony fine sandy loam, 4 to 15 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal, mixed)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Nire very stony sandy loam, 15 to 30 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal, mixed)—6 percent
- Inclusion 2: Cryopsamments loamy sand, 8 to 15 percent slopes (Cryopsamments, ashy)—3 percent
- Inclusion 3: Rock outcrop—1 percent

**Characteristics of the Nire Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum and colluvium; source—volcanic rock and eolian volcanic ash

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Mountain big sagebrush, antelope bitterbrush, western needlegrass, basin wildrye

*Percent of surface covered by rock fragments:* 15 percent pebbles, 1 percent cobbles, 2 percent stones

**Typical Profile**

0 to 15 inches—stony fine sandy loam; 10 to 30 percent cobbles and stones, 10 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

15 to 39 inches—very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam; 25 to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2

39 to 60 inches—cobble clay; 15 to 30 percent cobbles and stones, 10 to 30 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 10 inches  
*Water-supplying capacity:* About 14 inches  
*Runoff:* Medium  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Back slopes and shoulder slopes of plateaus adjacent to rock outcrop  
*Contrasting features:* Slopes of more than 15 percent

#### **Inclusion 2**

*Position on landscape:* Pockets on back slopes and shoulder slopes of plateaus  
*Slope features:* Length—short; shape—concave  
*Contrasting features:* No layer of clay accumulation, fewer stones on the surface

#### **Inclusion 3**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Nire Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good  
*Range seeding:* Fair—large stones  
*Shallow excavations:* Moderate—too clayey, large stones, slope  
*Local roads and streets:* Moderate—slope, frost action, large stones  
*Roadfill:* Fair—large stones, thin layer  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, large stones

### **Interpretive Groups**

*Capability classification:* VIs, nonirrigated  
*Range site:* 026X005N

## **5052—Nire-Hiridge association**

### **Map Unit Setting**

*Position on landscape:* Plateaus  
*Elevation:* 7,600 to 8,400 feet  
*Average annual precipitation:* About 14 inches  
*Average annual air temperature:* About 44 degrees F  
*Frost-free season:* About 75 days

### **Composition**

#### *Major components:*

- Nire very stony sandy loam, 15 to 50 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal, mixed)—70 percent
- Hiridge stony sandy loam, 4 to 15 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Typic Haploxerolls, extremely stony sandy loam, 30 to 50 percent slopes (Typic Haploxerolls, loamy-skeletal, mixed, frigid)—5 percent
- Inclusion 2: Rock outcrop—5 percent
- Inclusion 3: Typic Cryoborolls, very stony sandy loam, 4 to 15 percent slopes (Typic Cryoborolls, loamy-skeletal, mixed)—3 percent
- Inclusion 4: Typic Cryoborolls, sandy loam, 2 to 8 percent slopes (Typic Cryoborolls, coarse-loamy, mixed)—2 percent

### **Characteristics of the Nire Soil**

*Position on landscape:* Shoulder slopes and back slopes of plateaus, predominantly below rimrock  
*Parent material:* Kind—residuum and colluvium; source—volcanic rock and eolian volcanic ash  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Mountain big sagebrush, antelope bitterbrush, western needlegrass, basin wildrye  
*Percent of surface covered by rock fragments:* 5 percent stones

### **Typical Profile**

0 to 15 inches—very stony sandy loam; 15 to 40 percent cobbles and stones, 20 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2  
 15 to 39 inches—very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam; 25

to 50 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2

39 to 60 inches—cobbly clay; 15 to 30 percent cobbles and stones, 10 to 30 percent pebbles (by weight); subangular blocky structure; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, CH; estimated AASHTO classification—A-7

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 10 inches

*Water-supplying capacity:* About 14 inches

*Runoff:* Medium

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* High

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

#### **Characteristics of the Hiridge Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum and colluvium; source—altered andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum

*Percent of surface covered by rock fragments:* 3 percent stones

#### **Typical Profile**

0 to 4 inches—stony sandy loam; 5 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2);

nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* South-facing back slopes of plateaus

*Slope features:* Length—long; shape—concave

*Contrasting features:* Warmer average soil temperature, lower water-supplying capacity

##### **Inclusion 2**

*Position on landscape:* Scattered areas of rimrock throughout the map unit

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

##### **Inclusion 3**

*Position on landscape:* Shoulder slopes of plateaus adjacent to rock outcrop

*Slope features:* Length—short; shape—convex

*Contrasting features:* No layer of clay accumulation, bedrock at a depth of 20 to 40 inches

*Distinctive present vegetation:* Mountain big sagebrush, needlegrass, basin wildrye

##### **Inclusion 4**

*Position on landscape:* Small intraplateau basins

*Contrasting features:* Bedrock at a depth of more than 60 inches, less than 35 percent rock fragments

throughout the profile, no layer of clay accumulation

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Nire Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—large stones

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—depth to bedrock, slope, frost action

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Nire soil—VII<sub>s</sub>, nonirrigated; Hiridge soil—VII<sub>s</sub>, nonirrigated

*Range site:* Nire soil—026X005N; Hiridge soil—026X028N

### **5080—Epvip-Hiridge-Katyblay association**

#### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,600 to 8,600 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 75 days

#### **Composition**

*Major components:*

- Epvip gravelly sandy loam, 15 to 50 percent slopes (Aridic Argixerolls, loamy-skeletal, mixed, frigid, shallow)—45 percent
  - Hiridge gravelly sandy loam, 8 to 30 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—25 percent
  - Katyblay fine sandy loam, 30 to 50 percent slopes (Andeptic Cryoboralfs, loamy-skeletal, mixed)—20 percent
- Contrasting inclusions:*
- Inclusion 1: Nire stony fine sandy loam, 15 to 50 percent slopes (Argic Pachic Cryoborolls, loamy-skeletal, mixed)—4 percent

- Inclusion 2: Rock outcrop—3 percent
- Inclusion 3: Cumulic Cryoborolls, stony loam, 2 to 15 percent slopes (Cumulic Cryoborolls)—2 percent
- Inclusion 4: Cryaquents, fine sandy loam, 0 to 4 percent slopes (Cryaquents)—1 percent

#### **Characteristics of the Epvip Soil**

*Position on landscape:* South-, east-, and west-facing back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock with additions of eolian volcanic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Mountain big sagebrush, antelope bitterbrush, basin wildrye, western needlegrass

*Percent of surface covered by rock fragments:* 15 percent pebbles, 3 percent cobbles

#### **Typical Profile**

0 to 8 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

8 to 19 inches—very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam; 0 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

19 to 30 inches—weathered bedrock

30 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 12 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Hiridge Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum

### **Typical Profile**

0 to 4 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.17; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Katyblay Soil**

*Position on landscape:* North-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesitic rock with a mantle of eolian volcanic ash

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, western needlegrass, snowberry, basin wildrye

### **Typical Profile**

0 to 16 inches—fine sandy loam; 0 to 15 percent pebbles (by weight); subangular blocky structure; soft, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-5

16 to 33 inches—gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

33 to 60 inches—very gravelly sandy clay loam, very gravelly loam; 0 to 10 percent cobbles and stones, 45 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, GM-GC, SC, GC; estimated AASHTO classification—A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 16 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—moderate

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing back slopes of mountains

*Slope features:* Length—short; shape—concave

*Contrasting features:* Thicker dark surface layer

*Distinctive present vegetation:* Mountain big sagebrush, antelope bitterbrush, western needlegrass

#### **Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

### **Inclusion 3**

*Position on landscape:* Stream terraces

*Contrasting features:* No layer of clay accumulation, thicker dark surface layer, occasionally flooded

### **Inclusion 4**

*Position on landscape:* Intramontane basins

*Contrasting features:* No horizon of clay accumulation, bedrock at a depth of more than 60 inches, water table at a depth of 18 to 30 inches

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Epvip Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Katyblay Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—erodes easily

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Slight

### **Interpretive Groups**

*Capability classification:* Epvip soil—VIIe, nonirrigated; Hiridge soil—VIIe, nonirrigated; Katyblay soil—VIIe, nonirrigated

*Range site:* Epvip soil—026X005N; Hiridge soil—026X028N; Katyblay soil—026X038N

## **5100—Oricto-Gynelle-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,100 to 5,200 feet

*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 145 days

### **Composition**

*Major components:*

- Oricto very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—50 percent

- Gynelle very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—30 percent

- Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—10 percent

*Contrasting inclusions:*

- Inclusion 1: Terlco very gravelly sandy loam, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—5 percent

- Inclusion 2: Oricto very gravelly sandy loam, 8 to 30 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Oricto Soil**

*Position on landscape:* Higher summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Cooper wolfberry

### **Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2

8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Medium

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

#### **Characteristics of the Gynelle Soil**

*Position on landscape:* Remnants of inset fan summits

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Bailey greasewood, shadscale, Cooper wolfberry, Indian ricegrass

#### **Typical Profile**

0 to 3 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1

3 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent

cobbles and stones, 40 to 65 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* Rare

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 4 inches

*Runoff:* Slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Rubber rabbitbrush, burrobrush, littleleaf horsebrush, Bailey greasewood

#### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Summits of fan piedmont remnants at higher elevations  
*Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Spiny menodora, galleta

#### **Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants  
*Contrasting features:* Slopes of more than 8 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Oricto Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

#### **Ratings of the Gynelle Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, large stones

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Severe—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Oricto soil—VII<sub>s</sub>, nonirrigated; Gynelle soil—VII<sub>s</sub>, nonirrigated; Izo soil—VII<sub>w</sub>, nonirrigated  
*Range site:* Oricto soil—029X032N; Gynelle soil—027X043N; Izo soil—029X041N

## **5101—Oricto-Izo association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,100 to 5,200 feet  
*Average annual precipitation:* About 5 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 145 days

### **Composition**

#### *Major components:*

- Oricto very gravelly sandy loam, 4 to 30 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—75 percent
  - Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Terlco very gravelly sandy loam, 2 to 15 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—6 percent
  - Inclusion 2: Typic Torriorthents, very gravelly sandy loam, 15 to 50 percent slopes (Typic Torriorthents)—4 percent

### **Characteristics of the Oricto Soil**

*Position on landscape:* Higher summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry

**Typical Profile**

- 0 to 3 inches—very gravelly fine sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1
- 14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Rapid  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

**Characteristics of the Izo Soil**

- Position on landscape:* Channels  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Rubber rabbitbrush, burrobrush, littleleaf horsebrush, Indian ricegrass

**Typical Profile**

- 0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1
- 8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

- Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Flooding:* Frequency—occasional; duration—very brief; months—December to August  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—severe; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Higher summits of fan piedmont remnants

- Contrasting features:* Higher water-supplying capacity  
*Distinctive present vegetation:* Spiny menodora, galleta

**Inclusion 2**

- Position on landscape:* Side slopes of fan piedmont remnants

- Slope features:* Length—very short; shape—slightly concave

*Contrasting features:* No layer of clay accumulation, slopes of more than 15 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Oricto Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Fair—large stones, slope

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Oricto soil—VIIIs, nonirrigated; Izo soil—VIIw, nonirrigated

*Range site:* Oricto soil—029X032N; Izo soil—029X041N

## **5103—Oricto, dry-Sundown-Oricto association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 4,100 to 5,200 feet

*Average annual precipitation:* About 4 inches

*Average annual air temperature:* About 54 degrees F

*Frost-free season:* About 145 days

### **Composition**

*Major components:*

- Oricto loamy sand, dry, 8 to 30 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—50 percent
- Sundown loamy sand, 2 to 8 percent slopes (Typic Torripsamments, mixed, mesic)—25 percent
- Oricto gravelly sandy loam, 2 to 8 percent slopes

(Typic Haplargids, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Isolde fine sand, 4 to 15 percent slopes (Typic Torripsamments, mixed, mesic)—4 percent
- Inclusion 2: Izo very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Rock outcrop—2 percent
- Inclusion 4: Dune land—1 percent

### **Characteristics of the Dry Oricto Soil**

*Position on landscape:* Higher side slopes of fan piedmont remnants with thin sand sheets

*Parent material:* Mixed alluvium

*Slope features:* Length—very short; shape—slightly convex

*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, fourwing saltbush

### **Typical Profile**

- 0 to 3 inches—loamy sand; 0 to 5 percent cobbles and stones, 10 to 15 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.2); nonsaline (2 to 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1
- 14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 15 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified

classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2  
*Hazard of erosion:* By water—moderate; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### Characteristics of the Sundown Soil

*Position on landscape:* Sand sheets over inset fans or remnants of inset fans  
*Parent material:* Kind—alluvium and eolian material; source—various kinds of rock  
*Slope features:* Length—short; shape—slightly concave  
*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, Russian-thistle, fourwing saltbush

### Typical Profile

0 to 3 inches—loamy sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1  
 3 to 60 inches—loamy fine sand; 0 to 5 percent cobbles and stones, 0 to 15 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 9.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Rapid  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Very slow  
*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.20; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—slight; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Characteristics of the Oricto Soil

*Position on landscape:* Higher summits of fan piedmont remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Shadscale, Cooper wolfberry

### Typical Profile

0 to 3 inches—gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-2, A-4  
 3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1  
 14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Semistabilized sand dunes  
*Contrasting features:* Dominantly fine sand throughout the profile, more erosive  
*Distinctive present vegetation:* Hairy horsebrush, Indian ricegrass

#### **Inclusion 2**

*Position on landscape:* Channels  
*Contrasting features:* No layer of clay accumulation, more than 35 percent rock fragments throughout the profile, occasionally flooded  
*Distinctive present vegetation:* Burrobrush, rabbitbrush

#### **Inclusion 3**

*Position on landscape:* Scattered small peaks on side slopes of fan piedmont remnants  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### **Inclusion 4**

*Position on landscape:* Unstabilized shifting sand dunes  
*Contrasting features:* Highly erosive unstabilized sand dunes  
*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Dry Oricto Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too sandy, excess salt  
*Shallow excavations:* Severe—cutbanks cave, slope  
*Local roads and streets:* Severe—large stones, slope  
*Roadfill:* Fair—large stones, slope  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

#### **Ratings of the Sundown Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—poor; shallow water areas—very poor  
*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Slight  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Moderate—seepage

#### **Ratings of the Oricto Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

### **Interpretive Groups**

*Capability classification:* Dry Oricto soil—VIIe, nonirrigated; Sundown soil—IVs, irrigated, and VIIs, nonirrigated; Oricto soil—VIIc, nonirrigated  
*Range site:* Dry Oricto soil—027X060N; Sundown soil—027X060N; Oricto soil—029X032N

## **5105—Oricto-Luning association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 4,100 to 5,000 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 145 days

### **Composition**

*Major components:*

- Oricto gravelly loamy sand, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—60 percent
- Luning gravelly loamy sand, gravelly substratum, 0 to 4 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Eastgate gravelly loamy sand, 0 to 4 percent slopes (Typic Camborthids, sandy, mixed, mesic)—6 percent
- Inclusion 2: Luning gravelly loamy fine sand, gravelly substratum, 4 to 30 percent slopes (Typic Torriorthents, sandy, mixed, mesic)—5 percent
- Inclusion 3: Oricto loamy sand, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Izo very gravelly loamy sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—1 percent

**Characteristics of the Oricto Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry

**Typical Profile**

- 0 to 3 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1
- 14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly

alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—slight; by wind—moderate

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

**Characteristics of the Luning Soil**

*Position on landscape:* Inset fan remnants with sand sheets

*Parent material:* Mixed alluvium with a cap of sandy eolian material

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Indian ricegrass, Cooper wolfberry, Bailey greasewood, fourwing saltbush

**Typical Profile**

- 0 to 6 inches—gravelly loamy sand; 0 to 10 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1
- 6 to 35 inches—loamy fine sand, fine sand; 0 to 25 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2
- 35 to 60 inches—stratified very gravelly sand to gravelly loamy fine sand; 0 to 10 percent cobbles and stones, 55 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GP, SP; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 5 inches  
*Runoff:* Very slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—moderate  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Remnants of inset fans with sand sheets

*Contrasting features:* Less than 35 percent rock fragments between depths of 0 and 30 inches, sandy loam layer at a depth of less than 20 inches

#### Inclusion 2

*Position on landscape:* North- and west-facing side slopes of fan piedmont remnants with sand sheets  
*Contrasting features:* Slopes of more than 4 percent, no layer of clay accumulation

#### Inclusion 3

*Position on landscape:* Remnants of fan piedmonts with sand sheets

*Contrasting features:* Sandy surface

#### Inclusion 4

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Oricto Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, too sandy, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

#### Ratings of the Luning Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor; wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—too arid, droughty, too sandy  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding  
*Roadfill:* Good  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, piping

### Interpretive Groups

*Capability classification:* Oricto soil—VII, nonirrigated; Luning soil—IVs, irrigated, and VIIs, nonirrigated  
*Range site:* Oricto soil—029X032N; Luning soil—027X060N

## 5106—Oricto-Barnmot-Gynelle association

### Map Unit Setting

*Position on landscape:* Fan piedmonts over hills  
*Elevation:* 4,400 to 5,000 feet  
*Average annual precipitation:* About 4 inches  
*Average annual air temperature:* About 54 degrees F  
*Frost-free season:* About 145 days

### Composition

#### Major components:

- Oricto very gravelly sandy loam, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—45 percent
  - Barnmot gravelly clay loam, 8 to 30 percent slopes (Typic Torriorthents, fine, montmorillonitic [calcareous], mesic)—25 percent
  - Gynelle very gravelly loamy sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent
- Contrasting inclusions:*
- Inclusion 1: Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—8 percent
  - Inclusion 2: Blacktop very gravelly sandy loam, 15 to 30 percent slopes (Lithic Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—5 percent
  - Inclusion 3: Badland—2 percent

### Characteristics of the Oricto Soil

*Position on landscape:* Shoulder slopes and summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry

### Typical Profile

- 0 to 3 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2
- 3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 30 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly saline (4 to 8 mmhos/cm); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 15 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1
- 14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 0 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### Characteristics of the Barnmot Soil

*Position on landscape:* Back slopes of fan piedmont remnants over exhumed back slopes of hills

*Parent material:* Kind—residuum and colluvium; source—semiconsolidated lake sediments

*Slope features:* Length—very short; shape—convex to concave

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### Typical Profile

- 0 to 2 inches—gravelly clay loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SC; estimated AASHTO classification—A-6
- 2 to 60 inches—clay, clay loam; 0 to 10 percent pebbles (by weight); massive; hard, friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—CH, MH; estimated AASHTO classification—A-7

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Very slow  
*Available water capacity:* About 8 inches  
*Water-supplying capacity:* About 3 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* High  
*Corrosivity:* Steel—high; concrete—high  
*Potential for frost action:* Low

### Characteristics of the Gynelle Soil

*Position on landscape:* Inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry, Indian ricegrass

**Typical Profile**

- 0 to 2 inches—very gravelly loamy sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, SP-SM, GM, GP-GM; estimated AASHTO classification—A-1
- 2 to 60 inches—stratified very gravelly sandy loam to extremely cobbly coarse sand; 15 to 40 percent cobbles and stones, 40 to 60 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.5); slightly saline (4 to 8 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1

**Soil and Water Features**

- Depth to hardpan:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Slow  
*Hydrologic group:* A  
*Erosion factors (surface layer):* K value—.02; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

**Contrasting Inclusions****Inclusion 1**

- Position on landscape:* Channels  
*Contrasting features:* No layer of clay accumulation, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, burrobrush

**Inclusion 2**

- Position on landscape:* Hills  
*Contrasting features:* Bedrock within a depth of 20 inches

**Inclusion 3**

- Position on landscape:* Scattered areas of exposed sedimentary rock on back slopes of fan piedmont remnants  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Ratings of the Oricto Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—large stones  
*Roadfill:* Fair—large stones  
*Sand:* Probable source  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

**Ratings of the Barnmot Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, small stones, excess salt  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—low strength, slope, shrink-swell  
*Roadfill:* Poor—low strength, shrink-swell  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—hard to pack

**Ratings of the Gynelle Soil for Various Uses**

- Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—too arid, droughty, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, large stones  
*Roadfill:* Fair—large stones  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage, large stones

**Interpretive Groups**

- Capability classification:* Oricto soil—VIIs, nonirrigated; Barnmot soil—VIIe, nonirrigated; Gynelle soil—VIIs, nonirrigated  
*Range site:* Oricto soil—029X032N; Barnmot soil—027X027N; Gynelle soil—029X043N

**5107—Oricto-Terlco-Roic association****Map Unit Setting**

- Position on landscape:* Fan piedmonts  
*Elevation:* 5,200 to 5,800 feet  
*Average annual precipitation:* About 5 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 135 days

### **Composition**

#### *Major components:*

- Oricto very cobbly fine sandy loam, 2 to 8 percent slopes (Typic Haplargids, sandy-skeletal, mixed, mesic)—40 percent
- Terlco very gravelly fine sandy loam, 2 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—30 percent
- Roic very gravelly fine sandy loam, dry, 8 to 15 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—15 percent

#### *Contrasting inclusions:*

- Inclusion 1: Badland—6 percent
- Inclusion 2: Wardenot very gravelly fine sandy loam, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Izo very gravelly sand, 2 to 8 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

### **Characteristics of the Oricto Soil**

*Position on landscape:* Lower summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Cooper wolfberry

#### **Typical Profile**

- 0 to 3 inches—very cobbly fine sandy loam; 25 to 40 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.5); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2
- 3 to 8 inches—very gravelly loam, very gravelly sandy clay loam; 5 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.2); slightly sodic to moderately sodic (SAR 13 to 46); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 8 to 14 inches—extremely cobbly sandy loam, very gravelly coarse sandy loam; 10 to 45 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; very strongly alkaline (pH 9.6); moderately saline to strongly saline (more than 8 mmhos/cm);

slightly sodic to strongly sodic (SAR 13 to 70); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

- 14 to 60 inches—stratified extremely gravelly coarse sand to very gravelly loamy sand; 15 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); massive; soft, very friable; very strongly alkaline (pH 9.2); moderately saline to strongly saline (more than 8 mmhos/cm); slightly sodic to strongly sodic (SAR 13 to 60); estimated Unified classification—GP, GM, GP-GM, SP-SM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 3 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

### **Characteristics of the Terlco Soil**

*Position on landscape:* Upper summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Spiny menodora, shadscale, bud sagebrush, galleta

#### **Typical Profile**

- 0 to 2 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1
- 2 to 11 inches—gravelly clay loam, gravelly loam, gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); prismatic structure parting to subangular blocky; slightly hard, very friable; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); slightly sodic (SAR 13 to 30); estimated Unified

classification—CL, GC, SC; estimated AASHTO classification—A-6, A-7

11 to 18 inches—very gravelly sandy loam; 0 to 30 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; slightly hard, very friable; moderately alkaline (pH 8.4); nonsaline to slightly saline (2 to 8 mmhos/cm); nonsodic (SAR less than 13); estimated Unified classification—GM; estimated AASHTO classification—A-1

18 to 60 inches—very gravelly loamy sand, very gravelly sand, very cobbly loamy sand; 0 to 40 percent cobbles and stones, 50 to 65 percent pebbles (by weight); single grained; loose; strongly alkaline (pH 8.8); nonsaline to slightly saline (2 to 8 mmhos/cm); estimated Unified classification—SP-SM, SM, GP-GM, GM; estimated AASHTO classification—A-1

#### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—moderate

*Potential for frost action:* Low

#### **Characteristics of the Roic Soil**

*Position on landscape:* Side slopes of hills

*Parent material:* Kind—residuum; source—Tertiary lacustrine materials

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, King desertgrass

#### **Typical Profile**

0 to 2 inches—gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM, SM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—fine sandy loam, very fine sandy loam, loam; 0 to 20 percent pebbles (by weight); massive;

soft, very friable; moderately alkaline (pH 8.5); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—CL-ML, SM-SC, ML, SM; estimated AASHTO classification—A-4

5 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—high

*Potential for frost action:* Low

#### **Contrasting Inclusions**

##### **Inclusion 1**

*Position on landscape:* Scattered areas of exposed sedimentary rock on side slopes of hills

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

##### **Inclusion 2**

*Position on landscape:* Inset fans

*Contrasting features:* No layer of clay accumulation, bedrock at a depth of more than 60 inches

##### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* No layer of clay accumulation, occasionally flooded, bedrock at a depth of more than 60 inches

*Distinctive present vegetation:* Rabbitbrush, burrobrush

#### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Oricto Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage, excess sodium, excess salt

#### **Ratings of the Terlco Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—very poor; shrubs (nonirrigated)—very poor

*Range seeding:* Poor—too arid, small stones, excess salt

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—large stones

*Roadfill:* Fair—large stones

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—excess sodium, seepage

#### **Ratings of the Roic Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—depth to bedrock

*Local roads and streets:* Moderate—slope, depth to bedrock

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Interpretive Groups**

*Capability classification:* Oricto soil—VIIs, nonirrigated; Terlco soil—VIIs, nonirrigated; Roic soil—VIIs, nonirrigated

*Range site:* Oricto soil—029X032N; Terlco soil—029X036N; Roic soil—029X033N

### **5110—Cucamungo Variant gravelly sandy loam, 4 to 15 percent slopes**

#### **Map Unit Setting**

*Position on landscape:* Intermontane rock pediments

*Elevation:* 7,000 to 7,400 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 100 days

#### **Composition**

*Major components:*

• Cucamungo Variant gravelly sandy loam, 4 to 15 percent slopes (Typic Argixerolls, fine-loamy, mixed, frigid)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Nupart very gravelly coarse sandy loam, 15 to 30 percent slopes (Entic Haploxerolls, sandy-skeletal, mixed, frigid, shallow)—5 percent
- Inclusion 2: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Lazan very gravelly coarse sand, 15 to 50 percent slopes (Typic Xerorthents, sandy-skeletal, mixed, mesic, shallow)—3 percent
- Inclusion 4: Rock outcrop—2 percent

#### **Characteristics of the Cucamungo Variant**

*Position on landscape:* Intermontane rock pediments

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, needlegrasses, antelope bitterbrush

#### **Typical Profile**

0 to 7 inches—gravelly sandy loam; 25 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

7 to 11 inches—gravelly sandy loam, gravelly coarse sandy loam; 25 to 40 percent pebbles (by weight); subangular blocky structure; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC; estimated AASHTO classification—A-2

11 to 21 inches—gravelly sandy clay loam; 30 to 45 percent pebbles (by weight); massive; hard, friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

21 inches—weathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 13 inches

*Runoff:* Slow

*Hydrologic group:* B

*Hazard of erosion:* By water—slight; by wind—slight  
*Erosion factors (surface layer):* K value—17; T value—2;  
 wind erodibility group—4  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* North-facing side slopes of mountains

*Contrasting features:* Weathered bedrock at a depth of less than 10 inches

#### **Inclusion 2**

*Position on landscape:* Inset fans and remnants of inset fans

*Contrasting features:* More than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta

#### **Inclusion 3**

*Position on landscape:* South-facing side slopes of mountains

*Contrasting features:* Weathered bedrock at a depth of less than 10 inches

*Distinctive present vegetation:* Singleleaf pinyon, Wyoming big sagebrush, desert needlegrass

#### **Inclusion 4**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Cucamongo Variant for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Fair—droughty, small stones

*Shallow excavations:* Moderate—depth to bedrock, slope

*Local roads and streets:* Moderate—slope, frost action, shrink-swell

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Range site:* 026X006N

## **6000—Hiridge-Katyblay-Granmount association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 8,000 to 9,400 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 44 degrees F

*Frost-free season:* About 80 days

### **Composition**

*Major components:*

- Hiridge very gravelly sandy loam, 8 to 30 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—40 percent
- Katyblay gravelly fine sandy loam, 30 to 50 percent slopes (Andeptic Cryoboralfs, loamy-skeletal, mixed)—30 percent
- Granmount very gravelly fine sandy loam, 15 to 50 percent slopes (Argic Cryoborolls, clayey-skeletal, mixed)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Typic Cryoboralfs, stony loamy fine sand, 8 to 30 percent slopes (Typic Cryoboralfs, clayey-skeletal, mixed)—7 percent
- Inclusion 2: Typic Cryorthents, stony loamy fine sand, 5 to 50 percent slopes (Typic Cryorthents, ashy)—5 percent
- Inclusion 3: Rock outcrop—2 percent
- Inclusion 4: Typic Cryoboralfs, very stony loamy fine sand, 30 to 50 percent slopes (Typic Cryoboralfs, loamy-skeletal, mixed)—1 percent

### **Characteristics of the Hiridge Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesite

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum

### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70

percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Katyblay Soil

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesitic rock with a mantle of eolian volcanic ash

*Slope features:* Length—long; shape—concave

*Dominant present vegetation:* Mountain big sagebrush, western needlegrass, snowberry, basin wildrye

### Typical Profile

0 to 16 inches—gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

16 to 33 inches—gravelly fine sandy loam; 30 to 45 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

33 to 60 inches—very gravelly sandy clay loam, very gravelly loam; 0 to 10 percent cobbles and stones, 45 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified

classification—SM-SC, GM-GC, GC, SC; estimated AASHTO classification—A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 7 inches

*Water-supplying capacity:* About 16 inches

*Runoff:* Rapid

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—moderate

*Potential for frost action:* Moderate

### Characteristics of the Granmount Soil

*Position on landscape:* Back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—andesite and related rocks

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum, needlegrass

### Typical Profile

0 to 10 inches—very gravelly fine sandy loam; 5 to 25 percent cobbles and stones, 45 to 65 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2

10 to 33 inches—extremely gravelly clay, very gravelly clay; 10 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

33 to 60 inches—very cobbly clay loam; 40 to 50 percent cobbles and stones, 40 to 50 percent pebbles (by weight); angular blocky structure; hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-6, A-7

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Slow  
*Available water capacity:* About 5 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* C  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Crests and shoulder slopes of mountains at higher elevations  
*Contrasting features:* Bedrock at a depth of 10 to 20 inches, average of more than 35 percent clay throughout the profile  
*Distinctive present vegetation:* Curlleaf mountainmahogany

#### **Inclusion 2**

*Position on landscape:* North-facing back slopes of mountains  
*Slope features:* Length—short; shape—concave  
*Contrasting features:* No layer of clay accumulation, higher water-supplying capacity  
*Distinctive present vegetation:* Quaking aspen, mountain big sagebrush

#### **Inclusion 3**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### **Inclusion 4**

*Position on landscape:* North-facing back slopes and shoulder slopes of mountains  
*Slope features:* Shape—slightly concave  
*Contrasting features:* Higher water-supplying capacity, colder average soil temperature  
*Distinctive present vegetation:* Limber pine

**Other inclusions (in only a few areas):** Pachic Cryoborolls, stony fine sandy loam, 4 to 30 percent slopes (Pachic Cryoborolls, loamy-skeletal, mixed)

*Position on landscape:* Seep areas on back slopes of mountains  
*Slope features:* Length—short; shape—concave  
*Contrasting features:* Thicker dark surface layer, no layer of clay accumulation

*Distinctive present vegetation:* Mountain big sagebrush, antelope bitterbrush, basin wildrye

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, small stones  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Katyblay Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good  
*Range seeding:* Fair—erodes easily  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Slight

#### **Ratings of the Granmount Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; shrubs (nonirrigated)—good  
*Range seeding:* Poor—small stones  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Moderate—large stones

### **Interpretive Groups**

*Capability classification:* Hiridge soil—VIIs, nonirrigated; Katyblay soil—VIIe, nonirrigated; Granmount soil—VIIs, nonirrigated  
*Range site:* Hiridge soil—026X028N; Katyblay soil—026X038N; Granmount soil—026X028N

## **6001—Hiridge very gravelly sandy loam, 8 to 30 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 8,400 to 9,200 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 45 degrees F

*Frost-free season:* About 75 days

### **Composition**

*Major components:*

- Hiridge very gravelly sandy loam, 8 to 30 percent slopes (Argic Cryoborolls, loamy-skeletal, mixed, shallow)—90 percent

*Contrasting inclusions:*

- Inclusion 1: Wassit stony fine sandy loam, 30 to 50 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—5 percent
- Inclusion 2: Stewval very gravelly sandy loam, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

### **Characteristics of the Hiridge Soil**

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—altered andesite

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Low sagebrush, pine bluegrass, eriogonum

### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 18 inches—very gravelly clay loam, very gravelly loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; hard, firm; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2

18 to 23 inches—weathered bedrock

23 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Back slopes of mountains

*Slope features:* Length—short; shape—concave

*Contrasting features:* Higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper

#### **Inclusion 2**

*Position on landscape:* Back slopes of mountains at lower elevations

*Contrasting features:* Warmer average soil temperature, thinner dark surface layer

*Distinctive present vegetation:* Black sagebrush, Sandberg bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Hiridge Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated

*Range site:* 026X028N

## **6010—Typic Cryorthents, 15 to 50 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Side slopes of mountains

*Elevation:* 7,800 to 9,000 feet

*Average annual precipitation:* About 14 inches

*Average annual air temperature:* About 42 degrees F

*Frost-free season:* About 75 days

### Composition

#### Major components:

- Typic Cryorthents, loamy fine sand, 15 to 50 percent slopes (Typic Cryorthents)—85 percent

#### Contrasting inclusions:

- Inclusion 1: Katyblay gravelly fine sandy loam, 30 to 50 percent slopes (Andeptic Cryoboralfs, loamy-skeletal, mixed)—8 percent
- Inclusion 2: Typic Cryorthents, very stony loamy fine sand, 15 to 50 percent slopes (Typic Cryorthents)—5 percent
- Inclusion 3: Typic Cryoboralfs, stony fine sandy loam, 4 to 15 percent slopes (Typic Cryoboralfs, loamy-skeletal, mixed)—2 percent

### Characteristics of the Typic Cryorthents

*Position on landscape:* North-facing side slopes of mountains

*Parent material:* Kind—residuum and eolian material; source—volcanic rock with a mantle of volcanic ash

*Slope features:* Length—short; shape—concave

*Dominant present vegetation:* Quaking aspen, mountain big sagebrush, snowberry

### Reference Profile

0 to 22 inches—loamy fine sand; 0 to 10 percent cobbles and stones, 0 to 25 percent pebbles (by weight); massive; soft, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2, A-5

22 to 60 inches—gravelly fine sandy loam, very gravelly fine sandy loam, gravelly loam; 0 to 10 percent cobbles and stones, 30 to 65 percent pebbles (by weight); massive; soft, very friable; slightly acid (pH 6.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1, A-2, A-4

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 12 inches

*Water-supplying capacity:* About 25 inches

*Runoff:* Medium

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.37; T value—5; wind erodibility group—2

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* High

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Back slopes of mountains

*Contrasting features:* Layer of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Mountain big sagebrush, needlegrass

#### Inclusion 2

*Position on landscape:* Side slopes of mountains

*Contrasting features:* 3 to 15 percent stones on the surface

#### Inclusion 3

*Position on landscape:* Shoulder slopes of mountains adjacent to wet areas on altered volcanic rock

*Contrasting features:* Slopes of less than 15 percent, layer of clay accumulation

*Distinctive present vegetation:* Lodgepole pine

### Major Uses

**Current uses:** Rangeland, wildlife habitat, woodland

### Woodland

*Site index for common trees:* Quaking aspen—40

*Most important native understory plants:* Mountain brome, wheatgrass, Nevada bluegrass, basin wildrye, snowberry, mountain big sagebrush

### Ratings of the Typic Cryorthents for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; coniferous plants (nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—erodes easily

*Shallow excavations:* Severe—cutbanks cave, slope

*Local roads and streets:* Severe—frost action, slope

*Roadfill:* Poor—slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Moderate—seepage, piping

### Interpretive Groups

*Capability classification:* VIIe, nonirrigated

*Woodland suitability group:* 4R

### 6020—Celeton-Dumps-Izo association

#### Map Unit Setting

*Position on landscape:* Fan piedmonts

*Elevation:* 5,900 to 6,100 feet

*Average annual precipitation:* About 6 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Celeton very gravelly loam, 4 to 30 percent slopes (Typic Torriorthents, loamy, mixed [calcareous], mesic, shallow)—40 percent
- Dumps—30 percent
- Izo very gravelly sand, 2 to 4 percent slopes (Typic Torriorthents, sandy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Truhoy very gravelly fine sandy loam, 2 to 4 percent slopes (Entic Durorthids, loamy, mixed, mesic, shallow)—9 percent
- Inclusion 2: Durorthidic Torriorthents, very gravelly sandy loam, 2 to 4 percent slopes (Durorthidic Torriorthents, sandy-skeletal, mixed, mesic)—6 percent

### **Characteristics of the Celeton Soil**

*Position on landscape:* Back slopes and shoulder slopes of hills

*Parent material:* Kind—residuum; source—diatomaceous earth

*Slope features:* Length—short; shape—concave to convex

*Dominant present vegetation:* Shadscale, Bailey greasewood, Indian ricegrass

### **Typical Profile**

0 to 2 inches—very gravelly loam; 0 to 5 percent cobbles and stones, 60 to 75 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

2 to 5 inches—gravelly sandy loam, gravelly loam, loam; 0 to 5 percent cobbles and stones, 5 to 35 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM, ML, MH; estimated AASHTO classification—A-5

5 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 3 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Low

### **Characteristics of the Dumps**

*Position on landscape:* Mounds of diatomaceous earth

*Dominant present vegetation:* None

### **Characteristics of the Izo Soil**

*Position on landscape:* Channels

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—smooth

*Dominant present vegetation:* Rubber rabbitbrush, burrobrush, spiny hopsage

### **Typical Profile**

0 to 8 inches—very gravelly sand; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM, SP, SP-SM; estimated AASHTO classification—A-1

8 to 60 inches—stratified gravelly loamy sand to extremely gravelly coarse sand; 0 to 15 percent cobbles and stones, 65 to 85 percent pebbles (by weight); single grained; loose; nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP, GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Flooding:* Frequency—occasional; duration—very brief; months—December to August

*Permeability:* Rapid

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 6 inches

*Runoff:* Very slow

*Hydrologic group:* A

*Erosion factors (surface layer):* K value—.05; T value—5; wind erodibility group—3

*Hazard of erosion:* By water—severe; by wind—severe  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Low

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Summits of fan piedmont remnants

*Contrasting features:* Bedrock at a depth of more than 60 inches, hardpan within a depth of 20 inches

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### **Inclusion 2**

*Position on landscape:* Remnants of inset fans

*Contrasting features:* Bedrock at a depth of more than 60 inches, horizon of silica cementation

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Celeton Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—piping, hard to pack, thin layer

#### **Ratings of the Izo Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Severe—flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Celeton soil—VIIs, nonirrigated; Dumps—VIIIs; Izo soil—VIIw, nonirrigated

*Range site:* Celeton soil—027X027N; Izo soil—029X041N

## **6060—Wiskiflat gravelly loamy sand, 2 to 15 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Alluvial fans

*Elevation:* 5,400 to 6,400 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Wiskiflat gravelly loamy sand, 2 to 15 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Wiskiflat very stony loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—5 percent
- Inclusion 3: Durixerollic Haplargids, gravelly loamy sand, 4 to 15 percent slopes (Durixerollic Haplargids, fine-loamy, mixed, mesic)—3 percent

### **Characteristics of the Wiskiflat Soil**

*Position on landscape:* Alluvial fans

*Parent material:* Kind—alluvium; source—granitic rock with some influence from volcanic rock

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass, Nevada ephedra

### **Typical Profile**

0 to 10 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); single grained; loose; neutral (pH 6.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

10 to 60 inches—stratified very gravelly sandy loam to very gravelly coarse sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, rabbitbrush

#### **Inclusion 2**

*Position on landscape:* Fan collars  
*Slope features:* Length—very short; shape—convex  
*Contrasting features:* More than 3 percent stones on the surface

#### **Inclusion 3**

*Position on landscape:* Nonburied alluvial fan remnants  
*Contrasting features:* Layer of clay accumulation, layer of silica cementation, not flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, galleta

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Wiskiflat Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, too sandy, small stones  
*Shallow excavations:* Severe—cutbanks cave  
*Local roads and streets:* Moderate—flooding, slope, frost action  
*Roadfill:* Good  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* VIIs, nonirrigated  
*Range site:* 027X067N

## **6070—Breko-Crunker association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts  
*Elevation:* 6,000 to 7,000 feet  
*Average annual precipitation:* About 8 inches  
*Average annual air temperature:* About 52 degrees F  
*Frost-free season:* About 130 days

### **Composition**

#### *Major components:*

- Breko gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—70 percent
  - Crunker very gravelly sandy loam, 4 to 15 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—20 percent
- Contrasting inclusions:*
- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—8 percent
  - Inclusion 2: Terlco very gravelly fine sandy loam, 4 to 8 percent slopes (Typic Natrargids, fine-loamy, mixed, mesic)—2 percent

### **Characteristics of the Breko Soil**

*Position on landscape:* Summits of fan remnants  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

### **Typical Profile**

- 0 to 5 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; mildly alkaline (pH 7.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2
- 5 to 19 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2
- 19 to 60 inches—extremely gravelly sandy loam, extremely gravelly coarse sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, very

friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Crunker Soil

*Position on landscape:* Inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—smooth  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### Typical Profile

0 to 12 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1  
 12 to 60 inches—stratified gravelly coarse sand to extremely gravelly sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 8 inches

*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels  
*Contrasting features:* Occasionally flooded, no layer of clay accumulation  
*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Lower summits of fan piedmont remnants  
*Contrasting features:* Lower water-supplying capacity, SAR more than 13  
*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat  
**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Breko Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor  
*Range seeding:* Fair—too arid, small stones  
*Shallow excavations:* Moderate—slope  
*Local roads and streets:* Moderate—slope, frost action, shrink-swell  
*Roadfill:* Good  
*Sand:* Improbable source—small stones  
*Gravel:* Probable source  
*Embankments, dikes, and levees:* Severe—seepage

### Ratings of the Crunker Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—very poor; shallow water areas—very poor  
*Range seeding:* Poor—small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope, frost action, flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Breko soil—IVe, irrigated, and VIIc, nonirrigated; Crunker soil—IVs, irrigated, and VIIs, nonirrigated

*Range site:* Breko soil—029X006N; Crunker soil—029X049N

## **6071—Breko stony loamy sand, 4 to 15 percent slopes**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,600 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Breko stony loamy sand, 4 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Handpah stony loamy sand, 4 to 15 percent slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—8 percent

- Inclusion 2: Breko stony loamy sand, 15 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Typic Haplargids, stony sandy loam, 8 to 30 percent slopes (Typic Haplargids, loamy, mixed, mesic, shallow)—2 percent

### **Characteristics of the Breko Soil**

*Position on landscape:* Summits of fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

*Percent of surface covered by rock fragments:* 3 percent stones

### **Typical Profile**

0 to 6 inches—stony loamy sand; 5 to 15 percent

cobbles and stones, 20 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 21 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

21 to 29 inches—extremely gravelly sandy clay loam; 75 to 90 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GC; estimated AASHTO classification—A-2

29 to 60 inches—extremely gravelly sandy loam, extremely gravelly coarse sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.28; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Higher summits of fan piedmont remnants

*Slope features:* Length—long; shape—slightly convex

*Contrasting features:* Cemented pan within a depth of 20 inches

**Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants

*Slope features:* Length—short; shape—slightly concave

*Contrasting features:* Slopes of more than 15 percent

**Inclusion 3**

*Position on landscape:* Remnants of rock pediments

*Contrasting features:* Soft bedrock within a depth of 20 inches

*Distinctive present vegetation:* Spiny hopsage, shadscale, Nevada ephedra, galleta

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

**Ratings of the Breko Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Fair—too sandy

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—slope, frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* IVs, irrigated, and VIIs, nonirrigated

*Range site:* 029X006N

**6072—Breko-Wiskiflat association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,200 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Breko gravelly sandy loam, 2 to 8 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—50 percent

- Wiskiflat gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Breko gravelly sandy loam, 8 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Lathrop gravelly loamy sand, 2 to 8 percent slopes (Duric Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Koyen gravelly loamy sand, 2 to 8 percent slopes (Typic Camborthids, coarse-loamy, mixed, mesic)—3 percent
- Inclusion 4: Xerollic Paleargids, gravelly sandy loam, 2 to 8 percent slopes (Xerollic Paleargids, fine, montmorillonitic, mesic)—2 percent

**Characteristics of the Breko Soil**

*Position on landscape:* Summits of fan remnants and nonburied fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

**Typical Profile**

0 to 6 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 21 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

21 to 29 inches—extremely gravelly sandy clay loam; 75 to 90 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GC; estimated AASHTO classification—A-1

29 to 60 inches—extremely gravelly sandy loam, extremely gravelly coarse sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Wiskiflat Soil

*Position on landscape:* Inset fans and fan aprons  
*Parent material:* Kind—alluvium; source—granitic rock  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass, Nevada ephedra

### Typical Profile

0 to 10 inches—gravelly loamy sand; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); single grained; loose; neutral (pH 6.7); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 10 to 60 inches—stratified very gravelly sandy loam to very gravelly coarse sand; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; neutral (pH 7.3); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

### Soil and Water Features

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Moderately rapid  
*Available water capacity:* About 3 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.15; T value—5; wind erodibility group—3  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

#### Inclusion 2

*Position on landscape:* Lower summits of fan piedmont remnants

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### Inclusion 3

*Position on landscape:* Inset fans at lower elevations

*Contrasting features:* Less than 35 percent rock fragments throughout the profile

*Distinctive present vegetation:* Fourwing saltbush, winterfat, galleta

#### Inclusion 4

*Position on landscape:* Highest summits of fan piedmont remnants

*Contrasting features:* More than 35 percent clay at a depth of 4 to 14 inches, abrupt textural boundary

*Distinctive present vegetation:* Low sagebrush, Nevada ephedra, galleta

### Major Uses

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

### Ratings of the Breko Soil for Various Uses

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Fair—too arid, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Ratings of the Wiskiflat Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, too sandy

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—flooding, frost action

*Roadfill:* Good

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* Breko soil—IVe, irrigated, and VIIc, nonirrigated; Wiskiflat soil—VIIs, nonirrigated

*Range site:* Breko soil—029X006N; Wiskiflat soil—027X067N

**6073—Breko gravelly sandy loam, 2 to 8 percent slopes****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 5,300 to 5,800 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 53 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Breko gravelly sandy loam, 2 to 8 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—85 percent

*Contrasting inclusions:*

- Inclusion 1: Lathrop gravelly loamy sand, 2 to 8 percent slopes (Duric Haplargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Xerollic Paleargids, gravelly loamy sand, 4 to 15 percent slopes (Xerollic Paleargids, fine, montmorillonitic, mesic)—5 percent
- Inclusion 3: Wiskiflat gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic)—3 percent

**Characteristics of the Breko Soil**

*Position on landscape:* Summits of fan remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

**Typical Profile**

0 to 6 inches—gravelly sandy loam; 0 to 5 percent

cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 21 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

21 to 29 inches—extremely gravelly sandy clay loam; 75 to 90 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GC; estimated AASHTO classification—A-2

29 to 60 inches—extremely gravelly sandy loam, extremely gravelly coarse sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

**Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Lower summits of fan piedmont remnants

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

**Inclusion 2**

*Position on landscape:* Higher summits of fan piedmont remnants

*Contrasting features:* More than 35 percent clay at a depth of 8 to 11 inches, less than 35 percent rock fragments throughout the profile, abrupt textural boundary

**Inclusion 3**

*Position on landscape:* Inset fans and fan collars

*Contrasting features:* Layer of clay accumulation, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush, Nevada ephedra, desert needlegrass

**Major Uses**

**Current uses:** Rangeland, wildlife habitat

**Potential foreseeable uses:** Irrigated cropland if irrigation water is made available

**Ratings of the Breko Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Fair—too arid, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

**Interpretive Groups**

*Capability classification:* IVE, irrigated, and VIIc, nonirrigated

*Range site:* 029X006N

**6081—Handpah-Breko-Crunker association****Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 130 days

**Composition**

*Major components:*

- Handpah very gravelly sandy loam, 8 to 15 percent

slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—40 percent

- Breko gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—25 percent

- Crunker very gravelly sandy loam, 8 to 15 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Breko gravelly sandy loam, 2 to 4 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—9 percent

- Inclusion 2: Rattleflat gravelly sandy loam, 2 to 4 percent slopes (Xerollic Haplargids, coarse-loamy, mixed, mesic)—4 percent

- Inclusion 3: Xeric Torripsamments, gravelly sandy loam, 2 to 4 percent slopes (Xeric Torripsamments, mixed, mesic)—2 percent

**Characteristics of the Handpah Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta

**Typical Profile**

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 15 inches—gravelly clay loam, gravelly loam, gravelly sandy clay loam; 0 to 10 percent cobbles and stones, 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SC, GC; estimated AASHTO classification—A-6

15 to 24 inches—indurated hardpan

24 to 60 inches—cemented pan

**Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Medium  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Breko Soil**

*Position on landscape:* Inset fan remnants at highest elevations  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly convex  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

### **Typical Profile**

0 to 6 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2  
 6 to 21 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2  
 21 to 29 inches—extremely gravelly sandy clay loam; 75 to 90 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GC; estimated AASHTO classification—A-2  
 29 to 60 inches—extremely gravelly sandy loam, extremely gravelly coarse sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Slow  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Crunker Soil**

*Position on landscape:* Lower inset fans and remnants of inset fans  
*Parent material:* Mixed alluvium  
*Slope features:* Length—long; shape—slightly concave  
*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass, galleta

### **Typical Profile**

0 to 12 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 65 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM, GM; estimated AASHTO classification—A-1  
 12 to 60 inches—stratified gravelly coarse sand to extremely gravelly sandy loam; 5 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

### **Soil and Water Features**

*Depth to bedrock:* More than 60 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* Rare  
*Permeability:* Rapid  
*Available water capacity:* About 4 inches  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Medium  
*Hydrologic group:* B  
*Erosion factors (surface layer):* K value—.10; T value—5; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Lower fan piedmont remnants and inset fan remnants

*Contrasting features:* Slopes of less than 4 percent

#### **Inclusion 2**

*Position on landscape:* Lower fan aprons, mostly in Rattlesnake Flat and Garfield Flat areas

*Contrasting features:* No cemented pan throughout the profile, slopes of less than 4 percent, average of less than 35 percent rock fragments between depths of 0 and 40 inches

#### **Inclusion 3**

*Position on landscape:* Inset fans

*Contrasting features:* Slopes of less than 4 percent, sandy textures below a depth of 5 inches, average of less than 35 percent rock fragments throughout the profile

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

#### **Ratings of the Handpah Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Breko Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Fair—too arid, small stones

*Shallow excavations:* Moderate—slope

*Local roads and streets:* Moderate—slope, frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Crunker Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops

(irrigated)—poor; domestic grasses and legumes

(irrigated)—poor; wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair;

wetland plants—very poor; shallow water areas—very poor

*Range seeding:* Poor—small stones

*Shallow excavations:* Severe—cutbanks cave

*Local roads and streets:* Moderate—slope, frost action, flooding

*Roadfill:* Good

*Sand:* Probable source

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Handpah soil—VIIIs, nonirrigated; Breko soil—IVe, irrigated, and VIIC, nonirrigated; Crunker soil—IVs, irrigated, and VIIIs, nonirrigated

*Range site:* Handpah soil—029X006N; Breko soil—029X006N; Crunker soil—029X049N

## **6082—Handpah-Breko association**

### **Map Unit Setting**

*Position on landscape:* Fan piedmonts

*Elevation:* 6,000 to 7,000 feet

*Average annual precipitation:* About 8 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 130 days

### **Composition**

*Major components:*

- Handpah gravelly sandy loam, 2 to 8 percent slopes (Xerollic Durargids, loamy, mixed, mesic, shallow)—50 percent
- Breko gravelly sandy loam, 2 to 8 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—40 percent

*Contrasting inclusions:*

- Inclusion 1: Crunker very gravelly sandy loam, 2 to 8 percent slopes (Durorthidic Xeric Torriorthents, sandy-skeletal, mixed, mesic)—7 percent
- Inclusion 2: Breko stony loamy sand, 8 to 30 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Handpah Soil**

*Position on landscape:* Summits of fan piedmont remnants

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta

### Typical Profile

0 to 6 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; slightly hard, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 4); estimated Unified classification—SM, GM; estimated AASHTO classification—A-2

6 to 17 inches—gravelly clay loam, gravelly loam, gravelly sandy clay loam; 0 to 10 percent cobbles and stones, 25 to 40 percent pebbles (by weight); subangular blocky structure; hard, friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SC, GC; estimated AASHTO classification—A-6

17 to 19 inches—very gravelly sandy loam; 10 to 25 percent cobbles and stones, 55 to 75 percent pebbles (by weight); massive; hard, firm; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM, GM; estimated AASHTO classification—A-1

19 to 22 inches—indurated hardpan

22 to 60 inches—cemented pan

### Soil and Water Features

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Breko Soil

*Position on landscape:* Remnants of inset fans

*Parent material:* Mixed alluvium

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, spiny hopsage, galleta, Indian ricegrass

### Typical Profile

0 to 6 inches—gravelly sandy loam; 0 to 5 percent cobbles and stones, 25 to 45 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 7.9); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 21 inches—very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam; 50 to 75 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GC; estimated AASHTO classification—A-2

21 to 29 inches—extremely gravelly sandy clay loam; 75 to 90 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GC; estimated AASHTO classification—A-2

29 to 60 inches—extremely gravelly sandy loam, extremely gravelly coarse sandy loam; 75 to 90 percent pebbles (by weight); massive; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 6); estimated Unified classification—GP-GM; estimated AASHTO classification—A-1

### Soil and Water Features

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 4 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Slow

*Hydrologic group:* B

*Erosion factors (surface layer):* K value—.24; T value—5; wind erodibility group—4

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Lower remnants of inset fans

*Contrasting features:* No layer of clay accumulation, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, Indian ricegrass

### **Inclusion 2**

*Position on landscape:* Side slopes of fan piedmont remnants

*Contrasting features:* Slopes of more than 8 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Ratings of the Handpah Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—too arid, droughty, small stones

*Shallow excavations:* Severe—cemented pan

*Local roads and streets:* Severe—cemented pan

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Ratings of the Breko Soil for Various Uses**

*Wildlife habitat elements:* Grain and seed crops (irrigated)—poor; domestic grasses and legumes (irrigated)—poor; wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair; wetland plants—poor; shallow water areas—very poor

*Range seeding:* Fair—too arid, small stones

*Shallow excavations:* Slight

*Local roads and streets:* Moderate—frost action, shrink-swell

*Roadfill:* Good

*Sand:* Improbable source—small stones

*Gravel:* Probable source

*Embankments, dikes, and levees:* Severe—seepage

### **Interpretive Groups**

*Capability classification:* Handpah soil—VII<sub>s</sub>, nonirrigated; Breko soil—IV<sub>e</sub>, irrigated, and VII<sub>c</sub>, nonirrigated

*Range site:* Handpah soil—029X006N; Breko soil—029X006N

## **6092—Beelem-Wassit association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,400 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

- Beelem very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—60 percent

- Wassit very stony sandy loam, 50 to 75 percent slopes (Lithic Mollic Haploxeralfs, loamy-skeletal, mixed, frigid)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—7 percent

- Inclusion 2: Gabbro very gravelly sandy loam, moist, 30 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### **Characteristics of the Beelem Soil**

*Position on landscape:* Highly eroded side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Wassit Soil**

*Position on landscape:* North-facing side slopes of mountains at upper elevations

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—slightly concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, pine bluegrass

*Percent of surface covered by rock fragments:* 10 percent stones

### **Typical Profile**

0 to 6 inches—very stony sandy loam; 25 to 45 percent cobbles and stones, 45 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

6 to 12 inches—very gravelly loam, very gravelly clay loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

12 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### **Inclusion 2**

*Position on landscape:* Lower south- and west-facing side slopes of mountains

*Contrasting features:* Layer of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta

#### **Inclusion 3**

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### **Woodland**

*Site index for common trees on the Beelem soil:*

Singleleaf pinyon—30; Utah juniper—30

*Site index for common trees on the Wassit soil:*

Singleleaf pinyon—38

*Most important native understory plants:* Beelem—Wyoming big sagebrush; Wassit—mountain big sagebrush

#### **Ratings of the Beelem Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Wassit Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Beelem soil—VIIs, nonirrigated;

Wassit soil—VIIs, nonirrigated

*Woodland suitability group:* Beelem soil—1R; Wassit soil—1R

## **6093—Beelem-Stewval-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,400 to 7,800 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 105 days

### **Composition**

*Major components:*

- Beelem very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—40 percent
- Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—30 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Lomoiné very gravelly sandy loam, dry, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—6 percent
- Inclusion 2: Bellehelen very gravelly fine sandy loam, 50 to 75 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 3: Gabbvally very stony sandy loam, moist, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (sandy-skeletal, mixed, mesic)—2 percent

### **Characteristics of the Beelem Soil**

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rock

*Slope features:* Length—long; shape—slightly concave to slightly convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, black sagebrush, Wyoming big sagebrush

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Stewval Soil**

*Position on landscape:* Back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff and andesite

*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

### **Typical Profile**

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable;

moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

4 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Rock Outcrop

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* South-facing back slopes of mountains

*Contrasting features:* No layer of clay accumulation, lower water-supplying capacity

#### Inclusion 2

*Position on landscape:* North-facing back slopes of mountains

*Contrasting features:* Higher water-supplying capacity, thick dark surface layer

#### Inclusion 3

*Position on landscape:* South- and west-facing back slopes of mountains

*Slope features:* Length—short; shape—slightly concave

*Contrasting features:* Layer of clay accumulation, noncalcareous throughout the profile

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, Nevada ephedra

### Inclusion 4

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat, grazable woodland

### Woodland

*Site index for common trees on the Beelem soil:*

Singleleaf pinyon—30; Utah juniper—30

*Most important native understory plants:* Beelem soil—Black sagebrush, Wyoming big sagebrush

### Ratings of the Beelem Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Stewval Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Beelem soil—VIIs, nonirrigated; Stewval soil—VIIs, nonirrigated; Rock outcrop—VIIIs

*Range site:* Stewval soil—029X014N

*Woodland suitability group:* Beelem soil—1R

## 6094—Beelem-Bellehelen-Stewval association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 6,400 to 8,000 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 100 days

### Composition

*Major components:*

- Beelem very gravelly sandy loam, 30 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [noncalcareous], mesic)—35 percent
- Bellehelen very stony loam, 30 to 75 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—30 percent
- Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—20 percent

*Contrasting inclusions:*

- Inclusion 1: Gabbvally very stony fine sandy loam, moist, 50 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Typic Haploxeralfs, very stony fine sandy loam, 30 to 50 percent slopes (Typic Haploxeralfs, clayey-skeletal, mixed, mesic)—4 percent
- Inclusion 3: Xerollic Haplargids, very gravelly sandy loam, 30 to 75 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic)—3 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### Characteristics of the Beelem Soil

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—welded tuff and altered granitic rock

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Utah juniper, singleleaf pinyon, black sagebrush

*Percent of surface covered by rock fragments:* 40 percent pebbles, 5 percent cobbles

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less

than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2

3 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 9 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Bellehelen Soil

*Position on landscape:* North-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Singleleaf pinyon, black sagebrush, Sandberg bluegrass

### Typical Profile

0 to 5 inches—very stony loam; 10 to 40 percent cobbles and stones, 35 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-GM; estimated AASHTO classification—A-4

5 to 11 inches—very gravelly loam, very gravelly sandy clay loam, very gravelly clay loam; 0 to 25 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated

Unified classification—GM-GC, GC; estimated  
AASHTO classification—A-2  
11 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 7 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately slow  
*Available water capacity:* About 2 inches  
*Water-supplying capacity:* About 9 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Characteristics of the Stewval Soil

*Position on landscape:* Back slopes and shoulder slopes of mountains  
*Parent material:* Kind—residuum and colluvium; source—rhyolitic tuff and andesite  
*Slope features:* Length—short; shape—convex to concave  
*Dominant present vegetation:* Black sagebrush, galleta, Sandberg bluegrass, Nevada ephedra

### Typical Profile

0 to 1 inch—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2  
1 to 4 inches—extremely gravelly loam, very gravelly clay loam, very gravelly loam; 0 to 25 percent cobbles and stones, 55 to 85 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2  
4 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 4 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* South-facing back slopes of mountains  
*Slope features:* Shape—slightly concave  
*Contrasting features:* Layer of clay accumulation, noncalcareous throughout the profile, no thick dark surface horizon  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, Nevada ephedra, galleta

#### Inclusion 2

*Position on landscape:* North-facing back slopes of mountains  
*Slope features:* Shape—slightly concave  
*Contrasting features:* Average of more than 35 percent clay throughout the profile, bedrock at a depth of more than 20 inches

#### Inclusion 3

*Position on landscape:* Back slopes of mountains  
*Slope features:* Length—short; shape—concave  
*Contrasting features:* Bedrock at a depth of more than 20 inches  
*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage, Nevada ephedra

#### Inclusion 4

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### Other inclusions (in only a few areas):

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface

### Major Uses

**Current uses:** Rangeland, wildlife habitat, grazable woodland

**Woodland**

*Site index for common trees on the Beelem soil:*

Singleleaf pinyon—30; Utah juniper—30

*Site index for common trees on the Bellehelen soil:*

Singleleaf pinyon—35; Utah juniper—35

*Most important native understory plants:* Beelem—

Wyoming big sagebrush, black sagebrush;

Bellehelen—black sagebrush, pine bluegrass

**Ratings of the Beelem Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, depth to bedrock, small stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Bellehelen Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, erodes easily, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Stewval Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

**Interpretive Groups**

*Capability classification:* Beelem soil—VIIIs, nonirrigated;

Bellehelen soil—VIIIs, nonirrigated; Stewval soil—VIIIs, nonirrigated

*Range site:* Stewval soil—029X014N

*Woodland suitability group:* Beelem soil—1R; Bellehelen soil—1R

**7000—Logring-Kyler association, steep****Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 6,500 to 8,000 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 51 degrees F

*Frost-free season:* About 115 days

**Composition**

*Major components:*

- Logring very gravelly fine sandy loam, 30 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—50 percent
- Kyler very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—8 percent
- Inclusion 2: Logring very gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Logring Soil**

*Position on landscape:* Back slopes adjacent to rock outcrop and north-facing back slopes of mountains

*Parent material:* Kind—residuum; source—limestone and dolomite

*Slope features:* Length—long; shape—slightly convex to slightly concave

*Dominant present vegetation:* Utah juniper, black sagebrush, pine bluegrass

**Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 13 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

13 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 7 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### Characteristics of the Kyler Soil

*Position on landscape:* Crests, shoulder slopes, and back slopes of mountains

*Parent material:* Kind—residuum; source—limestone and dolomite

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass

#### Typical Profile

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2

3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4

7 inches—unweathered bedrock

#### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

#### Contrasting Inclusions

##### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

##### Inclusion 2

*Position on landscape:* Back slopes of mountains

*Contrasting features:* Slopes of more than 50 percent

##### Inclusion 3

*Position on landscape:* Channels

*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded

*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### Major Uses

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### Woodland

*Site index for common trees on the Logring soil:* Utah juniper—38

*Most important native understory plants:* Logring—black sagebrush, green ephedra, bottlebrush squirreltail, bluegrass

#### Ratings of the Logring Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

#### **Ratings of the Kyler Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### **Interpretive Groups**

*Capability classification:* Logring soil—VIIs, nonirrigated; Kyler soil—VIIs, nonirrigated  
*Range site:* Kyler soil—029X014N  
*Woodland suitability group:* Logring soil—1R

### **7001—Logring-Kyler association**

#### **Map Unit Setting**

*Position on landscape:* Hills  
*Elevation:* 6,400 to 7,000 feet  
*Average annual precipitation:* About 10 inches  
*Average annual air temperature:* About 50 degrees F  
*Frost-free season:* About 115 days

#### **Composition**

*Major components:*

- Logring very gravelly fine sandy loam, 8 to 30 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—60 percent
- Kyler very gravelly fine sandy loam, 4 to 15 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—25 percent

*Contrasting inclusions:*

- Inclusion 1: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Rock outcrop—4 percent
- Inclusion 3: Stewval very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—4 percent

- Inclusion 4: Lomoine very gravelly sandy loam, 2 to 8 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, mixed [calcareous], mesic)—2 percent

#### **Characteristics of the Logring Soil**

*Position on landscape:* Back slopes of hills  
*Parent material:* Kind—residuum; source—limestone and dolomite  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Utah juniper, black sagebrush, pine bluegrass

#### **Typical Profile**

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 13 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

13 inches—unweathered bedrock

#### **Soil and Water Features**

*Depth to bedrock:* 7 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

#### **Characteristics of the Kyler Soil**

*Position on landscape:* Crests and shoulder slopes of hills  
*Parent material:* Kind—residuum; source—limestone

*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, Nevada  
 ephedra, galleta, pine bluegrass

### Typical Profile

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2  
 3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4  
 7 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Rabbitbrush, Wyoming big sagebrush

#### Inclusion 2

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### Inclusion 3

*Position on landscape:* Low hills underlain by volcanic rock

*Contrasting features:* Layer of clay accumulation, less calcium carbonate throughout the profile

#### Inclusion 4

*Position on landscape:* Low hills underlain by volcanic rock  
*Contrasting features:* Less calcium carbonate throughout the profile

### Major Uses

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### Woodland

*Site index for common trees on the Logring soil:* Utah juniper—38  
*Most important native understory plants:* Logring—black sagebrush, green ephedra, bottlebrush squirreltail, bluegrass

### Ratings of the Logring Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Kyler Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Severe—depth to bedrock  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones, thin layer

### Interpretive Groups

*Capability classification:* Logring soil—VIIs, nonirrigated; Kyler soil—VIIs, nonirrigated  
*Range site:* Kyler soil—029X014N  
*Woodland suitability group:* Logring soil—1D

## 7002—Logring-Eaglepass-Kyler complex, 15 to 75 percent slopes

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 7,000 to 8,000 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 50 degrees F

*Frost-free season:* About 110 days

### Composition

*Major components:*

- Logring very gravelly sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—45 percent
- Eaglepass very stony sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—25 percent
- Kyler very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—9 percent
- Inclusion 2: Wrango very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent
- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 4 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—3 percent

### Characteristics of the Logring Soil

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—concave to convex

*Dominant present vegetation:* Utah juniper, black sagebrush, pine bluegrass

### Typical Profile

0 to 3 inches—very gravelly sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

3 to 13 inches—very gravelly loam, very gravelly fine sandy loam; 0 to 10 percent cobbles and stones, 55 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; strongly alkaline

(pH 8.6); nonsaline (less than 4 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC; estimated AASHTO classification—A-2

13 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 7 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 8 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Eaglepass Soil

*Position on landscape:* North-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—limestone and dolomite

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Littleleaf mountainmahogany, black sagebrush, Nevada greasewood

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 1 inch—very stony sandy loam; 15 to 30 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1

1 to 3 inches—extremely stony loam, very cobbly fine sandy loam, extremely gravelly sandy loam; 25 to 45 percent cobbles and stones, 40 to 75 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-1, A-2

3 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 3 to 6 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* Less than 1 inch  
*Water-supplying capacity:* About 4 inches  
*Runoff:* Very rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—8  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

**Characteristics of the Kyler Soil**

*Position on landscape:* Shoulder slopes and ridges of mountains  
*Parent material:* Kind—residuum and colluvium; source—limestone  
*Slope features:* Length—short; shape—convex  
*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, pine bluegrass

**Typical Profile**

0 to 3 inches—very gravelly fine sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); platy structure; soft, very friable; moderately alkaline (pH 8.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-1, A-2  
 3 to 7 inches—very cobbly loam, very gravelly loam; 25 to 40 percent cobbles and stones, 35 to 50 percent pebbles (by weight); massive; soft, very friable; strongly alkaline (pH 8.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM, GM-GC, SM, SM-SC; estimated AASHTO classification—A-2, A-4  
 7 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* More than 6 to 14 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderate  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 7 inches  
*Runoff:* Rapid  
*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

**Contrasting Inclusions****Inclusion 1**

*Position on landscape:* Scattered small peaks and ridges  
*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

**Inclusion 2**

*Position on landscape:* Inset fans  
*Contrasting features:* Bedrock at a depth of more than 60 inches  
*Distinctive present vegetation:* Black sagebrush, spiny hopsage, Indian ricegrass

**Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

**Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

**Woodland**

*Site index for common trees on the Logring soil:* Utah juniper—38  
*Most important native understory plants:* Logring—black sagebrush, green ephedra, bottlebrush squirreltail, bluegrass

**Ratings of the Logring Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

**Ratings of the Eaglepass Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Ratings of the Kyler Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, small stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Interpretive Groups**

*Capability classification:* Logring soil—VIIs, nonirrigated; Eaglepass soil—VIIs, nonirrigated; Kyler soil—VIIs, nonirrigated

*Range site:* Eaglepass soil—029X040N; Kyler soil—029X014N

*Woodland suitability group:* Logring soil—1R

## **7010—Armoine-Beelem association**

### **Map Unit Setting**

*Position on landscape:* Hills and rock pediments

*Elevation:* 6,800 to 7,800 feet

*Average annual precipitation:* About 11 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

### **Composition**

*Major components:*

- Armoine very gravelly sandy loam, 4 to 15 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—50 percent

- Beelem gravelly sandy loam, 15 to 30 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—35 percent

*Contrasting inclusions:*

- Inclusion 1: Veet gravelly sandy loam, 2 to 8 percent slopes (Xerollic Camborthids, loamy-skeletal, mixed, mesic)—5 percent

- Inclusion 2: Rock outcrop—4 percent

- Inclusion 3: Xeric Torriorthents, very gravelly loamy sand, 2 to 8 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—4 percent

- Inclusion 4: Armoine very gravelly sandy loam, 15 to 50 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—2 percent

### **Characteristics of the Armoine Soil**

*Position on landscape:* Crests and shoulder slopes of hills, summits and shoulder slopes of rock pediments

*Parent material:* Kind—residuum and colluvium; source—granitic rock

*Slope features:* Length—short; shape—convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, Sandberg bluegrass

### **Typical Profile**

0 to 4 inches—very gravelly sandy loam; 5 to 10 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

4 to 15 inches—very gravelly sandy clay loam, very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-2

15 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.05; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Beelem Soil**

*Position on landscape:* Back slopes and shoulder slopes of hills and pediment remnants  
*Parent material:* Kind—residuum and colluvium; source—altered granitic rocks  
*Slope features:* Length—short; shape—slightly convex  
*Dominant present vegetation:* Utah juniper, black sagebrush

### **Typical Profile**

0 to 1 inch—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 1 to 3 inches—gravelly sandy loam; 0 to 10 percent cobbles and stones, 25 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; moderately alkaline (pH 8.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-2  
 3 inches—unweathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 3 to 9 inches  
*Depth to seasonal high water table:* More than 60 inches  
*Frequency of flooding:* None  
*Permeability:* Moderately rapid  
*Available water capacity:* About 1 inch  
*Water-supplying capacity:* About 8 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—4  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—high; concrete—low  
*Potential for frost action:* Moderate

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Inset fans  
*Contrasting features:* Bedrock at a depth of more than 60 inches, rarely flooded

*Distinctive present vegetation:* Wyoming big sagebrush, Indian ricegrass, galleta

#### **Inclusion 2**

*Position on landscape:* Scattered small peaks and ridges on hills and back slopes of rock pediment remnants

*Contrasting features:* Bedrock exposed at the surface  
*Distinctive present vegetation:* None

#### **Inclusion 3**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush, rabbitbrush

#### **Inclusion 4**

*Position on landscape:* Back slopes of hills  
*Contrasting features:* Slopes of more than 15 percent

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### **Woodland**

*Site index for common trees on the Beelem soil:* Singleleaf pinyon—30; Utah juniper—30  
*Most important native understory plants:* Beelem—black sagebrush, Wyoming big sagebrush, green ephedra, Indian ricegrass, bottlebrush squirreltail

#### **Ratings of the Armoine Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—small stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock  
*Local roads and streets:* Moderate—depth to bedrock, frost action, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—seepage

#### **Ratings of the Beelem Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—poor; shrubs (nonirrigated)—fair  
*Range seeding:* Poor—droughty, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Armoine soil—VIIs, nonirrigated;  
Beelem soil—VIIs, nonirrigated

*Range site:* Armoine soil—029X014N

*Woodland suitability group:* Beelem soil—1D

## **7012—Armoine-Petspring association**

### **Map Unit Setting**

*Position on landscape:* Hills, mountains, and rock pediments

*Elevation:* 6,500 to 7,600 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 120 days

### **Composition**

*Major components:*

- Armoine very cobbly sandy loam, 15 to 50 percent slopes (Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow)—70 percent
- Petspring very bouldery coarse sandy loam, 50 to 75 percent slopes (Xeric Torriorthents, loamy-skeletal, mixed, nonacid, mesic, shallow)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Kyler very gravelly fine sandy loam, 15 to 50 percent slopes (Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic)—5 percent
- Inclusion 3: Xeric Torriorthents, sandy loam, 4 to 15 percent slopes (Xeric Torriorthents, coarse-loamy, mixed, mesic)—3 percent
- Inclusion 4: Pumel very gravelly sandy loam, 8 to 30 percent slopes (Typic Torriorthents, loamy-skeletal, mixed [calcareous], mesic, shallow)—2 percent

### **Characteristics of the Armoine Soil**

*Position on landscape:* Low hills, pediments, and side slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—altered granitic rock

*Slope features:* Length—long; shape—slightly concave to convex

*Dominant present vegetation:* Black sagebrush, Nevada ephedra, galleta, Sandberg bluegrass

### **Typical Profile**

0 to 5 inches—very cobbly sandy loam; 25 to 40 percent cobbles and stones, 35 to 60 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline

(less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

5 to 15 inches—very gravelly sandy clay loam, very gravelly sandy loam; 0 to 5 percent cobbles and stones, 50 to 70 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM-SC, SM; estimated AASHTO classification—A-2

15 inches—weathered bedrock

### **Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Medium

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Petspring Soil**

*Position on landscape:* South-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—altered granitic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass

*Percent of surface covered by rock fragments:* 10 percent stones, 5 percent boulders

### **Typical Profile**

0 to 1 inch—very bouldery coarse sandy loam; 15 to 30 percent cobbles and stones, 50 to 75 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SP-SM, SM; estimated AASHTO classification—A-1

1 to 3 inches—very gravelly coarse sandy loam; 0 to 15 percent cobbles and stones, 50 to 70 percent pebbles (by weight); single grained; loose; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm);

nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1

3 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 3 to 10 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately rapid

*Available water capacity:* Less than 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Side slopes of mountains underlain by limestone

*Contrasting features:* More calcium carbonate throughout the profile

#### Inclusion 3

*Position on landscape:* Inset fans

*Contrasting features:* Bedrock at a depth of more than 60 inches, rarely flooded

#### Inclusion 4

*Position on landscape:* South-facing side slopes of hills and mountains at lower elevations

*Contrasting features:* Lower water-supplying capacity, no layer of clay accumulation

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

#### Other inclusions (in only a few areas)

• Uripnes very bouldery sandy loam, 50 to 75 percent slopes

*Position on landscape:* South-facing side slopes of mountains at lower elevations

*Contrasting features:* Slopes of more than 50 percent, lower water-supplying capacity

*Distinctive present vegetation:* Anderson wolfberry, littleleaf horsebrush, desert needlegrass

• Eaglepass very stony sandy loam, 30 to 50 percent slopes

*Position on landscape:* Side slopes of mountains underlain by limestone

*Contrasting features:* More calcium carbonate throughout the profile

*Distinctive present vegetation:* Littleleaf mountainmahogany, Nevada greasebush, black sagebrush

### Major Uses

**Current uses:** Rangeland, wildlife habitat

#### Ratings of the Armoine Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—seepage, thin layer

#### Ratings of the Petspring Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Armoine soil—VIIs, nonirrigated; Petspring soil—VIIs, nonirrigated

*Range site:* Armoine soil—029X014N; Petspring soil—027X065N

### 7020—Squawtip-Brier-Rock outcrop association

#### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 7,000 to 8,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 47 degrees F

*Frost-free season:* About 90 days

### Composition

#### Major components:

- Squawtip very stony loam, 30 to 50 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid)—50 percent
- Brier very stony loam, 15 to 30 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—25 percent
- Rock outcrop—10 percent

#### Contrasting inclusions:

- Inclusion 1: Aridic Argixerolls, extremely stony sandy loam, 50 to 75 percent slopes (Aridic Argixerolls, loamy-skeletal, mixed, mesic)—6 percent
- Inclusion 2: Beelem gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—5 percent
- Inclusion 3: Stewval very gravelly sand, 8 to 30 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—2 percent
- Inclusion 4: Lithic Argixerolls, very gravelly sandy loam, 30 to 75 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, frigid)—2 percent

### Characteristics of the Squawtip Soil

*Position on landscape:* Back slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, Sandberg bluegrass

*Percent of surface covered by rock fragments:* 30 percent pebbles, 10 percent cobbles, 8 percent stones

#### Typical Profile

0 to 10 inches—very stony loam; 30 to 50 percent cobbles and stones, 15 to 30 percent pebbles (by weight); subangular blocky structure; soft, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

10 to 31 inches—very cobbly loam, very gravelly sandy clay loam, very gravelly sandy loam; 10 to 45 percent cobbles and stones, 45 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, SM-SC; estimated AASHTO classification—A-2

31 inches—weathered bedrock

### Soil and Water Features

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Brier Soil

*Position on landscape:* Crests and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium;  
source—volcanic rock

*Slope features:* Length—long; shape—convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

*Percent of surface covered by rock fragments:* 25 percent pebbles, 10 percent cobbles, 3 percent stones

#### Typical Profile

0 to 7 inches—very stony loam; 30 to 50 percent cobbles and stones, 40 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2, A-4

7 to 15 inches—very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam; 30 to 45 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Back slopes of mountains

*Contrasting features:* Slopes of more than 50 percent, more than 15 percent stones on the surface, bedrock at a depth of more than 20 inches

#### **Inclusion 2**

*Position on landscape:* Lower south-, east-, and west-facing back slopes of mountains

*Slope features:* Length—short; shape—slightly convex

*Contrasting features:* No layer of clay accumulation, slopes of more than 50 percent, lower water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* Crests and shoulder slopes of mountains at lower elevations

*Contrasting features:* Lower water-supplying capacity

*Distinctive present vegetation:* Black sagebrush

#### **Inclusion 4**

*Position on landscape:* Upper north-facing back slopes of mountains (located on Miller Mountain only)

*Contrasting features:* Lower mean annual soil temperature

*Distinctive present vegetation:* Mountain big sagebrush, pine bluegrass

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### **Woodland**

*Site index for common trees on the Squawtip soil:*

Singleleaf pinyon—75

*Site index for common trees on the Brier soil:* Singleleaf pinyon—30; Utah juniper—30

*Most important native understory plants:* Squawtip soil—mountain big sagebrush, Thurber needlegrass; Brier soil—Wyoming big sagebrush, Thurber needlegrass

### **Ratings of the Squawtip Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—good; coniferous plants

(nonirrigated)—good; shrubs (nonirrigated)—good

*Range seeding:* Poor—large stones

*Shallow excavations:* Severe—slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Brier Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; coniferous plants

(nonirrigated)—poor; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Interpretive Groups**

*Capability classification:* Squawtip soil—VII<sub>s</sub>, nonirrigated; Brier soil—VII<sub>s</sub>, nonirrigated; Rock outcrop—VIII<sub>s</sub>

*Woodland suitability group:* Squawtip soil—2R; Brier soil—1X

## **7021—Squawtip-Gabbvally-Rock outcrop association**

### **Map Unit Setting**

*Position on landscape:* Mountains

*Elevation:* 7,000 to 8,000 feet

*Average annual precipitation:* About 12 inches

*Average annual air temperature:* About 49 degrees F

*Frost-free season:* About 100 days

### **Composition**

*Major components:*

• Squawtip very stony loam, 30 to 50 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid)—50 percent

- Gabbvally very stony loam, moist, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—20 percent
- Rock outcrop—15 percent

*Contrasting inclusions:*

- Inclusion 1: Bellehelen very stony loam, 30 to 50 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—5 percent
- Inclusion 2: Beelem gravelly sandy loam, 50 to 75 percent slopes (Lithic Xeric Torriorthents, loamy, mixed [calcareous], mesic)—5 percent
- Inclusion 3: Typic Argixerolls, very stony loam, 50 to 75 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid)—3 percent
- Inclusion 4: Xeric Torriorthents, very gravelly loamy sand, 8 to 15 percent slopes (Xeric Torriorthents, sandy-skeletal, mixed, mesic)—2 percent

**Characteristics of the Squawtip Soil**

*Position on landscape:* North- and east-facing side slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, Sandberg bluegrass

*Percent of surface covered by rock fragments:* 10 percent stones

**Typical Profile**

0 to 5 inches—very stony loam; 30 to 50 percent cobbles and stones, 15 to 30 percent pebbles (by weight); subangular blocky structure; soft, very friable; slightly acid (pH 6.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

5 to 38 inches—very cobbly loam, very gravelly sandy clay loam, very gravelly sandy loam; 10 to 45 percent cobbles and stones, 45 to 55 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, SM-SC; estimated AASHTO classification—A-2

38 inches—weathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 20 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 3 inches

*Water-supplying capacity:* About 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.15; T value—2; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Gabbvally Soil**

*Position on landscape:* South-, east-, and west-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—short; shape—slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta

*Percent of surface covered by rock fragments:* 5 percent stones

**Typical Profile**

0 to 2 inches—very stony loam; 10 to 40 percent cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Runoff:* Very rapid  
*Hazard of erosion:* By water—severe; by wind—slight  
*Shrink-swell potential:* Low  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges  
*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Back slopes of mountains  
*Contrasting features:* Hard bedrock within a depth of 20 inches, higher water-supplying capacity than the Gabbvally soil

#### **Inclusion 2**

*Position on landscape:* Eroded south-, west-, and east-facing back slopes of mountains  
*Slope features:* Length—short; shape—slightly convex  
*Contrasting features:* No layer of clay accumulation  
*Distinctive present vegetation:* Utah juniper, black sagebrush, Wyoming big sagebrush

#### **Inclusion 3**

*Position on landscape:* North-facing back slopes of mountains  
*Contrasting features:* Slopes of more than 50 percent, bedrock at a depth of more than 40 inches

#### **Inclusion 4**

*Position on landscape:* Channels  
*Contrasting features:* Bedrock at a depth of more than 60 inches, occasionally flooded  
*Distinctive present vegetation:* Wyoming big sagebrush

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### **Woodland**

*Site index for common trees on the Squawtip soil:*  
 Singleleaf pinyon—75

*Most important native understory plants:* Squawtip soil—mountain big sagebrush

### **Ratings of the Squawtip Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—good; coniferous plants (nonirrigated)—good; shrubs (nonirrigated)—good  
*Range seeding:* Poor—large stones  
*Shallow excavations:* Severe—slope  
*Local roads and streets:* Severe—slope  
*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—large stones

### **Ratings of the Gabbvally Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor  
*Range seeding:* Poor—droughty, large stones, depth to bedrock  
*Shallow excavations:* Severe—depth to bedrock, slope  
*Local roads and streets:* Severe—depth to bedrock, slope  
*Roadfill:* Poor—depth to bedrock, slope  
*Sand:* Improbable source—excess fines  
*Gravel:* Improbable source—excess fines  
*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Squawtip soil—VIIIs, nonirrigated; Gabbvally soil—VIIIs, nonirrigated; Rock outcrop—VIIIs  
*Range site:* Gabbvally soil—029X010N  
*Woodland suitability group:* Squawtip soil—2R

## **8030—Ravenswood-Brier-Itca association**

### **Map Unit Setting**

*Position on landscape:* Mountains  
*Elevation:* 7,200 to 8,400 feet  
*Average annual precipitation:* About 13 inches  
*Average annual air temperature:* About 47 degrees F  
*Frost-free season:* About 90 days

### **Composition**

#### *Major components:*

- Ravenswood very stony loam, 15 to 50 percent slopes (Typic Argixerolls, clayey-skeletal, montmorillonitic, frigid)—40 percent
- Brier very stony loam, 30 to 50 percent slopes (Lithic Argixerolls, loamy-skeletal, mixed, mesic)—25 percent
- Itca very stony loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid)—20 percent

#### *Contrasting inclusions:*

- Inclusion 1: Rock outcrop—5 percent
- Inclusion 2: Xeric Torriorthents, stony clay loam, 30 to 75 percent slopes (Xeric Torriorthents, clayey, montmorillonitic, mesic, shallow)—5 percent
- Inclusion 3: Gabbvally very stony sandy loam, moist, 30 to 50 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—5 percent

**Characteristics of the Ravenswood Soil**

*Position on landscape:* Back slopes and shoulder slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave to convex

*Dominant present vegetation:* Singleleaf pinyon, mountain big sagebrush, antelope bitterbrush, Utah juniper, pine bluegrass

*Percent of surface covered by rock fragments:* 20 percent pebbles, 20 percent cobbles, 8 percent stones

**Typical Profile**

0 to 10 inches—very stony loam; 15 to 25 percent cobbles and stones, 0 to 25 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.6); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL-ML; estimated AASHTO classification—A-4

10 to 13 inches—very gravelly clay loam; 5 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); angular blocky structure; slightly hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2

13 to 30 inches—very gravelly clay, very gravelly clay loam; 5 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); angular blocky structure; very hard, friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-7

30 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 30 to 40 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 5 inches

*Water-supplying capacity:* About 11 inches

*Runoff:* Rapid

*Hydrologic group:* C

*Erosion factors (surface layer):* K value—.24; T value—2; wind erodibility group—6

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

**Characteristics of the Brier Soil**

*Position on landscape:* South-facing back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—volcanic rock

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, Wyoming big sagebrush

*Percent of surface covered by rock fragments:* 20 percent pebbles, 20 percent cobbles, 5 percent stones

**Typical Profile**

0 to 4 inches—very stony loam; 30 to 50 percent cobbles and stones, 40 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GM; estimated AASHTO classification—A-2, A-4

4 to 15 inches—very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam; 25 to 45 percent cobbles and stones, 35 to 55 percent pebbles (by weight); subangular blocky structure; slightly hard, friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

**Soil and Water Features**

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 9 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

**Characteristics of the Itca Soil**

*Position on landscape:* Shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum; source—volcanic rock  
*Slope features:* Length—long; shape—convex to concave

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, antelope bitterbrush

*Percent of surface covered by rock fragments:* 10 percent stones

### Typical Profile

0 to 2 inches—very stony loam; 30 to 50 percent cobbles and stones, 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6

2 to 14 inches—very cobbly clay loam, very gravelly clay, extremely gravelly clay; 0 to 55 percent cobbles and stones, 25 to 70 percent pebbles (by weight); prismatic structure parting to angular blocky structure; hard, friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-7, A-2

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—moderate; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Scattered small peaks and ridges

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

#### Inclusion 2

*Position on landscape:* Eroded back slopes and

shoulder slopes of mountains over very altered volcanic rock

*Contrasting features:* Soft bedrock within a depth of 10 inches, lower water-supplying capacity

*Distinctive present vegetation:* Utah juniper, singleleaf pinyon, Wyoming big sagebrush, black sagebrush

#### Inclusion 3

*Position on landscape:* South-facing back slopes of mountains at lower elevations

*Contrasting features:* Lower water-supplying capacity, no thick dark surface layer

*Distinctive present vegetation:* Wyoming big sagebrush, spiny hopsage

### Major Uses

**Current uses:** Rangeland, wildlife habitat, grazable woodland

#### Woodland

*Site index for common trees on the Ravenswood soil:*

Singleleaf pinyon—50; Utah juniper—50

*Site index for common trees on the Brier soil:* Singleleaf pinyon—30; Utah juniper—30

*Site index for common trees on the Itca soil:* Singleleaf pinyon—45; Utah juniper—45

*Most important native understory plants:* Ravenswood and Itca soils—mountain big sagebrush, antelope bitterbrush; Brier soil—Wyoming big sagebrush, antelope bitterbrush

#### Ratings of the Ravenswood Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; coniferous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—erodes easily

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Moderate—thin layer

#### Ratings of the Brier Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—poor; coniferous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### **Ratings of the Itca Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants

(nonirrigated)—fair; coniferous plants

(nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, slope, large stones

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, thin layer

#### **Interpretive Groups**

*Capability classification:* Ravenswood soil—VIIs, nonirrigated; Brier soil—VIIs, nonirrigated; Itca soil—VIIs, nonirrigated

*Woodland suitability group:* Ravenswood soil—1R; Brier soil—1R; Itca soil—1R

### **8040—Jetcop-Gabbvally association**

#### **Map Unit Setting**

*Position on landscape:* Plateaus

*Elevation:* 6,400 to 7,600 feet

*Average annual precipitation:* About 10 inches

*Average annual air temperature:* About 52 degrees F

*Frost-free season:* About 115 days

#### **Composition**

*Major components:*

- Jetcop very stony loamy sand, 4 to 30 percent slopes (Xerollic Durargids, clayey, mixed, mesic, shallow)—70 percent

- Gabbvally very stony loam, 30 to 75 percent slopes (Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic)—15 percent

*Contrasting inclusions:*

- Inclusion 1: Itca very stony loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid)—6 percent

- Inclusion 2: Garhill very stony sandy loam, 4 to 30 percent slopes (Typic Durorthids, loamy, mixed, mesic, shallow)—5 percent

- Inclusion 3: Rock outcrop—4 percent

#### **Characteristics of the Jetcop Soil**

*Position on landscape:* Summits of plateaus

*Parent material:* Kind—residuum and colluvium; source—basalt with additions of eolian material high in volcanic ash

*Slope features:* Length—long; shape—slightly concave to slightly convex

*Dominant present vegetation:* Wyoming big sagebrush, Nevada ephedra, galleta, spiny menodora

*Percent of surface covered by rock fragments:* 30 percent pebbles, 10 percent cobbles, 3 percent stones

#### **Typical Profile**

0 to 6 inches—very stony loamy sand; 15 to 30 percent cobbles and stones, 25 to 50 percent pebbles (by weight); platy structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-1, A-2

6 to 16 inches—gravelly clay loam, gravelly clay; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); angular blocky structure; hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC, GC; estimated AASHTO classification—A-6, A-7

16 to 60 inches—indurated duripan

#### **Soil and Water Features**

*Depth to hardpan:* 14 to 20 inches

*Depth to bedrock:* More than 60 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 7 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—5

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Low

#### **Characteristics of the Gabbvally Soil**

*Position on landscape:* Side slopes of plateaus

*Parent material:* Kind—residuum and colluvium; source—basalt

*Slope features:* Length—long; shape—slightly concave

*Dominant present vegetation:* Wyoming big sagebrush, desert needlegrass, Nevada ephedra, spiny hopsage

*Percent of surface covered by rock fragments:* 5 percent stones

### Typical Profile

0 to 2 inches—very stony loam; 10 to 40 percent cobbles and stones, 30 to 45 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 7.2); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM; estimated AASHTO classification—A-4

2 to 8 inches—very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam; 0 to 15 percent cobbles and stones, 50 to 65 percent pebbles (by weight); subangular blocky structure; soft, very friable; mildly alkaline (pH 7.4); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-2

8 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 6 to 14 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderate

*Available water capacity:* About 1 inch

*Water-supplying capacity:* About 7 inches

*Runoff:* Very rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.15; T value—1; wind erodibility group—7

*Hazard of erosion:* By water—severe; by wind—slight

*Shrink-swell potential:* Low

*Corrosivity:* Steel—moderate; concrete—low

*Potential for frost action:* Moderate

### Contrasting Inclusions

#### Inclusion 1

*Position on landscape:* Shoulder slopes of plateaus at higher elevations

*Contrasting features:* No cemented pan, higher water-supplying capacity

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush

#### Inclusion 2

*Position on landscape:* Shoulder slopes and summits of plateaus at lower elevations

*Contrasting features:* No horizon of clay accumulation, lower water-supplying capacity

*Distinctive present vegetation:* Spiny menodora, shadscale, galleta

### Inclusion 3

*Position on landscape:* Scattered small areas of rimrock on shoulder slopes of plateaus

*Contrasting features:* Bedrock exposed at the surface

*Distinctive present vegetation:* None

### Major Uses

**Current uses:** Rangeland, wildlife habitat

### Ratings of the Jetcop Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—cemented pan, slope

*Local roads and streets:* Severe—cemented pan, slope

*Roadfill:* Poor—cemented pan

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Ratings of the Gabbvally Soil for Various Uses

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—poor; shrubs (nonirrigated)—poor

*Range seeding:* Poor—droughty, large stones, depth to bedrock

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### Interpretive Groups

*Capability classification:* Jetcop soil—VIIe, nonirrigated; Gabbvally soil—VIIs, nonirrigated

*Range site:* Jetcop soil—029X010N; Gabbvally soil—029X010N

## 8050—Itca-Teguro-Rock outcrop association

### Map Unit Setting

*Position on landscape:* Mountains

*Elevation:* 7,000 to 7,800 feet

*Average annual precipitation:* About 13 inches

*Average annual air temperature:* About 46 degrees F

*Frost-free season:* About 90 days

### Composition

#### Major components:

- Itca very stony loam, 15 to 50 percent slopes (Lithic Argixerolls, clayey-skeletal, montmorillonitic, frigid)—45 percent
- Teguro very stony loam, 15 to 50 percent slopes (Lithic Argixerolls, loamy, mixed, frigid)—30 percent
- Rock outcrop—10 percent

#### Contrasting inclusions:

- Inclusion 1: Typic Xerorthents, gravelly clay loam, 15 to 50 percent slopes (Typic Xerorthents, clayey, montmorillonitic, frigid)—5 percent
- Inclusion 2: Typic Durixerolls, cobbly sandy loam, 4 to 15 percent slopes (Typic Durixerolls, clayey-skeletal, montmorillonitic, frigid)—5 percent
- Inclusion 3: Squawtip extremely stony sandy loam, 30 to 75 percent slopes (Typic Argixerolls, loamy-skeletal, mixed, frigid)—3 percent
- Inclusion 4: Borealis very stony fine sandy loam, 4 to 15 percent slopes (Abruptic Durixerolls, fine, montmorillonitic, frigid)—2 percent

### Characteristics of the Itca Soil

*Position on landscape:* Shoulder slopes and back slopes of mountains

*Parent material:* Kind—residuum and colluvium; source—basalt

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, antelope bitterbrush

*Percent of surface covered by rock fragments:* 10 percent stones

#### Typical Profile

0 to 2 inches—very stony loam; 30 to 50 percent cobbles and stones, 35 to 50 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—GM-GC, GC; estimated AASHTO classification—A-4, A-6

2 to 14 inches—very cobbly clay loam, very gravelly clay, extremely gravelly clay; 0 to 55 percent cobbles and stones, 25 to 70 percent pebbles (by weight); prismatic structure parting to angular blocky; hard, friable; nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—CL, GC; estimated AASHTO classification—A-7, A-2

14 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 10 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 10 inches

*Runoff:* Rapid

*Hydrologic group:* D

*Erosion factors (surface layer):* K value—.10; T value—1; wind erodibility group—8

*Hazard of erosion:* By water—slight; by wind—slight

*Shrink-swell potential:* Moderate

*Corrosivity:* Steel—high; concrete—low

*Potential for frost action:* Moderate

### Characteristics of the Teguro Soil

*Position on landscape:* Side slopes of mountains

*Parent material:* Kind—colluvium and residuum; source—andesite

*Slope features:* Length—long; shape—slightly convex

*Dominant present vegetation:* Singleleaf pinyon, Utah juniper, mountain big sagebrush, antelope bitterbrush

*Percent of surface covered by rock fragments:* 30 percent pebbles, 10 percent cobbles, 5 percent stones

#### Typical Profile

0 to 4 inches—very stony loam; 10 to 25 percent cobbles and stones, 25 to 40 percent pebbles (by weight); subangular blocky structure; soft, very friable; neutral (pH 6.8); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SM; estimated AASHTO classification—A-4

4 to 15 inches—gravelly clay loam, gravelly loam; 0 to 10 percent cobbles and stones, 25 to 50 percent pebbles (by weight); subangular blocky structure; slightly hard, very friable; neutral (pH 7.0); nonsaline (less than 2 mmhos/cm); nonsodic (SAR less than 2); estimated Unified classification—SC; estimated AASHTO classification—A-2, A-6

15 inches—unweathered bedrock

### Soil and Water Features

*Depth to bedrock:* 14 to 20 inches

*Depth to seasonal high water table:* More than 60 inches

*Frequency of flooding:* None

*Permeability:* Moderately slow

*Available water capacity:* About 2 inches

*Water-supplying capacity:* About 10 inches  
*Runoff:* Rapid  
*Hydrologic group:* D  
*Erosion factors (surface layer):* K value—.20; T value—1; wind erodibility group—7  
*Hazard of erosion:* By water—moderate; by wind—slight  
*Shrink-swell potential:* Moderate  
*Corrosivity:* Steel—moderate; concrete—low  
*Potential for frost action:* Moderate

### **Characteristics of the Rock Outcrop**

*Position on landscape:* Scattered small peaks and ridges

*Dominant present vegetation:* None

### **Contrasting Inclusions**

#### **Inclusion 1**

*Position on landscape:* Side slopes of mountains underlain by highly altered volcanic rock

*Contrasting features:* Lower water-supplying capacity, weathered bedrock at a depth of 10 to 20 inches

#### **Inclusion 2**

*Position on landscape:* Crests and shoulder slopes of mountains underlain by basalt

*Contrasting features:* Cemented pan at a depth of 20 to 40 inches

*Distinctive present vegetation:* Singleleaf pinyon, Utah juniper, low sagebrush

#### **Inclusion 3**

*Position on landscape:* North-facing back slopes of mountains

*Contrasting features:* Bedrock at a depth of more than 20 inches

#### **Inclusion 4**

*Position on landscape:* Summits of plateau remnants

*Contrasting features:* Cemented pan at a depth of 20 to 35 inches, less than 35 percent pebbles throughout the profile

### **Major Uses**

**Current uses:** Rangeland, wildlife habitat

### **Woodland**

*Site index for common trees on the Itca soil:* Singleleaf pinyon—45; Utah juniper—45

*Site index for common trees on the Teguro soil:* Singleleaf pinyon—55; Utah juniper—55

*Most important native understory plants:* Itca and Teguro soils—antelope bitterbrush, mountain big sagebrush, green ephedra, pine bluegrass, needlegrass, bottlebrush squirreltail, Indian ricegrass

### **Ratings of the Itca Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, large stones, slope

*Local roads and streets:* Severe—depth to bedrock, slope, large stones

*Roadfill:* Poor—depth to bedrock, slope, large stones

*Sand:* Improbable source—excess fines, large stones

*Gravel:* Improbable source—excess fines, large stones

*Embankments, dikes, and levees:* Severe—large stones, thin layer

### **Ratings of the Teguro Soil for Various Uses**

*Wildlife habitat elements:* Wild herbaceous plants (nonirrigated)—fair; coniferous plants (nonirrigated)—fair; shrubs (nonirrigated)—fair

*Range seeding:* Poor—droughty, large stones

*Shallow excavations:* Severe—depth to bedrock, slope

*Local roads and streets:* Severe—depth to bedrock, slope

*Roadfill:* Poor—depth to bedrock, slope

*Sand:* Improbable source—excess fines

*Gravel:* Improbable source—excess fines

*Embankments, dikes, and levees:* Severe—thin layer

### **Interpretive Groups**

*Capability classification:* Itca soil—VIIs, nonirrigated; Teguro soil—VIIs, nonirrigated

*Woodland suitability group:* Itca—1R; Teguro—2R

# Prime Farmland

---

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 4 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

A recent trend in land use has been the conversion

of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

About 4,500 acres in the survey area, or 0.2 percent of the total acreage, meets the requirements for prime farmland in areas where an adequate and dependable supply of irrigation water is available. On some soils measures have been used to overcome a hazard or limitation, such as flooding or salinity.

The map units in the survey area that are considered prime farmland are listed at the end of this section. This list does not constitute a recommendation for a particular land use. The location of each map unit is shown on the detailed soil maps at the back of this publication. Soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

The map units or parts of map units that in irrigable areas meet the requirements for prime farmland are:

1445	Reclaimed Slaw soil in Slaw, reclaimed-Slaw-Fallon complex, 0 to 2 percent slopes
1981	Geer part of the Tert-Whilphang-Geer association
2022	Geer part of the Armespan-Whilphang-Geer association
2091	Geer part of the Geer-Veet association
2092	Geer fine sandy loam, 0 to 4 percent slopes
2110	Bylo Variant very fine sandy loam, 0 to 2 percent slopes
4030	Geer part of the Koyen-Geer association
4081	Fadoll part of the Truvar-Fadoll association
5011	Holtle Variant part of the Mopana-Holtle Variant association



# Use and Management of the Soils

---

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel and roadfill. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

## Crops and Pasture

John Schelling, district conservationist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture

is suggested in this section. The system of land capability classification used by the Soil Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for selected soils.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Resource management systems are a combination of interrelated conservation practices and management techniques used to arrest or prevent deterioration of cropland or pasture and maintain the productive capability of the soil. These systems keep erosion and other factors that may restrict production within acceptable limits.

Different management is needed on diverse kinds of soil. Basic essential practices, however, apply to all cultivated soils. Aspects of management are described in the following paragraphs.

**Cropping system.** A desirable cropping system consists of a crop rotation and cultural and management practices that protect the soil from erosion and maintain or improve fertility and tilth. It should include perennial legumes, grass-legume mixtures, or other crops that produce large quantities of residue to compensate for crops in the rotation that produce little or no residue.

Applying the proper kinds and amounts of fertilizer maintains or improves fertility. Limiting tillage operations to those that are essential for seedbed preparation and weed control and timing them to coincide with the proper soil moisture condition help to prevent compaction and maintain tilth.

A typical cropping system used in this survey area is 8 or more years of alfalfa and 1 or 2 years of small grain. Residue from small grain is usually returned to the soil. Alfalfa can be seeded into the grain stubble.

**Irrigation water management.** Proper irrigation water management is the application of irrigation water at

rates and in amounts adequate to produce high crop yields and to minimize soil and water losses. Water is applied according to the crop needs and the characteristics of the soil.

A good irrigation distribution system is one that has enough capacity to meet the needs of the crops grown during periods of peak use. Properly locating and controlling the system can ensure that seepage losses are minimal. The design of an irrigation system is governed by the method of irrigation to be used, the amount of land leveling needed, and the expected efficiency in applying water.

Efficient application of water involves consideration of the available water capacity, the water intake rate, and the crop needs. Most crops should be irrigated when 40 to 50 percent of the available moisture in the top half of the root zone has been used. A soil check can be made 2 days after irrigation to determine whether the desired amount of moisture was added.

**Management of saline-alkali soils.** Like most soils in arid and semiarid regions, the soils in this survey area contain at least small quantities of soluble salts and sodium. In some soils high concentrations of salts and sodium limit or prevent the growth of crops. Because precipitation is low and the rate of evaporation is high, salts accumulate in the root zone. In addition, many low-lying areas receive salty water from runoff or seepage. Surface evaporation of this water generally results in an increase in content of soluble salts on or in the soils. In some areas that have a high water table, water rises in the soil by capillary action and carries dissolved salts with it. The soluble salts can be moved to any part of the soil profile.

A soil that contains excessive amounts of soluble salts is called a saline soil. One that contains excessive amounts of exchangeable sodium is called a sodic, or alkali, soil. A soil that contains excessive amounts of both soluble salts and sodium is referred to as a saline-alkali soil.

Four classes of salinity are recognized in the detailed map unit descriptions. These classes are as follows:

*Nonsaline soils* are those that contain less than 0.15 percent soluble salts. The electrical conductivity of the saturation extract is less than 4 millimhos per centimeter at 25 degrees C.

*Slightly saline soils* are those that contain 0.15 to 0.35 percent soluble salts. The electrical conductivity of the saturation extract is 4 to 8 millimhos per centimeter at 25 degrees C.

*Moderately saline soils* are those that contain 0.35 to 0.65 percent soluble salts. The electrical conductivity of

the saturation extract is 8 to 16 millimhos per centimeter at 25 degrees C.

*Strongly saline soils* are those that contain more than 0.65 percent soluble salts. The electrical conductivity of the saturation extract is more than 16 millimhos per centimeter at 25 degrees C.

Four classes of sodicity are used in the detailed soil map unit descriptions. These classes are as follows:

*Nonsodic soils* contain less than 15 percent exchangeable sodium.

*Slightly sodic soils* contain 15 to 30 percent exchangeable sodium.

*Moderately sodic soils* contain 30 to 40 percent exchangeable sodium.

*Strongly sodic soils* contain more than 40 percent exchangeable sodium.

Soils differ in the kinds of salts they contain and in the practices needed for improvement; however, some general guidelines can be given. For example, an adequate supply of good-quality water and an adequate drainage system are needed to reclaim any salt- or sodium-affected soil. Two methods of applying water are commonly used. One method is land leveling that results in flat basins in which the water can accumulate. The other method involves leveling the land to a uniform grade and then flooding between border dikes. If drainage is adequate and if large amounts of water are used, the soluble salts can be leached out of the root zone by either method. The process is more difficult if a soil contains an excessive amount of exchangeable sodium. In addition to drainage and leaching, other practices are needed to improve sodium-affected soils.

Chemical amendments used to replace sodium are gypsum and its various forms, including gypsite, anhydrite, and selenite, as well as elemental sulfur, sulfuric acid, iron sulfate, and aluminum sulfate. The amount and type of amendment needed can be determined by laboratory analysis of soil samples, which indicates the amounts of sodium that must be replaced if the soil is to be improved.

An alternative to reclamation through the use of large quantities of gypsum is the seeding of salt- and sodium-tolerant grasses. Among these are tall wheatgrass, western wheatgrass, and alta fescue. These grasses can grow in relatively strong concentrations of both soluble salts and sodium.

**Proper pasture management.** Proper pasture management includes adjusting stocking rates or the season of use so that the maximum growth and survival of high-quality grasses and legumes can be achieved. A

common method is to rotate grazing among several pastures. This method allows adequate regrowth in each pasture. Livestock should be excluded when the pastures are wet. Allowing livestock to graze on wet pasture results in compaction of the soil, a decrease in the water intake rate, and deterioration of soil structure. Proper irrigation management and proper drainage help to keep the pastures in good condition. Increased yields can be obtained by applying commercial fertilizer and barnyard manure. Weeds generally can be controlled by mowing. The droppings of manure should be spread with a drag each spring.

*Application of plant nutrients.* Most crops in the survey area respond well to applications of solid or liquid fertilizer. Specific fertilizer requirements are based upon soil samples or plant tissue analyses. Applications of phosphorus and nitrogen increase the production of small grain and aid in establishing alfalfa. Unless seeded in combination with grass, established alfalfa generally requires only applications of phosphorus throughout the duration of the stand.

*Erosion control.* Protection of the surface layer from water erosion and soil blowing is important because this layer contains most of the organic matter and is generally more fertile than the rest of the soil. Soil blowing can be controlled by leaving a protective plant cover on the surface and by using minimum tillage during windy periods. Water erosion generally is controlled by leveling and by applying irrigation water at the proper rate.

**Hayland management.** Proper hayland management prolongs the life of desirable forage plants, maintains or improves the quality of forage, protects the soil from erosion, and limits water losses. Alfalfa hay is grown on most of the hayland in the survey area. High-quality, certified, inoculated seeds of locally adapted species produce the highest yields during the growing season. The amount of irrigation water and frequency of application depend on the available water capacity of the soil and the rate of evapotranspiration.

Land leveling, grading, shaping, and subsoiling should be completed before final seedbed preparation. An annual crop should be grown for at least 1 year before alfalfa is established. Generally, yields are increased by applications of fertilizer. For the highest quality forage, alfalfa should be harvested at about  $\frac{1}{10}$  bloom or when new crown buds are 1.0 inch to 1.5 inches long.

Aftermath grazing can be used in fall or winter. Stubble should be left at a height of 3 to 4 inches to protect the soil from erosion. Plants should not be grazed late in winter or early in spring, when they have

started new growth. Grazing at this time depletes nutrient reserves in the roots. This depletion can damage the stand and reduce forage production.

*Drainage.* Soils that are flooded naturally or by seasonal irrigation require a surface drainage system. Field ditch mains or laterals are needed to dispose of excess surface or subsurface water, to intercept ground water, to control ground-water levels, and to aid in the leaching of salts and sodium from the soils.

## Rangeland

Gary K. Brackley and Daniel A. Kaffer, range conservationists, Soil Conservation Service, helped prepare this section.

About 85 percent of the land in the survey area is rangeland. Livestock grazing is the principal agricultural use of this rangeland. Ranches are mostly cow-calf or cow-calf-sheep operations. Ranches vary in size from a few hundred acres to several thousand acres and rely heavily on permitted use of public lands. Most of the rangeland within the survey area is administered by either the Bureau of Land Management, the Forest Service, or the Bureau of Indian Affairs.

During the mining booms of the 1870's, herds of cattle, sheep, oxen, horses, burros, and, occasionally, camels were brought to the Mineral County area to power and feed the developing mining communities. Heavy grazing during these periods depleted the native stands of forage throughout much of the area. The devastation of plant communities through uncontrolled livestock grazing has long ended, but severely depleted areas still reflect the impact of historical abusive grazing practices. Palatable shrubs and herbaceous vegetation have largely been replaced by less desirable shrubs, and perennial grasses and forbs have been eliminated from many of these areas. Recovery of the plant community has been most evident where previous abuses were limited. The slow recovery rate of degraded plant communities in the survey area can be attributed in large part to the harshness of climate. Much of the area receives less than 8 inches mean annual precipitation. Intense summer rainstorms result in high rates of geologic erosion and a severe hazard of accelerated erosion if the natural plant cover is distributed.

For most plant communities, good management can improve the present range condition and productivity while preventing accelerated erosion. Proper management of rangeland is dependent upon many factors. The season of grazing use, the kind of grazing animal, the intensity and distribution of grazing, and a knowledge of the range resource potential, condition,

and trends are important management considerations. In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on a knowledge of the relationships between soils, vegetation, and moisture available for plant growth.

The tables in the section "Rangeland Plants and Woodland Understory" show the rangeland plants and woodland understory for each major soil and contrasting inclusion in the detailed soil map units; the range site number; the total annual production of vegetation in favorable, normal, and unfavorable years; the common plant name and plant symbol for the characteristic vegetation; and the average percent composition for each species in the potential plant community. A more detailed ecological description of each range site, identified by number, is provided in a technical guide available in the local office of the Soil Conservation Service.

A *range site* is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was established during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt or lime content, and topographic position also are important.

*Potential production* is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, flowers, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre reduced to a common percent of air-dry moisture.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name.

The expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals, the grazing season, and the availability of forage. Many plants, trees, and shrubs are inaccessible to foraging animals.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community for a given use.

Generally, the objective in range management is to manage grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, conservation of water, and control of erosion. To meet a special need or a specific use, however, it may be desirable to manage for a plant community other than the potential plant community for the site. In such cases, care must always be taken not to increase the hazard of erosion. Future uses and the relative ability of given sites to respond to management should be considered if the management objective is to establish a plant community other than the potential plant community.

The survey area is on the western fringe of the Basin and Range physiographic province. Major plant associations within the survey area typify the vegetation common to the Great Basin region. The lower landscapes are dominated by salt-desert shrub plant communities. These communities are normally a reflection either of a climatically dry environment, where the mean annual precipitation is less than 8 inches, or of physiologically dry soil conditions. These conditions are caused by loss of soil moisture through surface runoff, a very low ability of the soil to hold water, or high concentrations of salts that interfere with the uptake of soil moisture.

In landscape positions above the salt-desert shrub zone, sagebrush-grass plant communities are dominant where the mean annual precipitation is 8 inches or more. At the mid and upper elevations within the sagebrush-grass zone, pinyon juniper plant communities commonly dominate the site. The highest elevations in the survey area are typically dominated by

sagebrush-grass communities adapted to a cold, moist environment.

General soil map units 3, 4, 5, 6, and 9 reflect plant communities of the salt-desert shrub zone in the survey area. Representative shrubs of these communities are shadscale, Bailey greasewood, bud sagebrush, winterfat, wolfberry, fourwing saltbush, and rabbitbrush. Common grasses include Indian ricegrass, bottlebrush squirreltail, Sandberg bluegrass, galleta, and desert needlegrass.

Salt-desert shrub plant communities in the survey area range from stands dominated by a single shrub species to relatively heterogeneous mixtures of shrubs and grasses. The vegetation of these communities is usually sparse. It normally covers less than 10 percent of the surface.

The naturally sparse plant cover of most salt-desert shrub communities results in a susceptibility to wind and water erosion. The stability of the soil in the spaces between plants in salt-desert shrub communities is provided by a surface pavement of rock fragments or by a microphytic (algae) crust at the surface where there are no rock fragments. Either of these soil protective features can be damaged by livestock trailing or off-road vehicle traffic.

Salt-desert shrub plant communities are most valuable as winter range for livestock. These sites can produce high-quality winter forage and are usually subject to only light snowfall. Most of the desirable forage species within salt-desert shrub sites, including winterfat and, especially, bud sagebrush, are adversely affected by grazing in March and April and by heavy use.

Properly regulated grazing management practices, such as periodic rest during critical periods of growth, rotation grazing, and control of the intensity and season of use, can enhance the long-term productivity of salt-desert shrub plant communities. Fences, herding, and control of livestock access to watering facilities can help to achieve a better distribution of grazing. Because of the inherent environmental harshness of the salt-desert shrub zone, caution is needed when revegetation projects are planned.

Within the salt-desert shrub zone are low-lying areas that receive extra moisture. Plant communities that occur in these areas are represented by those in general soil map unit 1. Many of these sites receive extra moisture as run-on from slightly higher landscape positions and are subject to shallow, low-velocity overflow during periods of runoff. Torrey quailbush, black greasewood, and basin wildrye are important

plants on these sites. Other plant communities that reflect extra moisture conditions are in areas adjacent to valley-floor playas. These sites have a high water table during periods of runoff. Black greasewood, inland saltgrass, and alkali sacaton are typical of the plants on these sites. The extra-moisture sites in general soil map unit 1 are limited in extent and typically are more productive than the surrounding upland plant communities and generally provide green and succulent forage longer into the summer period.

Plant communities that occur on the flood plain along the Walker River are represented by those in general soil map unit 2. The soils in these areas are potentially the most productive soils in the survey area. The higher parts of the flood plain and flood-plain areas that have been downcut by the Walker River or by gullying typically support a potential plant community dominated by basin wildrye. The lower lying areas of the flood plain support plant communities dominated by alkali sacaton and inland saltgrass on saline- and alkali-affected soils. Creeping wildrye, basin wildrye, and moisture-loving (hydrophytic) plants, including Fremont cottonwood, are characteristic of the potential vegetation in nonsaline, low-lying areas of the flood plain. Water spreading can increase forage production and help to maintain the salt balance of the soils in these areas. Careful management of grazing is required because of the susceptibility of these sites to gully erosion, which can drastically reduce forage production.

Sagebrush-grass plant communities at the lower elevations within the survey area are represented by those in general soil map units 7, 9, and 10. Native sagebrush-grass communities have a shrub canopy dominated by a species or subspecies of sagebrush. Wyoming big sagebrush, black sagebrush, and, to a lesser extent, low sagebrush are dominant at the lower elevations. Small areas of basin big sagebrush occur in landscape positions that receive extra moisture. Cool-season perennial grasses are potentially the dominant vegetation of many sagebrush-grass plant communities in the survey area. These include Indian ricegrass, needleandthread, desert needlegrass, bottlebrush squirreltail, and Sandberg bluegrass. Galleta, a warm-season perennial grass, commonly grows on sagebrush range sites at the lower elevations. Desirable forage plants of many of the sagebrush-grass plant communities within the survey area have been greatly depleted or even eliminated by excessive and untimely grazing. Uneven livestock distribution has resulted in both overuse and underuse of the native forage in some areas. The extent of cool-season grasses has

decreased, and the extent of woody, nonforage plants has increased. The productivity of forage plants generally is below the production potential on many sites.

The increase in the number and size of sagebrush and other shrubs and the invasion by juniper and pinyon in local areas of sagebrush-grass range sites have reduced the amount of soil moisture and nutrients available to perennial grasses and forbs. In areas where range condition has not excessively deteriorated and where an adequate population of desirable perennial grasses and forbs is available, brush management can be effective in reversing the trend toward an increasing dominance of woody vegetation. Range seeding may be required following the removal of woody vegetation in areas where desirable understory plants are not included in the present plant community. Revegetation may also be necessary for critical-area treatment following wildfire or other major disturbance. Seeding adapted forage species that are tolerant of early spring grazing is an important aspect in the management of grazing on adjacent native sagebrush-grass and salt-desert shrub plant communities. Maximum grazing capacity is achieved in seeded stands where management is directed toward uniform grazing of the stand and prevention of the concentration of livestock. Additional water developments or water hauling, fencing, or herding may be required to meet management objectives. Caution is needed when revegetation projects in these sagebrush-grass communities at the lower elevations are planned. These sites are at the bottom end of the precipitation zone in which seeding success can be expected. The frequency of years with below-normal precipitation is relatively high. The risk of seeding failure because of the unpredictability of the climate should be acknowledged in addition to critical soil properties that can affect seeding success.

Each soil in the survey area is rated in the detailed soil map units as to suitability for planned range seeding. Criteria used to develop these ratings are listed in the Appendix. Where critical-area treatment is necessary, it may be advantageous to provide a plant cover that helps to prevent accelerated erosion on soils that are poorly suited to range seeding.

Local expansion of pinyon and, especially, juniper trees away from potential woodland sites onto adjacent rangeland occurs within the survey area. Juniper and pinyon invasion into sagebrush-grass communities has been attributed to overgrazing, a lack of naturally recurring fire, and climatic fluctuations. Young juniper and pinyon trees are easily killed by fire. Depletion of

the plants that most readily carry fire, which are called "fine fuels," and, to a lesser extent, fire suppression efforts, however, have limited the frequency and extent of natural fire within the sagebrush-grass zone.

Therefore, juniper and pinyon seedlings have become established in increasing numbers on sites that were once relatively free of trees as a result of natural fires.

The highest elevations of the survey area, represented by general soil map unit 15, typically support high-elevation sagebrush-grass plant communities. Communities in which mountain big sagebrush and low sagebrush are the dominant plants are the most common. Antelope bitterbrush is commonly associated with these sites. Shrub understory grasses include Thurber needlegrass, pine needlegrass, western needlegrass, Columbia needlegrass, prairie junegrass, bluegrasses, and basin wildrye. These sites are potentially very productive and normally respond rapidly to management. Most remain cold and wet throughout the spring and into the early summer months. Grazing should be delayed on these sites until the surface soil has dried sufficiently for the prevention of soil compaction and until the forage plants can withstand grazing pressure. Snow often blankets these sites by late fall, further restricting the period of use.

Seeps and springs are common at these high elevations, and livestock water is often readily available. To achieve better livestock distribution, however, additional water developments may be necessary. Spring developments, pipelines, and storage tanks provide dependable means of supplying water. Fences are used to divide large pastures into smaller, more manageable units. Fences, watering facilities, and herding can force livestock to use areas that might otherwise be left ungrazed. Salt and mineral blocks should be placed away from water.

Steeply sloping terrain is common throughout the high-elevation sagebrush-grass zone. Livestock tend to overgraze the less sloping areas if grazing is not evenly distributed. Brush management can be very effective in increasing native forage production on sites where the number of perennial grasses and forbs allows for a good response to release from competition with the sagebrush.

The relatively high availability of soil moisture on these high-elevation sagebrush-grass communities allows a varied selection of adapted plants for revegetation. Because of the slope and the surface rock fragments prevalent in these areas, onsite evaluation is needed when revegetation is considered.

## Woodland Management

Gary Brackley and Daniel A. Kaffer, range conservationists, Soil Conservation Service, helped prepare this section.

Approximately 400,000 acres of singleleaf pinyon and Utah juniper woodland is in the survey area. The major pinyon-juniper stands are in the ranges of the Wassuk, Excelsior, Gabbs Valley, Pilot, Cedar, and White Mountains and in the Bodie Hills and Aurora areas. The Bureau of Land Management and the Forest Service administer the majority of these woodlands. Smaller pinyon-juniper stands are privately owned or are administered by the Bureau of Indian Affairs.

During the mining booms of the late 1800's, much of the woodland resource in the survey area was harvested for use in ore processing or as mine props or was burned as domestic firewood. Large portions of the pinyon-juniper woodland in the survey area support trees less than 125 years old. These trees are the result of regrowth after the early mining boom period. Old ax-cut stumps are common in the regrowth stands of pinyon and juniper.

Pinyon and juniper woodlands are generally low in productivity at elevations where juniper is the dominant species. At the higher elevations, pinyon is dominant in the overstory and the woodland is more productive.

In the pristine environment, stands of pinyon and juniper woodland were restricted to specific soils and landscape positions by naturally occurring wildfires. Young pinyon and juniper trees are very susceptible to ground fires until their crowns grow well above the sagebrush-grass vegetation. Fire generally eliminates or greatly reduces the number of tree seedlings on soils that produce continuous stands of fine fuels. Production of fine fuels is restricted on soils that are droughty, shallow, or stony. In a sparse stand of fine fuels, the frequency and extent of wildfires are reduced and suitable sites for stands of pinyon and juniper are available.

Settlement in the survey area has reduced the frequency and size of natural fires through fire prevention, and livestock grazing has disrupted the cover of fine fuels. With changes in the extent and frequency of natural fire, significant changes in the character of pinyon-juniper woodlands and associated rangeland have occurred. The original woodlands have become more dense, and adjacent sagebrush-grass communities have been invaded by these conifers.

Traditional products of the pinyon-juniper woodlands include firewood, fence posts, pine nuts, and Christmas trees. As energy demands and costs increase, firewood harvesting becomes more important. Other woodland

uses are livestock grazing, wildlife food and cover, recreation, and watershed.

Managing pinyon and juniper woodland for a sustained yield is a relatively new concept. Pinyon or juniper wood is not suitable for lumber, and the woodlands generally have not been managed for commercial tree production. Conversion of pinyon-juniper woodlands to rangeland has been the trend in the past, and several satisfactory conversion methods have been developed. Because of the growing demand for firewood, however, management of these woodlands should include evaluations of the economic value of firewood production as well as livestock grazing.

Thinning and improvement cuttings are recommended for sustained yields. Harvesting selected trees for fenceposts and firewood can provide an economic return and improve the quality and yield of the stands. Thinning and selective tree harvesting maintain an open overstory canopy that can optimize understory forage production while allowing more vigorous growth of the remaining trees.

Tree production should be encouraged on sites known to be productive or on soils that originally supported pinyon-juniper woodland. Controlling the invasion of pinyon or juniper into sagebrush-grass rangeland helps to prevent the loss of forage and the potential degradation of the rangeland resource. When a woodland management plan is developed, it is important to evaluate the soil and site potentials. Consideration should be given to all woodland values, site opportunities, and economic factors.

The detailed soil map unit descriptions can be used by woodland managers in planning the use of soils for wood crops. The woodland suitability group is indicated for each soil used as woodland. The group is indicated by an ordination symbol. Soils assigned to the same group require the same general management and have about the same potential productivity.

The first part of the ordination symbol, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, a high content of rock fragments in the soil. The

letter A indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

The potential productivity of merchantable or common trees on a soil is expressed as a site index. For pinyon and juniper woodland, this index is based on tree basal area per acre. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

### Woodland Understory Vegetation

Understory vegetation consists of grasses, forbs, shrubs, and other plants. If well managed, some woodland can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, the amount of litter accumulation, and the level of plant competition for soil moisture and nutrients.

The total production of understory vegetation, indicated in the section "Rangeland Plants and Woodland Understory," includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4.5 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

### Windbreaks and Environmental Plantings

John Schelling, district conservationist, Soil Conservation Service, helped prepare this section.

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection. All windbreaks in the survey area require irrigation.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen

houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Species adapted to specific soils should be selected for planting. Species suited to deep, well drained soils include Fremont cottonwood (male), Siberian elm, Scotch pine, cotoneaster, ponderosa pine, and Arizona cypress. Cottonwood, Russian olive, golden willow, buffaloberry, redosier dogwood, honeysuckle, and Athel are suited to wet soils. Species adapted to saline-sodic soils include Siberian elm, Athel, mulberry, Russian olive, buffaloberry, fourwing saltbush, and big saltbush. Rocky Mountain juniper, common chokecherry, cotoneaster, currant, Siberian peashrub, and pyracantha are suited to shallow soils.

### Wildlife Habitat

Soils influence the wildlife population primarily through the kinds and amount of vegetation and other habitat components they support. Wildlife productivity is directly related to soil fertility, moisture, and aeration.

Most wildlife habitats are created, improved, or maintained by planting suitable vegetation, maintaining the existing vegetation, inducing natural establishment of desired plants, or combinations of these measures. The behavior of soils can be predicted from knowledge of their properties. The growth and characteristics of plant communities that constitute wildlife habitat are affected by soil properties. Soils can be interpreted for their ability to produce a variety of plants and plant communities. From these interpretations and the knowledge of habitat requirements of wildlife species, the potential of a farm or ranch for specific kinds of wildlife under specific soil conditions can be evaluated.

The importance of riparian vegetation associated with the Walker River is related primarily to the diversity of the vegetation. Because riparian zones are basically long and narrow, the relatively small acreage of these zones is highly disproportionate to the total amount of available habitat. Some of the highest bird densities in the region are in the riparian zones.

These areas support a variety of birds and raptors, cottontail rabbit, jackrabbit, and muskrat. They are adjacent to some agricultural land in the lower valleys and to grasslands in the uplands.

The soils in the areas of rangeland vary considerably because of precipitation, slope, depth, and texture. A variety of wildlife inhabits the range sites. Species may include mule deer, cottontail rabbit, jackrabbit, chukar,

partridge, mourning dove, sage grouse, and songbirds. Also, some areas provide critical winter habitat for mule deer.

The wildlife habitat is generally managed in conjunction with competing uses. Management practices should be structured and applied so that the habitat elements required by individual species of wildlife can be enhanced or maintained. Planning for the joint production of several resources, such as range forage and wildlife or crops and wildlife, helps to meet the needs of land users.

Under the heading "Detailed Soil Map Units," the soils in the survey area are rated according to their potential for providing specific elements of wildlife habitat. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining the habitat elements; and in determining the intensity of management needed for each habitat element.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element. The element can be established, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element are very severe and that unsatisfactory results can be expected. Establishing, improving, or maintaining the element is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

*Grain and seed crops* are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

*Grasses and legumes* are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture

are also considerations. Examples of grasses and legumes are fescue, orchardgrass, bromegrass, clover, and alfalfa.

*Wild herbaceous plants* are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are needlegrass, balsamroot, globemallow, wheatgrass, and bluegrass.

*Coniferous plants* furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are singleleaf pinyon and juniper.

*Shrubs* are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

*Wetland plants* are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, reed canarygrass, saltgrass, cordgrass, rushes, sedges, and reeds.

*Shallow water areas* have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

## Recreation

Restrictive soil features, such as wetness, slope, texture of the surface layer, and susceptibility to flooding, should be considered in the selection of recreation sites. Other important considerations are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the

soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

Camp areas, picnic areas, playgrounds, and paths and trails require special attention.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Opportunities for diverse types of recreation are available in the survey area. Fishing, boating, hunting, overnight camping, rock hounding, exploring ghost towns, and casino gaming are some of the many recreational activities that are available.

Walker Lake, Weber Reservoir, and the Walker River provide fishing opportunities. Boating facilities also are available at Walker Lake and Weber Reservoir. Camping facilities are located at Walker Lake and in the Wassuk Mountains at Alum Creek, south of Hawthorne. Because of the tremendous variety of the local geology, rock hounding may be pursued in many locations

throughout the area. Ghost towns and old mining camps abound in many areas. Casino gaming is limited mainly to the Hawthorne area.

## Engineering

In the section "Detailed Soil Map Units," information for planning land uses related to urban development and to water management is provided. Soils are rated for various uses, and the most limiting features are identified. The ratings are given for the following selected uses: roadfill; shallow excavations; local roads and streets; embankments, dikes, and levees; sand; and gravel. The ratings are based on observed performance of the soils and on the estimated data given in the map unit descriptions. Information on other uses can be obtained from local offices of the Soil Conservation Service.

*The information is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.*

*The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.*

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings. The criteria used to determine the ratings are provided in the Appendix. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the

potential of areas for residential, commercial, industrial, and recreation uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the map unit descriptions, along with the soil maps, the taxonomic unit descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

### **Ratings for Various Uses**

In the detailed map unit descriptions, the soils are rated for various uses and the most limiting features are identified. The ratings are based on observed performance of the soils and on the estimated data given in the map units and lab test data. The limiting features are defined in the Glossary.

Soil interpretations are periodically updated as more is learned about a soil and its behavior under specific uses. New technology can change the relative suitability of a soil for various uses; however, the soil maps remain useful after the soil interpretations originally published with them have become outdated. For this reason, the criteria and guides that were used to make the interpretations presented in the detailed map units are provided in the Appendix. These criteria have been taken directly from the National Soils Handbook (19).

The limitations for shallow excavations, local roads and streets, and embankments, dikes, and levees are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are

required. Special feasibility studies may be required where the soil limitations are severe.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

*Local roads and streets* have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In the detailed map unit descriptions, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

In the detailed map units, the soils are rated as a source of roadfill, sand, and gravel.

*Roadfill* is soil material that is excavated in one place and used in road embankments in another place. The soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel, or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to

the water table is less than 1 foot. These soils may have layers of suitable material, but the material is less than 3 feet thick.

The soils are rated as a probable or improbable source of *sand* and *gravel*. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

# Soil Properties

---

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, given in the section "Detailed Soil Map Units," are explained in the following paragraphs.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties given in the map unit descriptions include the range of grain-size distribution, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

## Engineering Index Properties

Estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area are given in the detailed map unit descriptions and in table 5. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

*Depth* to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters

in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

*Classification* of the soils is determined according to the system adopted by the American Association of State Highway and Transportation Officials (1) and the Unified soil classification system (2).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

*Rock fragments* larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. The estimates are rounded to the nearest 5 percent.

## Physical and Chemical Properties

Estimates of some characteristics and features that

affect soil behavior are given in the detailed map unit descriptions. The estimates are based on field observations and on test data for these and similar soils. Some of the characteristics are indicated for layers in a typical profile of each soil.

*Structure* refers to the natural organization of soil particles into aggregates, or peds. These peds are formed in place, and identification requires field examination. Structure affects infiltration, soil productivity, and seedling emergence. Several basic shapes of peds are recognized in soils: platy, prismatic, columnar, blocky, and granular. Structureless soil layers are termed either massive or single grained. Structural terms are defined in the Glossary.

*Consistence* refers to the cohesion among soil particles and the soil's resistance to cracking or breaking when force is applied. Strength is determined both when the soil is dry (air dry) and when it is moist (field moisture capacity). Consistence terms are defined in the Glossary.

*Permeability* refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior. Permeability is given for the most restrictive layer above bedrock or a hardpan and below the surface layer.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in total inches of water for the soil profile. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Water-supplying capacity* refers to the amount of water available in the soil for plant growth in a normal year from the total of precipitation, run-on, and a capillary fringe minus runoff.

*Runoff* refers to the relative flow of water from the soil surface as determined by the characteristics of the soil profile, slope, climate, and cover.

*Soil reaction* is a measure of acidity or alkalinity and

is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

*Salinity* is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter, at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the map unit descriptions. Salinity affects the suitability of a soil for range seeding and crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

*Sodicity* is a measure of exchangeable sodium in the soil at saturation. It is expressed as a sodium adsorption ratio (SAR), or the ratio of sodium to calcium plus magnesium. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The sodicity of irrigated soils is affected by the quality of irrigation water and management of the soil. Hence, the sodicity of soils in individual fields can differ greatly from the value given in the map unit descriptions. Sodicity affects the suitability of a soil for range seeding and crop production and the stability of the soil if used as construction material.

*Shrink-swell potential* is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture

content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

*Erosion factor K* indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind erodibility groups* are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils containing rock fragments can occur in any group. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly

erodible. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

The *hazard of erosion* is an estimate of the likelihood of erosion by water and wind when the soil is bare. The hazard of erosion by water is determined on the basis of erosion factor K and the percent of slope. The hazard of erosion by wind is determined on the basis of the stability of the soil surface and the climate. The guidelines used in estimating the hazard of erosion are given in the Appendix.

## Soil and Water Features

Estimates of various soil and water features are given in the detailed map unit descriptions. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

*Flooding*, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

The frequency and duration of flooding and the time of year when flooding is most likely are given in the map unit descriptions.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

*High water table* (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. The depth to the seasonal high water table is indicated in the map unit descriptions. A water table that is seasonally high for less than 1 month is not indicated. Only saturated zones within a depth of about 6 feet are indicated.

*Depth to bedrock* is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and

on observations during soil mapping.

*Hardpans* are cemented or indurated subsurface layers within a depth of 5 feet. Such pans cause difficulty in excavation. Pans are classified as thin or thick. A thin pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A thick pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

*Potential for frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

*Corrosivity* pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

# Classification of the Soils

---

The system of soil classification used by the National Cooperative Soil Survey has six categories (18). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 6 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Aridisol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Orthid (*Orth*, meaning true, plus *id*, from Aridisol).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Camborthids (*Camb*, meaning change, plus *orthid*, a suborder of the Aridisols).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Camborthids.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is sandy-skeletal, mixed, mesic Typic Camborthids.

**SERIES.** The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

## Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (17). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (18). Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

### **Acana Family**

The Acana Family consists of shallow, well drained

soils that formed in residuum derived from andesitic rock with a component of volcanic ash (pumice). These soils are on mountain slopes, pediments, and plateaus. Slopes are 4 to 15 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Reference pedon:** Acana Family, very gravelly loamy sand, in an area of rangeland where gravel pavement covers about 90 percent of the surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; single grained; loose, nonsticky and nonplastic; many fine and very fine roots; many very fine interstitial pores; 40 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

A2—2 to 6 inches; light brownish gray (10YR 6/2) sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 10 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

Bt—6 to 10 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; many fine and medium interstitial pores; 30 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.

Bkqm1—10 to 16 inches; fractured indurated duripan; strongly calcareous.

Bkqm2—16 inches; continuous indurated duripan.

**Type location:** Mineral County, Nevada; approximately 21 miles south of Hawthorne; about 900 feet south and 900 feet east of the northwest corner of sec. 36, T. 5 N., R. 30 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from early July to October

**Soil temperature:** 47 to 49 degrees F

**Depth to indurated duripan:** 10 to 18 inches

**Control section:** Content of rock fragments—15 to 30 percent pebbles; clay content—20 to 30 percent

**A horizon:**

Structure—single grained or massive

**Bt horizon:**

Rock fragments—15 to 35 percent pebbles

### Advokay Series

The Advokay series consists of very shallow, well drained soils that formed in residuum derived from coarse grained tuff, rhyolite, granite, and related rocks. These soils are on pediments. Slopes are 2 to 8 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Haplargids

**Typical pedon:** Advokay sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Advokay-Budihol-Pumel association, where pebbles cover about 10 percent of the surface:

A1—0 to 1 inch; very pale brown (10YR 7/3) loamy sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 10 percent pebbles; slightly effervescent; neutral (pH 7.0); clear smooth boundary.

A2—1 to 6 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; slightly effervescent; mildly alkaline (pH 7.6); clear smooth boundary.

Bt1—6 to 8 inches; pale brown (10YR 6/3) gravelly sandy clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and few fine roots; common very fine tubular pores; 15 percent pebbles; few thin clay films bridging sand grains; slightly effervescent; mildly alkaline (pH 7.4); clear smooth boundary.

Bt2—8 to 11 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 20 percent pebbles; common thin clay films on faces of peds; lime coatings on rock fragments; slightly effervescent; mildly alkaline (pH 7.4); clear wavy boundary.

Cr—11 inches; weathered granite bedrock with thick lime seams.

**Type location:** Mineral County, Nevada; about 3 miles northwest of Ryan Canyon; about 1,450 feet north and 1,840 feet west of the southeast corner of sec.

13, T. 10 N., R. 31 E.; 38 degrees, 43 minutes, 28 seconds north latitude and 118 degrees, 27 minutes, 55 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Solum thickness and depth to soft bedrock:** 4 to 14 inches

**Control section:** Clay content—18 to 27 percent; content of rock fragments—15 to 35 percent, mostly 2 to 5 millimeters in diameter

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

**Carbonates:** Calcareous in all parts of the profile; slightly effervescent to violently effervescent

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Structure—platy or subangular blocky

#### Bt horizon:

Value—5 or 6 dry, 3 to 5 moist

Chroma—3 or 4

Clay content—20 to 35 percent

Rock fragments—15 to 35 percent, mostly 2 to 5 millimeters in diameter; 10 to 45 percent in some subhorizons of some pedons

Other features—lime and silica pendants commonly on pebbles in most pedons

### Annaw Series

The Annaw series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on fan piedmonts. Slopes are 2 to 8 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Annaw very gravelly loamy sand, 2 to 8 percent slopes, in an area of rangeland in the Terlco-Annaw-Izo association:

A—0 to 2 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft,

very friable, nonsticky and nonplastic; few very fine and fine roots; many fine and very fine interstitial pores; 35 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bw—2 to 13 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.3); abrupt wavy boundary.

Bk—13 to 16 inches; light yellowish brown (10YR 6/4) very gravelly loamy sand, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and common fine interstitial pores; few fine lime filaments throughout and on the lower faces of peds and few thin lime pendants on pebbles; 45 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

2C—16 to 43 inches; pale brown (10YR 6/3) extremely gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and fine and common medium and coarse interstitial pores; common faint traces of lime on the lower faces of peds; 65 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

3Btb—43 to 51 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and few fine tubular pores; faint patches of lime on the lower faces of peds; 15 percent pebbles; violently effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

3Bk'—51 to 60 inches; very pale brown (10YR 7/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and common fine interstitial pores; many medium coatings of lime on rock fragments; 65 percent pebbles; violently effervescent; moderately alkaline (pH 8.3).

**Type location:** Mineral County, Nevada; about 600 feet south and 200 feet west of the northeast corner of sec. 1, T. 10 N., R. 35 E.; 38 degrees, 46 minutes,

5 seconds north latitude and 118 degrees, 1 minute, 27 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture of the fraction less than 2 millimeters—sand, loamy sand, loamy fine sand; content of rock fragments—35 to 60 percent, mostly pebbles

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Carbonates:** Calcareous in all parts of the profile; slightly effervescent to violently effervescent

**Other features:** No buried B horizon below a depth of 40 inches in some pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—platy or subangular blocky

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—sandy loam, fine sandy loam

Rock fragments—10 to 40 percent pebbles, 0 to 10 percent cobbles

Clay films—few thin films in pores at the top of the horizon in some pedons

#### Bk horizon:

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—massive or subangular blocky

#### 2C horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—loamy sand, sand, loamy fine sand, loamy coarse sand; thin strata of sandy loam in some pedons

Structure—massive or weak subangular blocky

Rock fragments—35 to 65 percent pebbles, 0 to 15 percent cobbles

Other features—strata of gravelly material in some pedons; lime pendants on pebbles, disseminated in most pedons; lime coatings on pebbles in some horizons of some pedons

## Antholop Series

The Antholop series consists of shallow, well drained soils that formed in residuum derived from basalt. These soils are on plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Abruptic Xerollic Durargids

**Typical pedon:** Antholop stony sandy loam, 2 to 15 percent slopes, in an area of rangeland in the Antholop-Wedlar association:

A1—0 to 3 inches; light brownish gray (10YR 6/2) stony sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine and fine interstitial pores; 20 percent pebbles, 15 percent cobbles, 1 percent stones; neutral (pH 7.0); clear smooth boundary.

A2—3 to 6 inches; light gray (10YR 7/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; strong very thick platy structure parting to strong medium platy; slightly hard, friable, slightly sticky and nonplastic; common fine and medium roots; many very fine and fine vesicular and common fine tubular pores; 5 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

Bt1—6 to 12 inches; brown (7.5YR 5/4) clay, brown (7.5YR 5/4) moist; moderate fine prismatic structure parting to strong fine angular blocky; hard, firm, very sticky and very plastic; common medium and coarse roots; common very fine and fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bt2—12 to 16 inches; yellowish brown (10YR 5/6) gravelly clay, dark yellowish brown (10YR 4/6) moist; strong thin platy structure; friable, very sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; 25 percent pebbles; strongly alkaline (pH 8.6); clear wavy boundary.

Bqkm—16 to 60 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/4) moist; continuous silica-cemented laminae  $\frac{1}{8}$  to  $\frac{1}{4}$  inch thick underlain by strongly cemented material; extremely hard, brittle; 10 percent pebbles, 30 percent cobbles, 20 percent stones; violently effervescent; very strongly alkaline (pH 9.2).

**Type location:** Mineral County, Nevada; about 2,210 feet east and 2,340 feet south of the northwest corner of sec. 28, T. 6 N., R. 28 E.; 38 degrees, 16

minutes, 10 seconds north latitude and 118 degrees, 47 minutes, 25 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 47 to 52 degrees F

*Depth to duripan:* 14 to 20 inches

*Control section:* Clay content—40 to 55 percent; content of rock fragments—0 to 15 percent (mixed), as much as 25 percent in subhorizons

#### A horizon:

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Reaction—neutral or mildly alkaline

#### Bt horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—4 to 6

Clay content—40 to 55 percent

Reaction—moderately alkaline or strongly alkaline

Carbonates—noneffervescent or slightly effervescent

#### Bqkm horizon:

Value—7 or 8 dry, 6 or 7 moist

Chroma—1 or 2 dry, 3 to 6 moist

Reaction—strongly alkaline or very strongly alkaline

Carbonates—strongly effervescent to violently effervescent

Cementation—indurated laminar cap of 1/8- to 1/4-inch-thick silica laminae underlain by strongly cemented silica material

Rock fragments—40 to 60 percent, predominantly cobbles and stones

### Argalt Series

The Argalt series consists of very shallow, well drained soils that formed in residuum derived from basalt bedrock with a component of eolian material high in content of volcanic glass. These soils are on basalt flow plateaus. Slopes are 2 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Argalt very stony fine sandy loam, 4 to 30 percent slopes, in an area of rangeland in the

Argalt-Gabbvally association, where pebbles cover about 25 percent of the surface, cobbles about 10 percent, and stones about 15 percent:

A1—0 to 1 inch; pale brown (10YR 6/3) very stony fine sandy loam, brown (10YR 5/3) moist; moderate thin and medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine and fine vesicular pores; 20 percent pebbles, 10 percent cobbles, 15 percent stones; moderately alkaline (pH 8.4); clear wavy boundary.

A2—1 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; strong medium platy structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine and fine roots; common fine and medium vesicular and few fine tubular pores; moderately alkaline (pH 8.0); clear wavy boundary.

Bt—3 to 9 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine, fine, and medium roots; common fine interstitial and few fine and medium tubular pores; 10 percent pebbles; common thin clay films in pores and bridging mineral grains; moderately alkaline (pH 8.0); clear wavy boundary.

Bqkm—9 to 11 inches; white (10YR 8/2) fractured indurated duripan with a continuous laminar silica cap about 1/16 to 1/8 inch thick; extremely hard, extremely firm, nonsticky and nonplastic; violently effervescent; clear irregular boundary.

R—11 inches; hard basalt.

**Type location:** Mineral County, Nevada; approximately 1,750 feet west and 2,000 feet south of the northeast corner of sec. 8, T. 7 N., R. 36 E.; 38 degrees, 28 minutes, 47 seconds north latitude and 117 degrees, 59 minutes, 28 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 57 degrees F

*Control section:* Clay content—15 to 25 percent; content of rock fragments—5 to 15 percent

*Depth to duripan:* 8 to 14 inches

*Depth to bedrock:* 10 to 20 inches

*Reaction throughout the profile:* Mildly alkaline to moderately alkaline

*Other features:* Pan fragments common in the control section, directly above the duripan in most pedons

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist  
 Chroma—2 or 3

*Bt horizon:*

Value—6 or 7 dry, 4 or 5 moist  
 Chroma—3 or 4  
 Texture—loam, clay loam  
 Clay content—25 to 35 percent  
 Rock fragments—5 to 15 percent  
 Structure—weak or moderate subangular blocky  
 Carbonates—noneffervescent or slightly effervescent

*Bqkm horizon:*

Value—7 or 8 dry, 5 to 7 moist  
 Chroma—1 or 2 dry, 3 or 4 moist  
 Reaction—moderately alkaline or strongly alkaline

### Armespan Series

The Armespan series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on fan piedmont remnants. Slopes are 2 to 30 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Durixerollic Calciorthids

**Typical pedon:** Armespan very gravelly sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Armespan-Whilphang-Wrango association, where pebbles cover about 40 percent of the surface:

A1—0 to 1 inch; light gray (10YR 7/2) very gravelly sandy loam, grayish brown (10YR 5/2) moist; moderate thin platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial and common very fine vesicular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

A2—1 to 4 inches; light gray (10YR 7/2) sandy loam, grayish brown (10YR 5/2) moist; moderate thin and medium platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial and common very fine vesicular pores; 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bw—4 to 9 inches; very pale brown (10YR 7/3) gravelly sandy loam, brown (10YR 5/3) moist; weak fine and

medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and medium roots; many very fine interstitial pores; 15 percent pebbles; violently effervescent; strongly alkaline (pH 8.5); gradual wavy boundary.

Bk—9 to 19 inches; white (10YR 8/2) gravelly sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine to medium roots; common very fine interstitial pores; 30 percent pebbles; soft powdery lime throughout the horizon; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bkq—19 to 31 inches; white (10YR 8/2) very gravelly sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine interstitial pores; 40 percent pebbles; 25 percent strong discontinuous silica- and 25 percent lime-cemented plates and pendants on undersides of rock fragments; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

C—31 to 60 inches; light gray (10YR 7/2) very gravelly loamy coarse sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 45 percent pebbles; lime coatings on undersides of rock fragments; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Mineral County, Nevada; approximately 1,600 feet north and 1,500 feet west of the approximate southeast corner of sec. 9, T. 7 N., R. 37 E.; 38 degrees, 28 minutes, 37 seconds north latitude and 117 degrees, 53 minutes, 0 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Control section:* Clay content—10 to 18 percent; content of rock fragments—35 to 50 percent

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

*Carbonates:* Strongly effervescent or violently effervescent throughout the profile

*Depth to Bk horizon:* 5 to 10 inches

*Thickness of calcic horizon:* 15 to 35 inches

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist  
 Chroma—2 or 3

**Bw horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—sandy loam, loam

**Bk horizon:**

Value—6 to 8 dry, 5 to 7 moist

Chroma—2 or 3 dry or moist

Texture—sandy loam, loam

Clay content—12 to 18 percent

Rock fragments—15 to 35 percent, dominantly pebbles

Structure—massive, weak platy, or subangular blocky

Carbonates—soft powdery lime throughout the horizon; 10 to 35 percent calcium carbonate equivalent

**Bkq horizon:**

Value—7 or 8 dry, 6 or 7 moist

Chroma—2 or 3 dry or moist

Texture—sandy loam, coarse sandy loam

Clay content—10 to 18 percent

Rock fragments—35 to 50 percent, predominantly pebbles

Carbonates—10 to 35 percent calcium carbonate equivalent

Other features—20 to 50 percent weak to strong discontinuous silica and lime cementation in the form of plates and pendants under rock fragments

**C horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Texture—loamy sand, loamy coarse sand

Clay content—5 to 10 percent

Rock fragments—35 to 65 percent, predominantly pebbles

Carbonates—lime pendants on undersides of rock fragments

**Armoine Series**

The Armoine series consists of shallow, well drained soils that formed in residuum and colluvium derived from granitic rock. These soils are on mountain slopes, hills, and rock pediments. Slopes are 4 to 50 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Armoine very gravelly sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Armoine-Beelem association:

A—0 to 4 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial and few fine vesicular pores; 45 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary.

Bt—4 to 15 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine to medium and few coarse roots; common very fine tubular and few very fine interstitial pores; 55 percent pebbles; common thin clay films on faces of peds; mildly alkaline (pH 7.4); clear smooth boundary.

Cr—15 inches; weathered granitic bedrock.

**Type location:** Mineral County, Nevada; approximately 1,200 feet south and 1,000 feet west of the northeast corner of sec. 30, T. 8 N., R. 37½ E.; 38 degrees, 31 minutes, 25 seconds north latitude and 117 degrees, 47 minutes, 48 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Moist in winter and spring, mostly dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to paralithic contact:** 14 to 20 inches

**Control section:** Clay content—18 to 25 percent; content of rock fragments—35 to 55 percent (5 percent cobbles and stones and more than 50 percent pebble-size fragments 2 to 5 millimeters in diameter)

**A horizon:**

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 or 3

Reaction—mildly alkaline or moderately alkaline

Carbonates—noneffervescent or slightly effervescent

**Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—sandy clay loam, sandy loam

Rock fragments—35 to 55 percent, mostly pebbles  
 Reaction—mildly alkaline or strongly alkaline  
 Carbonates—commonly noneffervescent; slightly effervescent in the lower part of some pedons

**Bk horizon:**

Reaction—moderately alkaline or strongly alkaline  
 Carbonates—strongly effervescent or violently effervescent

**Baldy Variant**

The Baldy Variant consists of very deep, moderately well drained soils that formed in alluvium derived from mixed rock sources including andesite and granite. These soils are on high mountain basins and dissected fans. Slopes are 0 to 4 percent. Mean annual precipitation is about 18 inches, and mean annual temperature is about 44 to 46 degrees F.

**Taxonomic class:** Fine-silty, mixed, nonacid Typic Cryorthents

**Reference pedon:** Baldy Variant silt loam, in an area of rangeland:

- A1—0 to 3 inches; gray and light gray (10YR 6/1) silt loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine roots; few fine tubular pores; slightly acid (pH 6.4); abrupt smooth boundary.
- A2—3 to 10 inches; gray and light gray (10YR 6/1) silt loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many fine and medium interstitial and tubular pores; slightly acid (pH 6.4); abrupt smooth boundary.
- C1—10 to 16 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many fine interstitial pores; neutral (pH 6.6); abrupt smooth boundary.
- C2—16 to 24 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; neutral (pH 6.6); abrupt smooth boundary.
- 2C3—24 to 32 inches; brown (10YR 5/3) silty clay loam, very dark brown (10YR 2/2) moist; massive; soft, friable, sticky and plastic; few fine roots; very few very fine tubular and interstitial pores; neutral (pH 6.6); abrupt smooth boundary.
- 3C4—32 to 44 inches; pale brown (10YR 6/3) very fine sandy loam, brown and dark brown (10YR 4/3)

moist; massive; soft, friable, slightly sticky and slightly plastic; few fine roots; common very fine interstitial pores; neutral (pH 6.6); abrupt wavy boundary.

- 4C5—44 to 56 inches; pinkish gray (7.5YR 7/2) very gravelly sand, dark brown and brown (7.5YR 4/3) moist; massive; soft, friable, nonsticky, nonplastic; few roots; common fine and medium interstitial pores; 50 percent pebbles; neutral (pH 6.6).

**Type location:** Mineral County, Nevada; approximately 16 miles south of Hawthorne; about 2,000 feet south and 200 feet east of the northwest corner of sec. 12, T. 5 N., R. 29 E.

**Range in Characteristics**

**Soil moisture:** Moist in winter, spring, and early fall, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Mean annual soil temperature:** 44 to 46 degrees F

**Mean summer soil temperature:** 56 to 59 degrees F

**Control section:** Texture—silt loam, silty clay loam, very fine sandy loam; clay content—18 to 27 percent

**C horizon:**

Texture—silty clay loam, very fine sandy loam; very gravelly sand below the control section

**Bango Series**

The Bango series consists of very deep, well drained soils that formed in alluvium over lacustrine deposits. These soils are on lake-plain terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Haplic Natrargids

**Typical pedon:** Bango sandy loam, 0 to 2 percent slopes, in an area of rangeland in the Bango-Hawsley complex, 0 to 4 percent slopes, where pebbles cover about 10 percent of the surface:

- A1—0 to 2 inches; pale brown (10YR 6/3) gravelly sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial pores; 15 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary.
- A2—2 to 6 inches; light gray (10YR 7/2) loam, brown (10YR 5/3) moist; moderate to strong thin and medium platy structure; slightly hard, very friable,

slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial and common fine to medium vesicular pores; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary.

**Btk**—6 to 12 inches; yellowish brown (10YR 5/6) sandy clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, very friable, sticky and plastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 5 percent pebbles; slightly effervescent with violently effervescent pockets; strongly alkaline (pH 9.0); clear wavy boundary.

**Bk**—12 to 24 inches; yellowish brown (10YR 5/4) coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable, slightly sticky and nonplastic; few very fine to medium roots; common very fine interstitial pores; 5 percent pebbles; slightly effervescent with violently effervescent pockets and channels; strongly alkaline (pH 8.6); clear smooth boundary.

**C1**—24 to 29 inches; yellowish brown (10YR 5/6) loamy coarse sand, dark yellowish brown (10YR 4/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine to medium interstitial pores; 10 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

**2C2**—29 to 37½ inches; light gray (5Y 7/2) silt loam, olive (5Y 5/3) moist; moderate thin platy structure; hard, very friable, slightly sticky and slightly plastic; few very fine roots; few fine tubular pores; slightly effervescent to strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

**2C3**—37½ to 40 inches; pale olive (5Y 6/3) loamy fine sand, olive (5Y 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few fine tubular and common very fine interstitial pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary.

**2C4**—40 to 42½ inches; white (5Y 8/2) silty clay loam, pale olive (5Y 6/3) moist; strong thin platy structure parting to strong fine angular blocky; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; many very dark gray (10YR 3/1) manganese stains; violently effervescent with thin lime coatings on faces of peds; strongly alkaline (pH 8.6); abrupt smooth boundary.

**2C5**—42½ to 46 inches; pale olive (5Y 6/3) loamy fine

sand, olive (5Y 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few fine tubular and common very fine interstitial pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary.

**2C6**—46 to 60 inches; light brownish gray (2.5Y 6/2) stratified very fine sandy loam to silt loam with thin strata of loamy very fine sand, olive (5Y 4/3) moist; many large prominent strong brown (7.5Y 5/8) mottles along plate faces and common fine to medium prominent strong brown (7.5YR 5/8) mottles along pores and throughout matrix; massive, but breaks out in plates; hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine and few medium tubular pores; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; in Schurz area; about 2,000 feet east and 500 feet south of the northwest corner of sec. 4, T. 12 N., R. 29 E.; 38 degrees, 59 minutes, 41 seconds north latitude and 118 degrees, 40 minutes, 8 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods in winter and spring

*Soil temperature:* 53 to 57 degrees F

*Combined thickness of A and Bt horizons:* 6 to 20 inches

#### A horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Structure—moderate or strong medium or thick platy or medium or coarse subangular blocky

#### Bt horizon:

Hue—7.5YR or 10YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 6

Texture—loam, sandy clay loam, clay loam

Clay content—20 to 30 percent

Structure—weak medium or coarse prismatic, commonly parting to weak or moderate fine or medium subangular blocky

Reaction—moderately alkaline or strongly alkaline

Other features—discontinuous dendritic tuffa directly underlying the Btk horizon or within a depth of 10 inches of the base of the Btk horizon in some pedons

#### C horizons:

Texture—finely stratified loamy coarse sand to silty clay

Reaction—moderately alkaline or strongly alkaline

Relict iron mottles—commonly at depths below 24 inches  
Other features—some gravelly substrata

### **Barnmot Series**

The Barnmot series consists of very deep, well drained soils that formed in residuum and colluvium derived from semiconsolidated lake sediments. These soils are on uplifted terraces, low hills, fan remnant side slopes, and partial ballenas. Slopes are 8 to 75 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Typic Torriorthents

**Typical pedon:** Barnmot gravelly clay loam, 15 to 50 percent slopes, in an area of rangeland in the Barnmot-Haarvar association:

A—0 to 1 inch; light gray (10YR 7/2) gravelly clay loam, brown (10YR 5/3) moist; moderate thin and medium platy structure; soft, very friable, sticky and plastic; no roots; common very fine interstitial and few very fine vesicular pores; 25 percent pebbles; moderately alkaline (pH 8.3); abrupt smooth boundary.

C1—1 to 4 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; moderate fine subangular blocky structure parting to moderate fine granular; soft, very friable, very sticky and very plastic; few very fine roots; many very fine interstitial pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

C2—4 to 60 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; massive; hard, friable, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5).

**Type location:** Mineral County, Nevada; approximately 600 feet north and 600 feet west of the southeast corner of sec. 18, T. 10 N., R. 34 E; 38 degrees, 43 minutes, 11 seconds north latitude and 118 degrees, 13 minutes, 10 seconds west longitude.

#### **Range in Characteristics**

**Soil moisture:** Usually dry in summer and autumn; moist for short periods during spring and winter

**Soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—35 to 55 percent; content of rock fragments—less than 15 percent

**A horizon:**

Value—5 to 7 dry, 4 or 5 moist  
Chroma—2 or 3

**C horizon:**

Hue—7.5YR, 10YR, or 2.5Y  
Value—5 to 8 dry, 4 to 6 moist  
Chroma—2 to 4 dry or moist  
Texture—clay or clay loam with 25 to 40 percent silt  
Clay content—35 to 55 percent  
Reaction—moderately alkaline or strongly alkaline  
Structure—prismatic, subangular blocky, or massive

### **Beano Series**

The Beano series consists of shallow, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on alluvial fan piedmonts, alluvial fans, and alluvial fan remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Haplic Durargids

**Typical pedon:** Beano sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Beano-Annaw association:

A1—0 to 3 inches; pale brown (10YR 6/3) loamy coarse sand, dark grayish brown (10YR 4/2) moist; weak thick platy structure; soft, very friable, nonsticky and nonplastic; many very fine and fine interstitial pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

A2—3 to 7 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many fine and medium and common very fine roots; many fine interstitial and common very fine and fine vesicular pores; 10 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bt—7 to 13 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; common fine interstitial and common very fine and fine tubular pores; 35 percent pebbles; common moderately thick clay films on peds; slightly effervescent; few fine lime filaments in tubular pores; strongly alkaline (pH 8.8); clear wavy boundary.

**Bqk**—13 to 18 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial and common fine tubular pores; 40 percent pebbles; common thin clay bridges between grains; violently effervescent; very strongly alkaline (pH 9.4); abrupt wavy boundary.

**Bqkm**—18 to 35 inches; light gray (10YR 7/2) strongly cemented duripan with weakly cemented and noncemented interbedded layers; pale brown (10YR 6/3) moist; white (10YR 8/2) discontinuous indurated silica laminae in pores and bridging some pebbles; very pale brown (10YR 7/3) moist; alternating massive and single grained; very hard, extremely firm, brittle; common fine and medium roots; few fine tubular pores; 40 percent pebbles; violently effervescent; very strongly alkaline (pH 9.5); gradual smooth boundary.

**2Bk**—35 to 60 inches; pale brown (10YR 6/3) stratified extremely gravelly coarse sand and extremely gravelly loamy sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; common micro roots; many very fine and fine interstitial pores; 65 percent pebbles; violently effervescent; very strongly alkaline (pH 9.2).

**Type location:** Mineral County, Nevada; about 1,500 feet north and 300 feet west of the southeast corner of sec. 16, T. 10 N., R. 32 E.; 38 degrees, 43 minutes, 17 seconds north latitude and 118 degrees, 24 minutes, 44 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 30 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Depth to duripan:** 15 to 20 inches

**Control section:** Texture—loam or clay loam; clay content—18 to 35 percent; content of rock fragments—35 to 60 percent, dominantly pebbles

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Reaction—moderately alkaline or strongly alkaline

Carbonates—noneffervescent or slightly effervescent

#### Bt horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4 dry or moist

Texture—loam, sandy clay loam, clay loam

Clay content—25 to 35 percent

Rock fragments—35 to 60 percent, dominantly pebbles greater than 5 millimeters in diameter

Structure—strong or moderate subangular blocky

Reaction—moderately alkaline to very strongly alkaline

Carbonates—slightly effervescent to violently effervescent; lime coatings on bottoms of coarse fragments in the lower portions

#### Bqkm horizon:

Value—6 to 8

Chroma—1 to 3 dry or moist

Rock fragments—35 to 60 percent, dominantly pebbles

Cementation—strongly cemented duripan with alternating strata of weakly cemented or noncemented materials; few discontinuous laminar caps on coarse fragments in some pedons

Thickness—10 to 20 inches

#### 2Bk horizon:

Value—6 or 7 dry, 5 or 6 moist

Chroma—2 or 3 dry or moist

Texture—coarse sand, sand, loamy sand, sandy loam, typically stratified or in the form of lenses

Rock fragments—60 to 75 percent, dominantly pebbles

Reaction—strongly alkaline or very strongly alkaline

### Beelem Series

The Beelem series consists of very shallow, well drained soils that formed in residuum and colluvium derived from welded tuffs. These soils are on mountain slopes, hills, and pediments. Slopes are 15 to 75 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic Lithic Xeric Torriorthents

**Typical pedon:** Beelem very gravelly sandy loam, 30 to 75 percent slopes, in an area of woodland in the Beelem-Bellehelen-Stewval association, where cobbles cover about 5 percent of the surface and pebbles cover about 40 percent:

A1—0 to 1 inch; light yellowish brown (2.5Y 6/4) very gravelly sandy loam, olive brown (2.5Y 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; no roots; many very fine interstitial pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

A2—1 to 3 inches; light yellowish brown (2.5Y 6/4) gravelly sandy loam, olive brown (2.5Y 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine interstitial pores; 25 percent pebbles; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

R—3 inches; welded tuff; weathered in the upper 4 inches with lime coatings in fractures; becomes hard at a depth of 7 inches.

**Type location:** Mineral County, Nevada; about 2,400 feet north and 600 feet east of the southwest corner of sec. 10, T. 9 N., R. 34 E.; 38 degrees, 38 minutes, 56 seconds north latitude and 118 degrees, 10 minutes, 57 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Control section:* Clay content—10 to 18 percent; content of rock fragments—15 to 35 percent, predominantly pebbles 2 to 5 millimeters in diameter

*Depth to bedrock:* 3 to 9 inches

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline

*Carbonates:* Slightly effervescent to violently effervescent

*A horizon:*

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4 dry or moist; color variations due to lithochromic influence

### Bellehelen Series

The Bellehelen series consists of very shallow, well drained soils that formed in residuum and colluvium derived from volcanic rocks. These soils are on hills and mountain slopes. Slopes are 8 to 75 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Argixerolls

**Typical pedon:** Bellehelen gravelly fine sandy loam, 30 to 50 percent slopes, in an area of woodland in the Stewval-Bellehelen-Rock outcrop association, where pebbles cover about 50 percent of the surface, cobbles about 10 percent, and stones about 2 percent:

A—0 to 2 inches; grayish brown (10YR 5/2) very gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; common very fine interstitial and few very fine tubular pores; 45 percent pebbles; neutral (pH 6.6); clear smooth boundary.

Bt1—2 to 7 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 45 percent pebbles; few thin clay films on faces of peds; neutral (pH 6.8); clear wavy boundary.

Bt2—7 to 11 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 55 percent pebbles; common thin clay films on faces of peds; neutral (pH 7.0); clear wavy boundary.

R—11 inches; hard, welded rhyolitic tuff, weathered in the upper 3 inches.

**Type location:** Mineral County, Nevada; about 1.5 miles south of Miller Mountain; approximately 2,500 feet north and 500 feet west of the southeast corner of sec. 9, T. 2 N., R. 34 E.; 38 degrees, 2 minutes, 30 seconds north latitude and 118 degrees, 11 minutes, 23 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 47 to 53 degrees F

*Depth to bedrock:* 7 to 14 inches

*Thickness of the mollic epipedon:* 7 to 10 inches; may include entire Bt horizon or the upper part when mixed to a depth of 7 inches

*Control section:* Texture of the fraction less than 2 millimeters—loam, sandy clay loam, or clay loam;

clay content—18 to 35 percent; content of rock fragments—35 to 60 percent

*Reaction throughout the profile:* Neutral or mildly alkaline

*A horizon:*

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3 dry or moist

*Bt horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry or moist

Texture of the fraction less than 2 millimeters—loam, sandy clay loam, or clay loam; may include subhorizons with clay content greater than 35 percent

### **Belted Series**

The Belted series consists of very shallow, well drained soils that formed in mixed alluvium. These soils are on fan piedmont remnants, alluvial fans, fan remnants, and fan skirts. Slopes are 2 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haplic Durargids

**Typical pedon:** Belted gravelly sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Belted-Koyen association, where pebbles cover about 15 percent of the surface and cobbles cover about 5 percent:

A1—0 to 1 inch; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; very few fine roots; common very fine and fine interstitial and few very fine and fine tubular pores; 15 percent fine pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2—1 to 3 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; strong coarse and very coarse platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine, fine, and medium vesicular and few fine tubular pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary.

Bt—3 to 7 inches; light brown (7.5YR 6/4) light clay loam, dark brown (7.5YR 4/4) moist; strong medium subangular blocky structure parting to moderate

medium platy; slightly hard, friable, sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine tubular and few very fine and fine vesicular pores; many moderately thick clay films on faces of pedis and lining pores; colloidal stains on mineral grains; 5 percent pebbles; slightly effervescent; very strongly alkaline (pH 9.4); clear wavy boundary.

Bqkm1—7 to 9 inches; light brown (7.5YR 6/4) strongly cemented duripan; strong medium and thick platy structure; extremely hard, very firm; strongly effervescent; very strongly alkaline (pH 9.6); abrupt wavy boundary.

Bqkm2—9 to 24 inches; brown (7.5YR 5/4) strongly cemented duripan; massive; extremely hard, very firm; common medium and large concretions of lime; violently effervescent; very strongly alkaline (pH 9.6); clear wavy boundary.

2Cqk—24 to 60 inches; light brown (7.5YR 6/4) gravelly sandy loam, brown (7.5YR 4/4) moist; massive; stratified discontinuous layers of strong and weak silica cementation; slightly hard to very hard, firm to very firm, nonsticky and nonplastic; 15 percent pebbles; common medium and large lime concretions; violently effervescent; very strongly alkaline (pH 9.6).

**Type location:** Mineral County, Nevada; about 2,000 feet south and 1,500 feet east of the northwest corner of sec. 33, T. 10½ N., R. 31 E.; 38 degrees, 46 minutes, 40 seconds north latitude and 118 degrees, 31 minutes, 20 seconds west longitude.

### **Range in Characteristics**

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Depth to duripan:* 6 to 14 inches

*Reaction throughout the profile:* Moderately alkaline to very strongly alkaline

*Control section:* Clay content—15 to 28 percent; content of rock fragments—0 to 25 percent

*Depth to 2C horizon:* 24 to 61 inches

*A horizon:*

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Structure—platy, subangular blocky, or massive parting to granular

Carbonates—slightly to strongly effervescent

**Bt horizon:**

Hue—7.5YR or 10YR  
 Value—5 to 7 dry, 4 or 5 moist  
 Chroma—2 to 4 dry or moist  
 Structure—subangular blocky, platy, or massive parting to granular  
 Texture—sandy clay loam, sandy loam, loam, or clay loam  
 Clay content—18 to 30 percent  
 Rock fragments—0 to 30 percent  
 Carbonates—slightly to strongly effervescent

**Bqkm horizon:**

Structure—platy or massive; strongly cemented continuous laminae, rarely more than ½ inch thick

**C1 horizon:**

Texture—sandy loam, fine sandy loam  
 Rock fragments—0 to 35 percent

**2C horizon:**

Texture—lake sediments; texture varied  
 Hue—10YR or 7.5YR  
 Value—6 or 7 dry, 4 or 5 moist  
 Chroma—2 to 4 dry or moist  
 Carbonates—noneffervescent to violently effervescent; a Btk horizon in some pedons

**Bijorja Series**

The Bijorja series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from granitic rocks. These soils are on rock pediment remnants. Slopes are 8 to 30 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Xerollic Camborthids

**Typical pedon:** Bijorja loamy coarse sand, 8 to 30 percent slopes, in an area of rangeland in the Bijorja-Petspring association:

- A1—0 to 2 inches; grayish brown (10YR 5/2) coarse sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few fine and common very fine roots; many very fine interstitial pores; 15 percent pebbles; neutral (pH 7.0); clear smooth boundary.
- A2—2 to 4 inches; pale brown (10YR 6/3) loamy coarse sand, dark brown (10YR 3/3) moist; weak thin and medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial pores; 5 percent

pebbles; neutral (pH 7.0); clear wavy boundary.

Bw1—4 to 7 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial pores; 20 percent pebbles; neutral (pH 7.2); clear wavy boundary.

Bw2—7 to 10 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine interstitial and few very fine tubular pores; 30 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary.

Bk—10 to 30 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial and few very fine tubular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear irregular boundary.

Cr—30 inches; highly weathered granodiorite with few pockets of soil material.

**Type location:** Mineral County, Nevada; about 1 mile southeast of Hawthorne dump site; about 2,000 feet south and 200 feet east of the northwest corner of sec. 5, T. 7 N., R. 30 E.; 38 degrees, 29 minutes, 43 seconds north latitude and 118 degrees, 40 minutes, 27 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Depth to soft bedrock:** 20 to 40 inches

**Control section:** Clay content—10 to 18 percent; content of rock fragments—15 to 35 percent, mostly pebbles 2 to 5 millimeters in diameter

**A horizon:**

Value—5 or 6 dry, 3 or 4 moist  
 Chroma—2 or 3 dry or moist

**Bw horizon:**

Chroma—3 or 4 dry or moist  
 Reaction—mildly alkaline or moderately alkaline

**Bk horizon:**

Carbonates—strongly effervescent or violently effervescent  
 Reaction—mildly alkaline or moderately alkaline

**Blacktop Series**

The Blacktop series consists of very shallow, somewhat excessively drained soils that formed in residuum and colluvium derived from volcanic rocks. These soils are on mountains and hills. Slopes are 8 to 75 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents

**Typical pedon:** Blacktop very gravelly sandy loam, 30 to 75 percent slopes, in an area of rangeland in the Blacktop-Downeyville-Rock outcrop association:

- A1—0 to 1 inch; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak thin platy structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine interstitial and few very fine vesicular pores; 55 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.
- A2—1 to 4 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine interstitial and few very fine tubular pores; 55 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.3); abrupt irregular boundary.
- R—4 inches; hard metavolcanic bedrock.

**Type location:** Mineral County, Nevada; approximately 1,900 feet north and 530 feet west of the southeast corner of sec. 9, T. 9 N., R. 31 E.; 38 degrees, 39 minutes, 18 seconds north latitude and 118 degrees, 31 minutes, 21 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to bedrock:** 4 to 10 inches

**Control section:** Texture of the fraction less than 2 millimeters—sandy loam or fine sandy loam; content of rock fragments—35 to 70 percent

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

**Carbonates:** Slightly effervescent to strongly effervescent

**Chroma:** 2 to 4 dry or moist

**Bluewing Series**

The Bluewing series consists of very deep, excessively drained soils that formed in very gravelly, sandy alluvium derived from mixed rock sources. These soils are in channels and on inset fans. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Bluewing very gravelly loamy sand, frequently flooded, 2 to 4 percent slopes, in an area of rangeland in the Luning-Hawsley-Bluewing association:

- A—0 to 9 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; many fine and very fine interstitial pores; 40 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.
- C—9 to 14 inches; light brownish gray (10YR 6/2) very gravelly sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few medium and many fine and very fine roots; many fine and very fine interstitial pores; 30 percent pebbles, 10 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.
- 2Ck—14 to 20 inches; light brownish gray (10YR 6/2) very gravelly coarse sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few medium and common fine and very fine roots; many fine and very fine interstitial pores; 50 percent pebbles, 5 percent cobbles; few faint carbonate coatings on the lower surface of rock fragments; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- 3C1—20 to 34 inches; light brownish gray (10YR 6/2) very gravelly coarse sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few medium and common fine and very fine roots; many fine and very fine interstitial pores; 50 percent pebbles, 10 percent cobbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- 4C2—34 to 60 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; many fine and very fine interstitial pores; 50 percent pebbles;

strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; approximately 2,640 feet west and 1,320 feet south of the northeast corner of sec. 18, T. 13 N., R. 34 E.; 38 degrees, 57 minutes, 9 seconds north latitude and 118 degrees, 12 minutes, 57 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist intermittently in winter and early spring

*Soil temperature:* 53 to 59 degrees F

*Reaction throughout the profile:* Mildly alkaline to strongly alkaline

#### A horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4

Structure—platy, massive, or single grained

Consistence—loose, soft or slightly hard

Reaction—noneffervescent to violently effervescent

#### Bk horizons:

Hue—10YR or 2.5Y

Value—5 to 8 dry, 3 to 5 moist

Chroma—2 to 4

Texture—dominantly loamy coarse sand or coarse sand; may include strata ranging from loamy sand to loam

Clay content—4 to 8 percent

Rock fragments—50 to 80 percent, mainly pebbles  $\frac{3}{4}$  to  $1\frac{1}{4}$  inch in diameter; as much as 25 percent cobbles and stones

Structure—massive or single grained

### Bombadil Family

The Bombadil Family consists of shallow, well drained soils that formed in residuum derived from andesitic rock. These soils are on mountain slopes, pediments, and plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Loamy, mixed, mesic Lithic Xerollic Haplargids

**Reference pedon:** Bombadil Family, very gravelly sand, in an area of rangeland where gravel pavement covers about 70 percent of the surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly sand, very dark grayish brown (10YR 3/2) moist; single grained; loose, nonsticky and

nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 40 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

A2—2 to 6 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine interstitial pores; 20 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

Bt—6 to 9 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine interstitial pores; 10 percent pebbles; neutral (pH 6.8); abrupt wavy boundary.

R—9 inches; unweathered andesitic bedrock.

**Type location:** Mineral County, Nevada; approximately 21 miles south of Hawthorne; about 1,000 feet south and 1,000 feet east of the northwest corner of sec. 36, T. 5 N., R. 30 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from early July to October

*Soil temperature:* 47 to 49 degrees F

*Depth to bedrock:* 9 to 15 inches

*Control section:* Clay content—10 to 25 percent; content of rock fragments—10 to 25 percent pebbles

#### A horizon:

Structure—single grained or massive

#### Bt horizon:

Clay content—18 to 30 percent

Texture—loam, clay loam

Rock fragments—5 to 15 percent pebbles

### Borealis Series

The Borealis series consists of moderately deep, well drained soils that formed in residuum derived from basalt with a component of volcanic ash. These soils are on basalt plateaus. Slopes are 4 to 30 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Fine, mixed, frigid Abruptic Durixeralfs

**Typical pedon:** Borealis very stony fine sandy loam, 8 to 15 percent slopes, in an area of woodland in the Borealis-Antholop-Rock outcrop association, where

pebbles cover about 15 percent of the surface, cobbles about 15 percent, and stones about 5 percent:

- A1—0 to 2 inches; grayish brown (10YR 5/2) very stony loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 15 percent pebbles, 15 percent cobbles, 5 percent stones; neutral (pH 6.6); clear wavy boundary.
- A2—2 to 6 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure parting to moderate fine and medium subangular blocky; soft, very friable, nonsticky and nonplastic; common fine and medium roots; common very fine and fine interstitial pores; 5 percent pebbles; neutral (pH 6.8); gradual smooth boundary.
- E—6 to 11 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 5/3) moist; strong thick platy structure; soft, very friable, slightly sticky and nonplastic; common very fine to medium roots; many very fine and fine interstitial and few fine tubular and vesicular pores; 10 percent pebbles; neutral (pH 7.2); abrupt wavy boundary.
- Bt1—11 to 17 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; strong fine and medium angular blocky structure; hard, firm, very sticky and plastic; common coarse to fine roots; common very fine tubular pores; many thick clay films on faces of peds; 20 percent pebbles; neutral (pH 7.2); clear wavy boundary.
- Bt2—17 to 23 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong coarse and medium angular blocky structure; hard, firm, very sticky and plastic; many very fine and common fine and medium roots; common fine tubular pores; many thick clay films on faces of peds; 10 percent pebbles; neutral (pH 7.2); clear wavy boundary.
- Bqkm—23 to 40 inches; white (10YR 8/1) indurated duripan, yellow (10YR 7/6) moist; 35 percent cobbles, 30 percent pebbles; 1/8- to 1/4-inch laminar cap alternating with strongly cemented lime and silica; violently effervescent; very strongly alkaline (pH 9.6); abrupt wavy boundary.
- R—40 inches; hard, unweathered basalt bedrock.

**Type location:** Mineral County, Nevada; approximately 1,290 feet south and 650 feet east of the northwest corner of sec. 3, T. 5 N., R. 28 E., just west of Aurora Crater; 38 degrees, 19 minutes, 29 seconds

north latitude and 118 degrees, 50 minutes, 11 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

*Soil temperature:* 45 to 47 degrees F

*Control section:* Texture of the fraction less than 2 millimeters—clay loam or clay; clay content—35 to 45 percent; content of rock fragments—15 to 35 percent

*Depth to duripan:* 20 to 35 inches

*Depth to bedrock:* 35 to 40 inches

*A horizon:*

Value—5 to 7 dry, 4 to 6 moist

Chroma—2 or 3

*B horizon:*

Value—4 to 6

Chroma—3 to 6 dry or moist

Clay content—35 to 45 percent

Rock fragments—15 to 35 percent, 10 to 45 percent in subhorizons; predominantly pebbles

Reaction—neutral or mildly alkaline

*Bqkm horizon:*

Cementation—1/8- to 1/4-inch-thick continuous silica-cemented laminae stratified with strongly cemented material between pockets of weakly cemented material in some pedons

Rock fragments—35 to 65 percent, predominantly pebbles and cobbles

Reaction—moderately alkaline to very strongly alkaline

### Borealis Family

The Borealis Family consists of moderately deep, well drained soils that formed in residuum derived from basalt. These soils are on basalt flows. Slopes are 4 to 35 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, mixed, frigid Abruptic Durixeralfs

**Reference pedon:** Borealis Family, very cobbly sandy loam, in an area of rangeland where cobbles cover about 20 percent of the surface and pebbles cover 5 to 10 percent:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, friable, nonsticky and nonplastic; many very fine roots; many very fine tubular and interstitial pores; 40 percent cobbles, 10 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

A2—2 to 8 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 20 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

Bt1—8 to 14 inches; brown (10YR 5/3) clay, brown and dark brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; slightly hard, friable, sticky and plastic; many very fine roots; many very fine interstitial pores; slightly acid (pH 6.4); abrupt smooth boundary.

Bt2—14 to 20 inches; brown (7.5YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to strong fine and medium angular blocky; very hard, firm, very sticky and very plastic; few fine roots; many very fine interstitial pores; 10 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

Bqm—20 to 24 inches; indurated duripan in the form of laminar caps on bedrock.

R—24 inches; bedrock.

**Type location:** Mineral County, Nevada; approximately 17 miles southwest of Hawthorne; about 1,200 feet north and 1,200 feet east of the southwest corner of sec. 8, T. 5 N., R. 29 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 46 degrees F

**Depth to duripan:** 20 to 40 inches

**Depth to bedrock:** 24 to 40 inches

**Bt horizon:**

Clay content—40 to 50 percent

Rock fragments—5 to 10 percent pebbles

#### Bouncer Series

The Bouncer series consists of very shallow, well drained soils that formed in residuum and colluvium

derived from volcanic rocks. These soils are on mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Bouncer gravelly loamy fine sand, 15 to 50 percent slopes, in a wooded area:

A1—0 to 1½ inches; brown (10YR 5/3) gravelly loamy fine sand, very dark grayish brown (10YR 3/2) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 45 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

A2—1½ to 3 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; strong thick and medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots; few very fine tubular and many very fine and fine vesicular pores; 20 percent pebbles; neutral (pH 7.0); clear smooth boundary.

Bt1—3 to 7 inches; brown (7.5YR 5/4) very gravelly loam, dark brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, sticky and slightly plastic; many very fine and fine roots; few very fine tubular and common very fine interstitial pores; 55 percent pebbles; common moderately thick clay films on faces of peds and bridging sand grains; neutral (pH 7.2); clear smooth boundary.

Bt2—7 to 10 inches; brown (7.5YR 5/4) extremely gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, sticky and slightly plastic; common very fine to medium roots; few very fine tubular and common very fine interstitial pores; 65 percent pebbles; common moderately thick clay films on faces of peds and bridging sand grains; neutral (pH 7.2); clear wavy boundary.

Cr—10 to 21 inches; highly weathered and fractured volcanic bedrock; roots in fractures.

R—21 inches; hard, fractured volcanic bedrock.

**Type location:** Mineral County, Nevada; approximately 2,000 feet north and 500 feet west of the southeast corner of sec. 13, T. 7 N., R. 29 E.; 38 degrees, 27 minutes, 0 seconds north latitude and 118 degrees, 41 minutes, 20 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative

between July and October due to convection storms

*Soil temperature:* 47 to 53 degrees F

*Solum thickness and depth to soft bedrock:* 8 to 14 inches

*Depth to hard bedrock:* 20 to 30 inches

*Control section:* Clay content—18 to 23 percent; content of rock fragments—35 to 60 percent, mainly pebbles

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

*B horizon:*

Hue—7.5YR or 10YR

Value—4 to 6 dry, 4 or 5 moist

Chroma—3 or 4

Clay content—18 to 25 percent

### **Brawley Series**

The Brawley series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from altered volcanic rocks with a component of volcanic ash. These soils are on hills and mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Mollic Palexeralfs

**Typical pedon:** Brawley very stony fine sandy loam, 15 to 50 percent slopes, in an area of woodland in the Wassit-Brawley association, where ½ inch of pine needle duff covers the surface and stones cover about 5 percent of the surface, cobbles about 10 percent, and pebbles about 20 percent:

A1—0 to 2 inches; grayish brown (10YR 5/2) very stony fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 20 percent pebbles, 10 percent cobbles; neutral (pH 7.0); abrupt smooth boundary.

A2—2 to 7 inches; light brownish gray (10YR 6/2) gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine to medium and few coarse roots; common very fine interstitial and tubular pores; 15 percent pebbles, 10 percent cobbles; neutral (pH 6.8); clear smooth boundary.

Bt1—7 to 13 inches; light yellowish brown (10YR 6/4)

very gravelly clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, friable, sticky and plastic; common fine to coarse roots; common very fine and fine tubular pores; 45 percent pebbles, 5 percent cobbles; common thick clay films on faces of peds and lining pores; neutral (pH 6.8); clear wavy boundary.

Bt2—13 to 27 inches; yellowish brown (10YR 5/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; very hard, firm, sticky and plastic; few fine roots; common very fine and fine tubular pores; 55 percent pebbles; many moderately thick and few thick clay films on faces of peds and lining pores; neutral (pH 7.0); gradual wavy boundary.

Cr—27 inches; weathered andesite; clay films extending into fractures.

**Type location:** Mineral County, Nevada; approximately 200 feet north and 200 feet east of the southwest corner of sec. 11, T. 10 N., R. 28 E.; 38 degrees, 42 minutes, 0 seconds north latitude and 118 degrees, 49 minutes, 40 seconds west longitude.

#### **Range in Characteristics**

*Soil moisture:* Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently July to October due to convection storms; dry throughout the profile of the control section for at least 45 consecutive days after the summer solstice

*Soil temperature:* 44 to 47 degrees F

*Solum thickness and depth to bedrock:* 20 to 30 inches

*Control section:* Clay content—35 to 50 percent; content of rock fragments—35 to 60 percent, mostly pebbles

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist; 3 moist in the upper part

Chroma—2 or 3 dry or moist

*Bt horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry

Chroma—3 or 4

Texture—clay loam, clay

Clay content—35 to 50 percent

Rock fragments—35 to 60 percent

### **Bregar Family**

The Bregar Family consists of shallow, well drained soils that formed in residuum, alluvium, and colluvium derived from andesitic rock sources. These soils are on

side slopes of hills and mountains and on pediments. Slopes are 2 to 8 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Xerollic Haplargids

**Reference pedon:** Bregar Family, very gravelly sand, in an area of rangeland where pebbles cover about 35 percent of the surface and cobbles cover about 15 percent:

- A—0 to 2 inches; light gray (10YR 7/2) very gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 35 percent pebbles, 15 percent cobbles; neutral (pH 6.6); abrupt smooth boundary.
- AB—2 to 5 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; common medium roots; common very fine and fine interstitial pores; 10 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.
- Bt—5 to 8 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; 55 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.
- R—8 inches; unweathered andesitic bedrock.

**Type location:** Mineral County, Nevada; approximately 35 miles south of Hawthorne; about 1,250 feet south and 1,250 feet west of the northeast corner of sec. 30, T. 4 N., R. 29 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-July to October

**Soil temperature:** 44 to 46 degrees F

**Depth to bedrock:** 8 to 16 inches

**Control section:** Content of rock fragments—35 to 50 percent; clay content—8 to 30 percent

**A horizon:**

Structure—single grained or massive

**Bt horizon:**

Texture—gravelly clay loam, very gravelly loam

Rock fragments—35 to 60 percent pebbles

Clay content—18 to 30 percent

### Breko Series

The Breko series consists of very deep, well drained

soils that formed in mixed alluvium. These soils are on fan piedmont remnants and inset fan remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Xerollic Haplargids

**Typical pedon:** Breko gravelly sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Breko-Crunker association:

- A1—0 to 3 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; many micro roots; many very fine and fine interstitial pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.
- A2—3 to 5 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; moderate thick platy structure; soft, very friable, slightly sticky and nonplastic; common medium and many very fine and fine roots; many fine interstitial and common very fine and fine vesicular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 7.9); clear wavy boundary.
- Bt1—5 to 11 inches; brown (7.5YR 5/4) very gravelly clay loam, brown (7.5YR 4/4) moist; strong fine and medium angular blocky structure; slightly hard, very friable, sticky and slightly plastic; many very fine and fine and common medium roots; many very fine and fine interstitial and common fine and very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 40 percent pebbles; slightly effervescent; moderately alkaline (pH 7.9); clear wavy boundary.
- Bt2—11 to 19 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; strong fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many fine and very fine tubular and common fine interstitial pores; few moderately thick clay films on faces of peds and lining pores; 60 percent pebbles; strongly effervescent; secondary calcium carbonate coating undersides of pebbles and fine filaments in old root channels; moderately alkaline (pH 8.0); gradual wavy boundary.
- Bk1—19 to 33 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine

and fine interstitial pores; 65 percent pebbles; calcium carbonate coating undersides of pebbles; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

**Bk2**—33 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 60 percent pebbles; pockets of very weak cementation, dominantly calcium carbonate with some silica; strongly effervescent; moderately alkaline (pH 8.0).

**Type location:** Mineral County, Nevada; approximately 1,420 feet east and 1,650 feet south of the northwest corner of sec. 31, T. 6 N., R. 34 E.; 38 degrees, 20 minutes, 24 seconds north latitude and 118 degrees, 14 minutes, 16 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 55 to 59 degrees F

**Control section:** Clay content—25 to 35 percent; content of rock fragments—35 to 60 percent, mainly pebbles

#### *A horizon:*

Value—5 to 7 dry, 4 to 6 moist

Chroma—2 or 3 dry or moist

Structure—platy, granular, or subangular blocky

Carbonates—noneffervescent or slightly effervescent

#### *Bt horizon:*

Hue—7.5YR or 5YR

Value—5 to 7 dry, 4 to 6 moist

Chroma—2 to 4 dry or moist

Texture of the fine earth fraction—clay loam, loam, or sandy clay loam

Clay content—25 to 35 percent

Rock fragments—35 to 60 percent, mostly pebbles; as much as 70 percent in some subhorizons

Structure—strong or weak subangular blocky

Reaction—moderately alkaline or strongly alkaline

Carbonates—slightly effervescent to strongly effervescent

#### *Bk horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Texture of the fine earth fraction—sandy loam or coarse sandy loam

Clay content—5 to 8 percent

Rock fragments—55 to 75 percent

Structure—massive or single grained

Reaction—moderately alkaline or strongly alkaline

Carbonates—strongly to violently effervescent

#### *Bqk horizon (if it occurs):*

Value—7 or 8 dry, 6 or 7 moist

Chroma—1 to 3 dry or moist

Texture of the fine earth fraction—coarse sandy loam or loamy sand

Rock fragments—60 to 75 percent, mostly pebbles

Reaction—strongly alkaline or very strongly alkaline

Cementation—weak continuous silica cementation of 30 to 50 percent durinodes in friable matrix

#### *B'k horizon (if it occurs):*

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 or 3 dry or moist

Texture of the fine earth fraction—sandy loam or coarse sandy loam

Rock fragments—65 to 80 percent, mostly pebbles

Carbonates—strongly to violently effervescent

### **Brier Series**

The Brier series consists of shallow, well drained soils that formed in residuum and colluvium derived from volcanic rocks. These soils are on mountain slopes and hills. Slopes are 15 to 75 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Argixerolls

**Typical pedon:** Brier very stony loam, 15 to 30 percent slopes, in an area of woodland in the Squawtip-Brier-Rock outcrop association, where pebbles cover about 25 percent of the surface, cobbles about 10 percent, and stones about 3 percent:

**A1**—0 to 2 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine vesicular and few very fine interstitial pores; 20 percent pebbles, 10 percent cobbles, 10 percent stones; neutral (pH 6.8); clear smooth boundary.

**A2**—2 to 7 inches; brown (10YR 5/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and

fine roots; common very fine tubular pores; 25 percent pebbles, 20 percent cobbles; neutral (pH 6.8); clear smooth boundary.

**Bt**—7 to 15 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine to medium roots; common very fine tubular pores; common moderately thick clay films on faces of peds; 20 percent pebbles, 20 percent cobbles; neutral (pH 7.2); abrupt wavy boundary.

**R**—15 inches; hard, fractured volcanic bedrock.

**Type location:** Mineral County, Nevada; approximately 800 feet south and 800 feet west of the northeast corner of sec. 4, T. 2 N., R. 34 E.; 38 degrees, 3 minutes, 49 seconds north latitude and 118 degrees, 11 minutes, 26 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and early spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 49 to 53 degrees F

**Thickness of the mollic epipedon:** 7 to 12 inches

**Depth to bedrock:** 14 to 20 inches

**Control section:** Clay content—18 to 35 percent; content of rock fragments—35 to 60 percent, mostly cobbles

**Reaction throughout the profile:** Neutral or mildly alkaline

#### A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3 dry or moist

Texture—loam or sandy loam

#### Bt horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry or moist

Texture—loam, clay loam, or sandy clay loam; more than 35 percent clay in some subhorizons

### Buckaroo Series

The Buckaroo series consists of very deep, well drained soils that formed in alluvium derived from mixed volcanic rocks. These soils are on summits of fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Typic Natrargids

**Typical pedon:** Buckaroo stony fine sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Buckaroo-Bluewing association, where pebbles cover about 45 percent of the surface, cobbles about 10 percent, and stones about 2 percent:

**A**—0 to 3 inches; pale brown (10YR 6/3) stony fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 35 percent pebbles, 5 percent cobbles, 2 percent stones; strongly alkaline (pH 8.6); abrupt smooth boundary.

**E**—3 to 4 inches; light gray (10YR 7/2) loam, grayish brown (10YR 5/2) moist; moderate medium platy structure; hard, very friable, slightly sticky and nonplastic; few very fine roots; many fine and medium vesicular pores; slightly effervescent; strongly alkaline (pH 8.9); abrupt smooth boundary.

**Btn**—4 to 8 inches; brown (10YR 4/3) clay loam, brown (10YR 4/3) moist; strong medium prismatic structure; very hard, friable, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; many moderately thick clay films on faces of peds; 10 percent pebbles; slightly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.

**Btnk**—8 to 18 inches; brown (7.5YR 4/4) clay loam, brown (7.5YR 4/4) moist; moderate medium prismatic structure; very hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; continuous moderately thick clay films on faces of peds; 10 percent pebbles; common fine lime in filaments or threads; strongly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.

**Bqk**—18 to 28 inches; light brown (7.5YR 6/4) gravelly loam, brown (7.5YR 5/4) moist; massive; hard, very friable, slightly sticky and nonplastic; few very fine roots; common very fine and fine tubular pores; 25 percent pebbles; 15 percent weak 2-centimeter durinodes; lime pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

**2Bk**—28 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 45 percent pebbles; lime pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.7).

**Type location:** Mineral County, Nevada; about 325 feet south and 2,100 feet east of the northwest corner of sec. 19, T. 14 N., R. 32 E.; 39 degrees, 4 minutes, 20 seconds north latitude and 118 degrees, 25 minutes, 1 second west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods during spring and winter

*Soil temperature:* 53 to 59 degrees F

*Depth to base of natric horizon:* 10 to 20 inches

*Control section:* Clay content—35 to 50 percent; content of rock fragments—0 to 10 percent, mainly pebbles; exchangeable sodium—35 to 80 percent

*Reaction throughout the profile:* Strongly alkaline or very strongly alkaline

#### A horizon:

Value—4 or 5 moist

Chroma—2 or 3

Carbonates—noneffervescent to strongly effervescent

Structure—weak or moderate thin or medium platy or subangular blocky

#### E horizon:

Chroma—2 or 3

Carbonates—slightly effervescent to violently effervescent

Structure—moderate or strong thin to thick platy

#### Btn horizon:

Hue—10YR or 7.5YR

Value—4 to 6 dry, 4 or 5 moist

Chroma—3 to 6

Texture—clay loam or clay

Carbonates—slightly effervescent to strongly effervescent in the upper part, strongly effervescent or violently effervescent in the lower part

#### Bk horizon:

Hue—10YR or 7.5YR

Value—6 or 7 dry, 5 or 6 moist

Chroma—2 to 4

Texture—sandy loam, fine sandy loam, or loam

Rock fragments—25 to 50 percent, mainly pebbles, content increasing with depth; as much as 60 percent in the lower subhorizon

Other features—commonly up to 15 percent durinodes in some subhorizons

### Budihol Series

The Budihol series consists of very shallow, well

drained soils that formed in granitic residuum and colluvium. These soils are on mountain peaks, hills, and side slopes. Slopes are 15 to 75 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy, mixed, nonacid, mesic, shallow Xeric Torriorthents

**Typical pedon:** Budihol extremely bouldery sandy loam, 50 to 75 percent slopes, in an area of rangeland in the Uripnes-Budihol-Rock outcrop association, where pebbles cover about 25 percent of the surface, stones about 15 percent, and boulders about 20 percent:

A1—0 to 2 inches; pale brown (10YR 6/3) extremely bouldery sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many fine and very fine interstitial pores; 20 percent boulders, 15 percent stones, 25 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

A2—2 to 10 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium and many fine and very fine roots; many fine and very fine interstitial pores; 20 percent pebbles, 5 percent cobbles; neutral (pH 7.3); clear irregular boundary.

Cr—10 to 21 inches; weathered granodiorite.

R—21 inches; hard granodiorite.

**Type location:** Mineral County, Nevada; approximately 200 feet east and 500 feet north of the southwest corner of sec. 37, T. 14 N., R. 32 E.; 39 degrees, 1 minute, 48 seconds north latitude and 118 degrees, 19 minutes, 24 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall

*Soil temperature:* 47 to 53 degrees F

*Thickness of the solum:* 6 to 14 inches

*Control section:* Texture—sandy loam or coarse sandy loam; clay content—12 to 18 percent; content of rock fragments—15 to 35 percent, dominantly pebbles 2 to 5 millimeters in diameter

*Depth to weathered bedrock:* 6 to 14 inches

*Depth to unweathered bedrock:* 20 to 30 inches

#### A horizon:

Value—3 or 4 moist

Chroma—2 or 3

## Bulake Family

The Bulake Family consists of shallow, well drained soils that formed in residuum derived from volcanic rocks. These soils are on side slopes of hills and mountains. Slopes are 8 to 50 percent. Mean annual precipitation is 12 to 16 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Mollic Haploxeralfs

**Reference pedon:** Bulake Family, gravelly loamy sand, in an area of rangeland where pebbles cover about 40 percent of the surface and cobbles cover 5 to 10 percent:

A—0 to 4 inches; pale brown (10YR 6/3) gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; single grained; loose, nonsticky and nonplastic; common fine and medium roots; many very fine interstitial pores; 25 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

Bt1—4 to 7 inches; yellowish brown (10YR 5/4) clay, brown and dark brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; hard, firm, very sticky and very plastic; few medium roots; common medium interstitial pores; 10 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

Bt2—7 to 12 inches; pinkish gray (7.5YR 6/2) clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; few medium roots; common medium interstitial pores; 15 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

Bt3—12 to 17 inches; pinkish gray (7.5YR 6/2) clay, brown and dark brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; few medium roots; few medium interstitial pores; 15 percent pebbles; neutral (pH 6.6); abrupt wavy boundary.

R—17 inches; unweathered andesitic bedrock.

**Type location:** Mineral County, Nevada; approximately 23 miles south of Hawthorne; about 2,600 feet south and 1,000 feet east of the northwest corner of sec. 11, T. 4 N., R. 30 E.

### Range in Characteristics

**Soil moisture:** Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile

for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 46 degrees F

**Depth to bedrock:** 9 to 20 inches

**Bt horizon:**

Clay content—40 to 50 percent

Rock fragments—5 to 15 percent pebbles

## Bylo Variant

The Bylo Variant consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on mountain-valley alluvial flats. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Typic Camborthids

**Typical pedon:** Bylo Variant very fine sandy loam, 0 to 2 percent slopes, in an area of rangeland:

A1—0 to 3 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; strong thick platy structure; slightly hard, very friable, nonsticky and slightly plastic; few micro roots; common medium and many very fine and fine vesicular pores; moderately alkaline (pH 8.0); clear smooth boundary.

A2—3 to 5 inches; light yellowish brown (10YR 6/4) silt loam, brown (10YR 4/3) moist; strong very thick platy structure parting to moderate thin platy; slightly hard, very friable, sticky and slightly plastic; common very fine and fine roots; common fine vesicular and common fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bw—5 to 15 inches; light yellowish brown (10YR 6/4) silt loam, brown (10YR 4/3) moist; strong thick platy structure parting to strong thin platy; slightly hard, very friable, sticky and plastic; common medium roots; few fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Ck—15 to 60 inches; pale brown (10YR 6/3) silt loam, dark yellowish brown (10YR 4/4) moist; strong thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; many fine lime filaments and threads; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; in Win Wan

Flat; about 1,760 feet west and 1,600 feet south of the northeast corner of sec. 5, T. 9 N., R. 33 E.; 38 degrees, 40 minutes, 22 seconds north latitude and 118 degrees, 19 minutes, 15 seconds west longitude.

#### Range in Characteristics

*Soil temperature:* 54 to 57 degrees F

*Control section:* Clay content—18 to 25 percent; silt content—65 to 70 percent; content of rock fragments—less than 5 percent

*Reaction throughout the profile:* Moderately alkaline to strongly alkaline

#### A horizon:

Chroma—3 or 4 dry or moist

Carbonates—noneffervescent or slightly effervescent

#### Bw horizon:

Chroma—3 or 4 dry or moist

Carbonates—noneffervescent or slightly effervescent

#### Ck horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4 dry or moist

Carbonates—strongly effervescent to violently effervescent

### Calpeak Series

The Calpeak series consists of very shallow, well drained soils that formed in residuum and colluvium derived from welded tuff. These soils are on hills and mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 8 to 12 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic, shallow Xeric Torriorthents

**Typical pedon:** Calpeak very gravelly sandy loam, 8 to 30 percent slopes, in an area of rangeland in the Calpeak-Lomoiné association, where pebbles cover about 30 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 45 percent pebbles; slightly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

A2—2 to 5 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate

medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine to coarse roots; common very fine and fine interstitial and few very fine tubular pores; 40 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr—5 inches; highly weathered tuff; roots and calcium carbonate in fractures.

**Type location:** Mineral County, Nevada; in the Gabbs Valley Range; approximately 200 feet south and 2,000 feet west of the northeast corner of sec. 25, T. 10 N., R. 33 E.; 40 degrees, 2 minutes, 3 seconds north latitude and 118 degrees, 14 minutes, 26 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 57 degrees F

*Depth to weathered bedrock:* 3 to 10 inches

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline

*Carbonates:* Slightly effervescent to violently effervescent throughout with some lime in fractures of bedrock; 5 percent calcium carbonate equivalent

*Control section:* Clay content—10 to 18 percent; content of coarse fragments—35 to 55 percent, predominantly pebbles 2 to 5 millimeters in diameter

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4 dry or moist

Structure—weak or moderate subangular blocky or platy

### Candelaria Series

The Candelaria series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on ballenas and fan piedmont remnants. Slopes are 2 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Calciorthids

**Typical pedon:** Candelaria very gravelly fine sandy loam, 4 to 30 percent slopes, in an area of rangeland in the Candelaria-Izo, rarely flooded, association, where stones cover about 1 percent of the surface, cobbles about 10 percent, and pebbles about 65 percent:

- A1—0 to 1 inch; light gray (10YR 7/2) very gravelly fine sandy loam, brown (10YR 5/3) moist; strong thick platy structure parting to strong medium platy; slightly hard, very friable, slightly sticky and nonplastic; many fine and medium vesicular pores; 50 percent pebbles, 10 percent cobbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- A2—1 to 4 inches; light gray (10YR 7/2) gravelly fine sandy loam, brown (10YR 5/3) moist; strong thick platy structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; many fine and medium vesicular pores; 15 percent pebbles; lime pendants on rock fragments; strongly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.
- Bk—4 to 10 inches; very pale brown (10YR 7/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; strong thin and medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine to medium roots; few very fine tubular and common very fine and fine interstitial pores; 30 percent pebbles; lime pendants on rock fragments; 15 percent plates weakly cemented with silica and lime; violently effervescent; strongly alkaline (pH 8.7); clear wavy boundary.
- 2Bkq—10 to 16 inches; very pale brown (10YR 7/3) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine to medium roots; common very fine to medium interstitial and few very fine tubular pores; 55 percent pebbles, 5 percent cobbles; 35 percent discontinuous plates strongly to weakly cemented with silica and lime; few gypsum coatings on bottoms of rock fragments; violently effervescent; strongly alkaline (pH 8.7); clear smooth boundary.
- 2B'k—16 to 38 inches; light gray (10YR 7/2) extremely gravelly loamy sand, yellowish brown (10YR 5/4) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine to medium interstitial pores; 65 percent pebbles, 10 percent cobbles; lime pendants on rock fragments; few gypsum coatings on bottoms of rock fragments; violently effervescent; strongly alkaline (pH 8.7); clear wavy boundary.
- 2C1—38 to 54 inches; light gray (10YR 7/2) extremely gravelly sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine to medium interstitial pores; 65 percent pebbles; lime pendants on rock

fragments; few gypsum coatings on bottoms of rock fragments; strongly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

- 2C2—54 to 60 inches; very pale brown (10YR 7/3) very gravelly loamy sand, yellowish brown (10YR 5/4) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine to medium interstitial pores; 50 percent pebbles, 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.7).

**Type location:** Mineral County, Nevada; approximately 2,500 feet west and 1,300 feet north of the southeast corner of sec. 12, T. 4 N., R. 35 E.; 38 degrees, 12 minutes, 48 seconds north latitude and 118 degrees, 1 minute, 50 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and spring and from 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Depth to calcic horizon:* 1 to 6 inches

*Reaction throughout the profile:* Strongly alkaline or very strongly alkaline

*Control section:* Clay content—4 to 10 percent; texture—sand, loamy sand, loamy coarse sand (sandy loam in the upper part of some pedons); content of rock fragments—50 to 70 percent, predominantly pebbles (40 to 80 percent in some strata of some pedons)

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Carbonates—noneffervescent to strongly effervescent

#### Bk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Carbonates—strongly effervescent or violently effervescent

#### Bkq horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture—loamy sand or sandy loam

Clay content—8 to 15 percent

Rock fragments—45 to 65 percent, predominantly pebbles

Calcium carbonate—10 to 25 percent

Other features—30 to 60 percent plates strongly to weakly cemented with silica and lime

**2B'k horizon:**

Value—6 or 7 dry, 4 or 5 moist  
 Chroma—3 or 4  
 Texture—sand, loamy sand, or loamy coarse sand  
 Rock fragments—50 to 75 percent, 40 to 80 percent  
 in some strata of some pedons; predominantly  
 pebbles  
 Structure—massive or single grained  
 Calcium carbonate—5 to 15 percent; strongly  
 effervescent or violently effervescent

**2C horizon:**

Value—6 or 7 dry, 4 or 5 moist  
 Chroma—3 or 4  
 Texture—sand, loamy sand, or loamy coarse sand  
 Rock fragments—50 to 70 percent  
 Calcium carbonate—less than 5 percent; strongly  
 effervescent or violently effervescent

**Celeton Series**

The Celeton series consists of very shallow, somewhat excessively drained soils that formed in residuum derived from diatomaceous earth. These soils are on hills. Slopes are 4 to 50 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents

**Typical pedon:** Celeton very gravelly loam, 4 to 30 percent slopes, in an area of rangeland in the Celeton-Dumps-Izo association:

A1—0 to 2 inches; white (10YR 8/2) very gravelly loam, light gray (10YR 7/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 45 percent hard pebbles, 40 percent soft platy diatomaceous fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C1—2 to 5 inches; white (10YR 8/2) gravelly sandy loam, light gray (10YR 7/2) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine and few fine interstitial pores; 15 percent hard pebbles, 75 percent soft diatomaceous platy fragments ½ to 1 inch in diameter; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr—5 to 60 inches; semiconsolidated diatomaceous earth.

**Type location:** Mineral County, Nevada; about 400 feet north and 400 feet east of the southwest corner of

sec. 20, T. 2 N., R. 34 E.; 38 degrees, 0 minutes, 34 seconds north latitude and 118 degrees, 13 minutes, 9 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring

**Soil temperature:** 53 to 57 degrees F

**Control section:** Clay content—5 to 15 percent; content of rock fragments—5 to 15 percent hard, 60 to 80 percent soft diatomaceous earth

**Depth to paralithic contact:** 4 to 14 inches

**Carbonates:** Slightly effervescent to strongly effervescent

**Reaction throughout the profile:** Mildly alkaline to strongly alkaline

**A horizon:**

Value—6 to 8 dry, 4 to 7 moist

Chroma—2 or 3

Structure—massive or subangular blocky

Consistence—soft to hard dry, very friable to firm moist

**C horizon:**

Value—7 or 8 dry

Chroma—0 to 2

Texture—sandy loam or loam

Rock fragments—5 to 20 percent

Structure—massive or subangular blocky

Other features—80 to 90 percent fragments of diatomaceous earth (60 to 80 percent soft and 5 to 20 percent hard)

**Chill Series**

The Chill series consists of very shallow, well drained soils that formed in residuum derived from granitic bedrock. These soils are on low hills and rock pediments. Slopes are 4 to 30 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Chill gravelly sandy loam, 8 to 30 percent slopes, in an area of rangeland in the Chill-Petspring association:

A1—0 to 1 inch; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial and few very fine tubular pores; 20

percent pebbles; neutral (pH 6.8); clear smooth boundary.

A2—1 to 4 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular and few very fine interstitial pores; 20 percent pebbles; neutral (pH 6.8); clear smooth boundary.

Bt—4 to 7 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine roots; common very fine tubular and few very fine interstitial pores; 15 percent pebbles; neutral (pH 6.8); clear wavy boundary.

Cr—7 inches; fractured, weathered granite.

**Type location:** Mineral County, Nevada; approximately 1,200 feet south and 2,400 feet east of the northwest corner of sec. 19, T. 9 N., R. 34 E.; 35 degrees, 2 minutes, 7 seconds north latitude and 118 degrees, 16 minutes, 22 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from June to November

*Soil temperature:* 50 to 56 degrees F

*Control section:* Clay content—18 to 27 percent; sand content—45 to 65 percent; content of rock fragments—15 to 35 percent, mainly fine pebbles

*Depth to paralithic contact:* 6 to 14 inches

*Reaction throughout the profile:* Neutral or mildly alkaline

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Rock fragments—0 to 30 percent, mainly fine pebbles

#### Bt horizon:

Hue—10YR or 7.5YR

Value—4 to 6 dry, 3 to 5 moist

Chroma—3 or 4

Clay content—25 to 35 percent

### Chuckridge Series

The Chuckridge series consists of very shallow, well drained soils that formed in mixed alluvium. They are on alluvial fan remnants and fan piedmont remnants.

Slopes are 2 to 15 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Chuckridge gravelly sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Chuckridge-Crunker association:

A—0 to 2 inches; pale brown (10YR 6/3) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; many micro roots; many very fine interstitial and common very fine tubular pores; 30 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bt—2 to 5 inches; pale brown (10YR 6/3) gravelly loam, dark brown or brown (10YR 4/3) moist; strong fine or medium subangular blocky structure parting to strong very fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine interstitial and common fine tubular pores; 20 percent pebbles; common moderately thick clay films coating pores; moderately alkaline (pH 8.0); clear smooth boundary.

Btqk—5 to 12 inches; pale brown (10YR 6/3) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine and fine interstitial and common fine tubular pores; 35 percent pebbles, 20 percent duripan fragments; common thin clay films coating pores and peds; strongly effervescent; pebbles coated with calcium carbonate; lime pendants on the undersides of pebbles; moderately alkaline (pH 8.4); clear wavy boundary.

Bqkm1—12 to 16 inches; white (10YR 8/2) indurated duripan with continuous 1/8-inch laminar plates; very pale brown (10YR 7/3) moist; 20 percent pebbles, 10 percent cobbles; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary.

Bqkm2—16 to 26 inches; light gray (10YR 7/2) strongly cemented duripan, pale brown (10YR 6/3) moist; 40 percent pebbles, 10 percent cobbles; violently effervescent; very strongly alkaline (pH 9.1); clear wavy boundary.

Bqk—26 to 60 inches; very pale brown (10YR 7/3) discontinuous very gravelly sandy loam strongly to weakly cemented with silica; yellowish brown (10YR

5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine interstitial pores; 45 percent pebbles, 10 percent cobbles; violently effervescent; very strongly alkaline (pH 9.1).

**Type location:** Mineral County, Nevada; about 1,320 feet east and 1,320 feet south of the northwest corner of sec. 31, T. 10 N., R. 33 E.; approximately 1,700 feet north on the fenceline road from the northernmost cattleguard west of Win Wan Flat; 38 degrees, 40 minutes, 56 seconds north latitude and 118 degrees, 20 minutes, 42 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to duripan:** 7 to 14 inches

**Reaction throughout the profile:** Mildly alkaline to strongly alkaline

**Control section:** Texture—gravelly loam or gravelly sandy clay loam; clay content—18 to 25 percent; content of rock fragments—15 to 35 percent, dominantly pebbles

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

#### B horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly loam, gravelly clay loam, or gravelly sandy clay loam

Clay content—25 to 35 percent

Rock fragments—15 to 35 percent, predominantly pebbles

Structure—strong or moderate subangular blocky

Carbonates—noneffervescent or slightly effervescent in the upper part of the solum; strongly effervescent or violently effervescent in the lower part

#### Bqkm horizon:

Value—7 or 8 dry, 5 to 7 moist

Chroma—2 or 3

Rock fragments—35 to 60 percent, predominantly pebbles; 10 to 30 percent cobbles in some pedons

Cementation—indurated duripan with 1/16- to 1/8-inch silica laminae; strongly cemented with discontinuous silica laminae coating and bridging rock fragments in the lower portion

#### Bqk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Texture—very gravelly loamy sand or very gravelly sandy loam

Clay content—8 to 18 percent

Rock fragments—35 to 60 percent, predominantly pebbles

Reaction—strongly alkaline or very strongly alkaline

Cementation—discontinuous strong and weak silica cementation with lime and silica pendants on the bottoms of rock fragments

### Cirac Series

The Cirac series consists of very deep, well drained soils that formed in mixed alluvium. These soils are on alluvial flats, fan skirts, and inset fans. Slopes are 0 to 4 percent. Mean annual precipitation is about 4 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Typic Torrifuvents

**Typical pedon:** Cirac fine sandy loam, 0 to 2 percent slopes, in an area of rangeland where pebbles cover about 15 percent of the surface:

A1—0 to 5 inches; light brownish gray (10YR 6/2) fine sandy loam, brown (10YR 5/3) moist; strong thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine and common medium vesicular pores; 10 percent pebbles; violently effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.

C1—5 to 25 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine interstitial pores; 20 percent pebbles; violently effervescent; very strongly alkaline (pH 9.2); clear wavy boundary.

C2—25 to 34 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine interstitial pores; less than 5 percent pebbles;

violently effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.

**C3**—34 to 60 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; less than 5 percent pebbles; violently effervescent; very strongly alkaline (pH 9.2).

**Type location:** Mineral County, Nevada; about 2,400 feet north and 2,000 feet east of the southwest corner of sec. 24, T. 7 N., R. 34 E.; 38 degrees, 21 minutes, 4 seconds north latitude and 118 degrees, 8 minutes, 42 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Content of rock fragments—0 to 15 percent, dominantly pebbles 2 to 4.6 millimeters in diameter, as much as 35 percent in any layer of the substratum; texture—sandy loam or loam (layers of sand to silt loam in the substratum), strata of fine sandy loam to silt loam; clay content—8 to 18 percent

**Reaction throughout the profile:** Strongly alkaline or very strongly alkaline

**Carbonates:** Slightly effervescent to violently effervescent

**Salts:** Generally greater than 16 millimhos

**Sodium absorption rate:** Greater than 13

**Organic matter content:** Irregular, decreasing with depth

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

#### C horizon:

Texture—stratified sand to silt loam

Rock fragments—0 to 15 percent; as much as 35 percent in some strata

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

### Clanalpine Family

The Clanalpine Family consists of deep and very deep, well drained soils that formed in andesitic rock sources. These soils are on mountain side slopes. Slopes are 15 to 50 percent. Mean annual precipitation

is about 12 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Reference pedon:** Clanalpine Family, very cobbly very fine sandy loam, in an area of rangeland where cobbles cover about 60 percent of the surface:

**A1**—0 to 3 inches; grayish brown (10YR 5/2) very cobbly very fine sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, friable, nonsticky and nonplastic; many very fine roots; many very fine and fine tubular and interstitial pores; 50 percent cobbles; slightly acid (pH 6.4); abrupt smooth boundary.

**A2**—3 to 8 inches; brown (10YR 5/3) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine and medium interstitial pores; 30 percent cobbles; slightly acid (pH 6.4); abrupt smooth boundary.

**Bt**—8 to 15 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, friable, sticky and plastic; common fine and medium roots; many fine and medium interstitial pores; common thin clay films as bridges; 10 percent pebbles, 35 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.

**C1**—15 to 30 inches; pale brown (10YR 6/3) extremely cobbly loam, dark brown (10YR 3/3) moist; massive; soft, friable, slightly sticky and slightly plastic; few fine and medium roots; common fine and medium interstitial pores; 70 percent cobbles; slightly acid (pH 6.4); clear smooth boundary.

**C2**—30 to 40 inches; very pale brown (10YR 7/3) extremely cobbly loam, dark brown and brown (10YR 4/3) moist; massive; soft, friable, slightly sticky and slightly plastic; few fine roots; common fine and medium interstitial pores; 70 percent cobbles; slightly acid (pH 6.4).

**Type location:** Mineral County, Nevada; approximately 27 miles southwest of Hawthorne; about 1,000 feet south and 800 feet west of the apparent northeast corner of sec. 1, T. 5 N., R. 27 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile

for at least 45 consecutive days after the summer solstice

*Soil temperature:* 44 to 46 degrees F

*Thickness of the mollic epipedon:* 8 to 14 inches

*Depth to bedrock:* 40 to 60 inches

**A horizon:**

Structure—subangular blocky or massive

Reaction—slightly acid

**B horizon:**

Clay content—27 to 35 percent

Rock fragments—35 to 40 percent cobbles, 10 to 20 percent pebbles

**C horizon:**

Rock fragments—65 to 75 percent cobbles

### **Cleaver Series**

The Cleaver series consists of shallow, well drained soils that formed in alluvium derived from basic igneous rocks. These soils are on ballenas and fan piedmonts. Slopes are 2 to 15 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Cleaver very gravelly sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Deefan-Cleaver-Bluewing association:

A1—0 to 1 inch; light brownish gray (10YR 6/2) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 60 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

E—1 to 2 inches; light gray (10YR 7/2) gravelly fine sandy loam, grayish brown (10YR 5/2) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

Bt1—2 to 5 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; strong very fine granular structure; soft, friable, sticky and plastic; many very fine roots; many very fine interstitial pores; 20 percent pebbles, 5 percent cobbles; many thin clay films coating faces of peds and lining pores; slightly

effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

Bt2—5 to 8 inches; yellowish brown (10YR 5/6) gravelly clay loam, dark yellowish brown (10YR 3/6) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine and common medium roots; many very fine tubular and interstitial pores; 15 percent pebbles; common moderately thick clay films coating faces of peds; many moderately thick clay films lining pores; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bt3—8 to 11 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; many very fine tubular and interstitial pores; 30 percent pebbles; few thin clay films lining pores and coating faces of peds; few thin lime pendants on pebbles; strongly effervescent in the lower part; moderately alkaline (pH 8.2); abrupt wavy boundary.

Bqkm1—11 to 18 inches; white (N 8/0) duripan with a continuous indurated laminar cap; indurated and strongly cemented in very thick plates; violently effervescent; clear wavy boundary.

Bqkm2—18 to 23 inches; white (N 8/0) duripan; strongly cemented; massive; violently effervescent; abrupt wavy boundary.

Bqk—23 to 60 inches; light gray (10YR 7/2) extremely gravelly coarse sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 60 percent pebbles, 10 percent cobbles; many thin lime and silica pendants and coatings on rock fragments; weakly cemented with silica and lime; violently effervescent; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; 100 feet east and 500 feet north of the southwest corner of sec. 19, T. 12 N., R. 27 E.; 38 degrees, 52 minutes, 58 seconds north latitude and 119 degrees, 1 minute, 3 seconds west longitude.

#### **Range in Characteristics**

*Soil moisture:* Usually dry from April to December; moist in some parts for short periods in winter and spring

*Soil temperature:* 54 to 59 degrees F

*Depth to hardpan:* 10 to 20 inches

*Control section:* Clay content—25 to 35 percent; content of rock fragments—15 to 35 percent, mainly pebbles

*Reaction throughout the profile:* Neutral; strongly alkaline and strongly calcareous in some pedons where recharge by dust has occurred

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist  
Chroma—1 to 3

*Bt horizon:*

Hue—10YR or 7.5YR  
Value—5 or 6 dry, 3 to 5 moist  
Chroma—3 to 6  
Texture—clay loam or clay in the upper part; sandy loam, fine sandy loam, loam, or clay loam in the lower part  
Rock fragments—10 to 25 percent, mainly pebbles  
Reaction—neutral to moderately alkaline  
Other features—transitional Bt horizons with textures of loam, sandy loam, or fine sandy loam in some pedons; up to 40 percent pebbles in the lower part of the Bt horizon in some pedons

### **Coutis Family**

The Coutis Family consists of moderately deep and deep, well drained soils that developed from granitic rock sources. These soils are on mountain side slopes. Slopes are 15 to 50 percent. Mean annual precipitation is about 18 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Coarse-loamy, mixed Pachic Cryoborolls

**Reference pedon:** Coutis Family, sandy loam, in an area of rangeland where pebbles cover about 10 percent of the surface:

- A1—0 to 6 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; slightly acid (pH 6.2); abrupt smooth boundary.
- A2—6 to 18 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; many very fine and medium roots; many very fine and fine interstitial pores; slightly acid (pH 6.4); abrupt smooth boundary.
- A3—18 to 29 inches; dark brown (10YR 4/3) sandy loam, very dark brown (10YR 2/2) moist; massive; soft, friable, nonsticky and nonplastic; few fine and medium roots; many very fine and fine interstitial

pores; slightly acid (pH 6.4); abrupt smooth boundary.

C1—29 to 33 inches; dark brown (10YR 4/3) very gravelly sandy loam, very dark brown (10YR 2/2) moist; massive; soft, friable, nonsticky and nonplastic; few fine and medium roots; many very fine and fine interstitial pores; 45 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

C2—33 to 43 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; common medium interstitial pores; 40 percent pebbles; neutral (pH 6.6); abrupt wavy boundary.

Cr—43 to 53 inches; white (2.5Y 8/2), weathered granitic bedrock, sandy loam in fractures; light gray (2.5Y 7/2) moist.

**Type location:** Mineral County, Nevada; approximately 18 miles south of Hawthorne; about 1,100 feet south and 800 feet west of the northeast corner of sec. 13, T. 5 N., R. 29 E.

#### **Range in Characteristics**

*Soil moisture:* Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

*Mean annual soil temperature:* 44 to 46 degrees F

*Mean summer soil temperature:* 56 to 58 degrees F

*Depth to weathered granitic bedrock:* 24 to 50 inches

*Control section:* Content of rock fragments—15 to 30 percent; clay content—5 to 18 percent

*C horizon:*

Rock fragments—30 to 50 percent pebbles

### **Crunker Series**

The Crunker series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on inset fans and fan aprons. Slopes are 2 to 15 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Durorthidic Xeric Torriorthents

**Typical pedon:** Crunker loamy sand, 2 to 4 percent slopes, in an area of rangeland in the Ratleflat-Crunker association:

A1—0 to 3 inches; pale brown (10YR 6/3) loamy sand,

dark yellowish brown (10YR 4/4) moist; weak thick platy structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial and few tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

A2—3 to 12 inches; pale brown (10YR 6/3) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine to medium roots; many very fine and fine interstitial pores; 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

Bk—12 to 20 inches; pale brown (10YR 6/3) very gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine and common medium roots; many very fine and fine interstitial pores; 35 percent pebbles with lime coating the undersides; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Bk—20 to 34 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine interstitial and few tubular pores; 45 percent pebbles with lime coatings and some bridging of sand grains; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

2Bqk—34 to 60 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many micro roots; common very fine and fine interstitial pores; 65 percent pebbles, 5 percent cobbles; 30 percent weak to strong discontinuous silica cementation; lime and silica pendants coating the bottoms of pebbles; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 700 feet south and 200 feet east of the northwest corner of sec. 2, T. 9 N., R. 32 E.; 38 degrees, 40 minutes, 25 seconds north latitude and 118 degrees, 23 minutes, 23 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 54 to 59 degrees F

**Depth to 2B horizon:** 15 to 30 inches

**Cementation:** Discontinuous weak to strong silica cementation below 30 inches with silica cementing and bridging sand grains; lime and silica pendants coating the bottoms of pebbles

**Control section:** Clay content—5 to 12 percent; content of rock fragments—35 to 60 percent, dominantly pebbles

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—platy, subangular blocky, or massive

**Bk horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—massive or single grained

Texture—stratified coarse sand, sand, or loamy sand

Rock fragments—35 to 50 percent

Reaction—moderately alkaline or strongly alkaline; slightly effervescent to strongly effervescent

**2B horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Texture—stratified loamy sand, sand, or sandy loam

Rock fragments—40 to 60 percent; 35 to 80 percent in some strata

Reaction—moderately alkaline to very strongly alkaline

### Crunkvar Series

The Crunkvar series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from predominantly granitic rocks. These soils are on mountain-valley alluvial fans. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Xeric Torriorthents

**Typical pedon:** Crunkvar gravelly loamy sand, 4 to 15 percent slopes, in an area of rangeland in the Crunkvar-Lazan association:

A1—0 to 6 inches; pale brown (10YR 6/3) gravelly loamy sand, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine and medium roots; many very fine and

fine interstitial pores; 20 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

A2—6 to 10 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common fine tubular and many very fine and fine interstitial pores; 25 percent pebbles; neutral (pH 6.6); clear smooth boundary.

C1—10 to 22 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine tubular and many very fine and fine interstitial pores; 35 percent pebbles; neutral (pH 6.6); gradual smooth boundary.

C2—22 to 52 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and fine interstitial and few tubular pores; 45 percent pebbles; neutral (pH 6.8); clear smooth boundary.

C3—52 to 56 inches; yellowish brown (10YR 5/4) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine and medium and few very fine roots; many very fine and fine interstitial pores; 40 percent pebbles; neutral (pH 7.0); clear smooth boundary.

C4—56 to 60 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine roots; many very fine and fine interstitial and few fine tubular pores; 30 percent pebbles; neutral (pH 7.0).

**Type location:** Mineral County, Nevada; approximately ½ mile north of Lucky Boy Road; about 1,200 feet south of the northwest corner of sec. 24, T. 7 N., R. 29 E.; 38 degrees, 27 minutes, 15 seconds north latitude and 118 degrees, 41 minutes, 12 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Control section:** Content of rock fragments—35 to 60 percent, mostly pebbles 2 to 5 millimeters in diameter; 25 to 60 percent in individual strata

#### A horizon:

Value—3 or 4 moist

Reaction—slightly acid or neutral

#### C horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry or moist

Texture—loamy coarse sand; strata of sand, loamy sand, or coarse sandy loam in some pedons

Rock fragments—35 to 60 percent; 25 to 60 percent in individual strata

### Cucamungo Variant

The Cucamungo Variant consists of moderately deep, well drained soils that formed in residuum and colluvium derived from granitic rock. These soils are on intermontane rock pediments. Slopes are 4 to 15 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Fine-loamy, mixed, frigid Typic Argixerolls

**Typical pedon:** Cucamungo Variant gravelly sandy loam, 4 to 15 percent slopes, in an area of rangeland:

A1—0 to 2 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure parting to weak fine and medium subangular blocky; soft, very friable, nonsticky and nonplastic; common micro and few very fine roots; many very fine and fine interstitial pores; 20 percent pebbles; neutral (pH 6.8); clear smooth boundary.

A2—2 to 7 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak medium platy structure parting to weak fine and medium subangular blocky; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine vesicular and common very fine and fine tubular pores; 15 percent pebbles; neutral (pH 7.0); clear smooth boundary.

Bt1—7 to 11 inches; grayish brown (10YR 5/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common coarse and medium roots; common fine and medium tubular and many very fine and fine interstitial pores; 20 percent pebbles; few thin clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

**Bt2**—11 to 21 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine to coarse roots; common fine and medium tubular and common fine interstitial pores; 25 percent pebbles; common thin clay films lining pores; neutral (pH 7.0); gradual smooth boundary.

**Cr**—21 inches; weathered granitic bedrock.

**Type location:** Mineral County, Nevada; about 800 feet east and 1,500 feet south of the northwest corner of sec. 19, T. 5 N., R. 32 E.; 38 degrees, 16 minutes, 43 seconds north latitude and 118 degrees, 28 minutes, 15 degrees west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist in winter and early summer, dry in summer and fall but moist intermittently due to convection storms; dry throughout the profile at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 47 degrees F

**Thickness of the mollic epipedon:** 7 to 10 inches; may include Bt1 horizon in some pedons

**Depth to soft bedrock:** 20 to 40 inches

**Control section:** Clay content—18 to 27 percent; content of rock fragments—15 to 30 percent, mostly pebbles 2 to 5 millimeters in diameter

**Reaction throughout the profile:** Neutral or mildly alkaline

**Bt horizon:**

Value—5 or 6 dry, 4 or 5 moist; 3 moist in the Bt1 horizon of some pedons

Chroma—2 to 4 dry or moist

Texture of the fraction less than 2 millimeters—sandy loam or sandy clay loam

Clay content—18 to 27 percent

Rock fragments—15 to 30 percent, mostly pebbles 2 to 5 millimeters in diameter

### Dakent Series

The Dakent series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources with a dominant limestone component. These soils are on fan piedmont remnants. Slopes are 4 to 15 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Durixerollic Calciorthids

**Typical pedon:** Dakent gravelly very fine sandy loam, 4

to 15 percent slopes, in an area of rangeland in the Dakent-Cruncker association:

**A1**—0 to 3 inches; light gray (10YR 7/2) gravelly very fine sandy loam, brown (10YR 5/3) moist; moderate thick platy structure parting to moderate thin and medium platy; slightly hard, very friable, slightly sticky and nonplastic; common very fine roots; many very fine and fine vesicular pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

**Bw**—3 to 11 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial and common fine tubular pores; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

**Bk**—11 to 24 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine and fine interstitial and common fine tubular pores; 65 percent pebbles; violently effervescent with disseminated lime in the matrix and lime pendants coating the undersides of pebbles; strongly alkaline (pH 8.6); clear smooth boundary.

**Bqk**—24 to 34 inches; light gray (10YR 7/2) extremely gravelly sandy loam, pale brown (10YR 6/3) moist; massive; extremely hard, very firm, nonsticky and nonplastic; common very fine roots; common fine and medium tubular pores; 70 percent pebbles, 5 percent cobbles; 25 percent silica cementation and 50 percent lime cementation throughout the matrix; violently effervescent; strongly alkaline (pH 9.0); gradual smooth boundary.

**2Bk1**—34 to 43 inches; pale brown (10YR 6/3) extremely gravelly coarse sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine roots; many fine and medium interstitial pores; 60 percent pebbles, 5 percent cobbles; violently effervescent with many medium lime filaments and soft lime masses; strongly alkaline (pH 8.6); clear smooth boundary.

**2Bk2**—43 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine tubular pores; 65 percent pebbles; violently effervescent with lime pendants coating the bottoms of pebbles; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 2,300 feet south and 400 feet west of the northeast corner of sec. 29, T. 10 N., R. 32 E.; 38 degrees, 41 minutes, 4 seconds north latitude and 118 degrees, 25 minutes, 44 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Dry in summer and fall, moist in late winter and spring and from 10 to 20 days between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to calcic horizon:** 10 to 25 inches

**Thickness of calcic horizon:** 12 to 26 inches

**Control section:** Texture of the fraction less than 2 millimeters—sandy loam or loam, with strata of coarse sand, sand, or loamy sand in the lower part of some pedons; clay content—8 to 18 percent; content of rock fragments—60 to 75 percent, dominantly pebbles

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Carbonates—slightly to strongly effervescent

#### Bw horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture of the fraction less than 2 millimeters—sandy loam or loam

Clay content—10 to 22 percent

Rock fragments—15 to 35 percent, predominantly pebbles

Structure—weak or moderate subangular blocky

Carbonates—slightly effervescent to strongly effervescent

Rock fragments—60 to 75 percent, predominantly pebbles

#### Bk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture of the fraction less than 2 millimeters—loam or sandy loam

Carbonates—violently effervescent, with lime and silica coating the bottoms of rock fragments; 25 to 35 percent calcium carbonate equivalent

#### Bqk horizon:

Value—6 or 7 dry, 5 or 6 moist

Chroma—2 or 3

Rock fragments—60 to 75 percent, predominantly pebbles

Cementation—20 to 30 percent strong discontinuous silica cementation and 40 to 65 percent lime cementation; 35 to 45 percent calcium carbonate equivalent

#### 2Bk horizon:

Texture of the fraction less than 2 millimeters—coarse sand, sand, loamy sand, or loamy coarse sand

Rock fragments—60 to 75 percent

Carbonates—10 to 20 percent calcium carbonate equivalent

### Dedmount Series

The Dedmount series consists of very deep, moderately well drained soils that formed in mixed alluvium. These soils are on lake plains. Slopes are 0 to 2 percent. Mean annual precipitation is 4 to 6 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Aquic Torriorthents

**Typical pedon:** Dedmount silty clay loam, 0 to 2 percent slopes, in an area of rangeland in the Dedmount-Slaw association:

A—0 to 2 inches; pale brown (10YR 6/3) silty clay loam, yellowish brown (10YR 5/4) moist; weak thick platy structure; hard, very friable, sticky and plastic; few medium and coarse roots; common fine vesicular and interstitial pores; violently effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

C1—2 to 10 inches; light yellowish brown (10YR 6/4) silty clay, yellowish brown (10YR 5/4) moist; moderate coarse prismatic structure; slightly hard, very friable, sticky and plastic; few fine to coarse roots; few fine and medium tubular pores; violently effervescent; very strongly alkaline (pH 9.6); clear smooth boundary.

C2—10 to 22 inches; light yellowish brown (10YR 6/4) silty clay, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common fine to coarse roots; common fine to coarse tubular pores; common white (10YR 8/2) salt crystals; violently effervescent; strongly alkaline (pH 9.0); clear smooth boundary.

C3—22 to 43 inches; light yellowish brown (10YR 6/4) silty clay, yellowish brown (10YR 5/4) moist; massive; hard, very friable, sticky and plastic; few fine roots; common fine and medium tubular pores;

violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

C4—43 to 66 inches; light yellowish brown (10YR 6/4) silty clay, yellowish brown (10YR 5/4) moist; few fine and medium faint very pale brown (10YR 7/3) mottles; massive; hard, very friable, sticky and plastic; few fine roots; common fine tubular pores; common large lime concretions; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Mineral County, Nevada; about 2,500 feet north and 1,750 feet west of mud windmill; about 400 feet south and 900 feet east of northwest corner of sec. 15, T. 12 N., R. 33 E.; 38 degrees, 54 minutes, 47 seconds north latitude and 118 degrees, 15 minutes, 17 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist for short periods during winter and early spring and from 10 to 20 days between July and October due to convection storms; saturated between depths of 4 and 5 feet for short periods in late winter

**Soil temperature:** 54 to 59 degrees F

**Carbonates:** Strongly effervescent or violently effervescent

**Control section:** Sodium adsorption ratio—30 to 50, usually decreasing with depth; clay content—35 to 45 percent; texture—silty clay loam or silty clay, less than 15 percent fine sand or coarser

#### A horizon:

Value—6 dry, 4 or 5 moist  
Chroma—3 or 4 dry or moist

#### C horizon:

Value—6 dry, 4 or 5 moist  
Chroma—3 or 4 dry or moist  
Reaction—strongly alkaline to very strongly alkaline

### Deefan Series

The Deefan series consists of well drained soils that are very shallow to a strongly cemented hardpan. These soils formed in alluvium derived from mixed rocks. They are on alluvial fan piedmonts and ballenas. Slopes are 2 to 8 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Haplic Durargids

**Typical pedon:** Deefan very gravelly fine sandy loam, 2 to 8 percent slopes, in an area of rangeland in the

Deefan-Cleaver-Bluewing association, where pebbles cover about 45 percent of the surface and cobbles cover about 5 percent:

A—0 to 3 inches; light gray (10YR 7/2) very gravelly fine sandy loam, brown (10YR 5/3) moist; strong thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 35 percent pebbles, 2 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bt1—3 to 5 inches; dark yellowish brown (10YR 4/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure parting to strong fine granular; slightly hard, friable, sticky and plastic; common very fine roots; many very fine interstitial pores; common thin clay films lining pores and coating faces of peds; 20 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary.

Bt2—5 to 10 inches; brown (10YR 4/3) gravelly clay, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, fine, and medium roots; many very fine tubular pores; common thin clay films lining pores and coating faces of peds; 15 percent pebbles; few soft lime masses in the lower part; moderately alkaline (pH 8.2); abrupt wavy boundary.

Bqkm—10 to 26 inches; white (10YR 8/1) strongly cemented duripan with discontinuous very thin laminae; few thin clay films coating fractured plates in the upper part; pan formed in thick plates; very hard, very firm; roots matted between plates; few krotovinas with gravelly loamy sand texture; clear wavy boundary.

2Bqk1—26 to 43 inches; light gray (10YR 7/2) stratified extremely gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; 50 percent pebbles, 10 percent cobbles; many moderately thick lime and silica pendants on rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

2Bqk2—43 to 52 inches; white (10YR 8/2) extremely gravelly sand, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 55 percent pebbles, 5 percent cobbles; many thick lime and silica pendants and

common moderately thick lime and silica coatings on rock fragments; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**2Bqk3**—52 to 60 inches; pale brown (10YR 6/3) extremely gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 60 percent pebbles; few discontinuous weakly cemented lenses; few thin lime and silica pendants on pebbles; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; about 1,400 feet north of Reese River Canyon Road on the power line road; approximately 700 feet west and 1,200 feet north of the southeast corner of sec. 31, T. 12 N., R. 27 E.; 38 degrees, 51 minutes, 22 seconds north latitude and 118 degrees, 59 minutes, 30 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist for short periods during spring and winter

**Soil temperature:** 53 to 59 degrees F

**Depth to duripan:** 8 to 14 inches

**Control section:** Clay content—35 to 50 percent; content of rock fragments—15 to 35 percent, mainly pebbles

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Reaction—moderately alkaline or strongly alkaline

#### Bt horizon:

Hue—10YR or 7.5YR

Value—4 or 5 dry or moist

Chroma—3 or 4

Clay content—40 to 55 percent

Rock fragments—15 to 35 percent, mainly pebbles

Structure—subangular blocky, prismatic, or granular

Reaction—mildly alkaline or moderately alkaline

Carbonates—in soft masses in the lower part of some pedons

#### Bqkm horizon:

Cementation—strongly cemented; extremely hard dry, very firm moist

Other features—discontinuous indurated laminae possible in pan

#### 2Bqk horizon:

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—stratified coarse sand to sandy loam; averages loamy sand or sand

Rock fragments—60 to 75 percent

Reaction—moderately alkaline or strongly alkaline

### Downeyville Series

The Downeyville series consists of very shallow, well drained soils that formed in residuum derived from andesite, rhyolite, and metavolcanic rock. These soils are on hills, mountain slopes, and pediments. Slopes are 8 to 50 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Haplargids

**Typical pedon:** Downeyville very gravelly sandy loam, 15 to 50 percent slopes, in an area of rangeland in the Blacktop-Downeyville-Rock outcrop association:

**A1**—0 to 2 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak thick platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine and fine interstitial and common fine vesicular pores; 60 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

**A2**—2 to 5 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; strong thick and medium platy structure; hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 25 percent pebbles, 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

**Bt2**—5 to 8 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 35 percent pebbles, 5 percent cobbles; common thin clay films coating faces of peds and pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

**Btk**—8 to 14 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, sticky and slightly plastic; common very fine and fine roots; common

very fine tubular pores; 50 percent pebbles, 5 percent cobbles; few thin clay films coating faces of pedis; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

R—14 inches; fractured andesite; few lime coatings in fractures; weathered in the upper 4 inches.

**Type location:** Mineral County, Nevada; about 2,200 feet west and 2,220 feet south of the northeast corner of sec. 16, T. 9 N., R. 31 E.; 38 degrees, 38 minutes, 8 seconds north latitude and 118 degrees, 31 minutes, 37 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Depth to bedrock:** 4 to 14 inches

**Control section:** Clay content—14 to 25 percent; content of rock fragments—35 to 60 percent

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Carbonates:** Carbonates and accessory silica in the form of pendants on the lower sides of pebbles in some pedons, none in others; slightly effervescent to violently effervescent in the Btk horizon

#### A horizon:

Hue—7.5YR or 10YR

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 or 3

Carbonates—noneffervescent to strongly effervescent

#### Bt horizon:

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—loam, fine sandy loam; silt loam subhorizons possible in some pedons

Clay content—18 to 27 percent

Rock fragments—5 to 20 percent cobbles and stones; 30 to 50 percent pebbles

Reaction—moderately alkaline or strongly alkaline

Carbonates—slightly effervescent to violently effervescent in the lower part

### Eaglepass Series

The Eaglepass series consists of very shallow, well drained soils that formed in residuum and colluvium

derived from limestone and dolomite. These soils are on mountain slopes and hills. Slopes are 30 to 75 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

**Typical pedon:** Eaglepass extremely stony loam, 30 to 75 percent slopes, in an area of rangeland in the Eaglepass-Rock outcrop complex, 30 to 75 percent slopes, where pebbles cover about 45 percent of the surface, cobbles about 15 percent, and stones about 15 percent:

A—0 to 1 inch; light brownish gray (10YR 6/2) extremely stony loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common fine interstitial pores; 45 percent pebbles, 15 percent cobbles, 15 percent stones; violently effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

C—1 to 5 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial pores; 50 percent pebbles, 15 percent cobbles; violently effervescent; strongly alkaline (pH 8.5); abrupt irregular boundary.

R—5 inches; hard, unweathered limestone.

**Type location:** Mineral County, Nevada; about 1,000 feet south and 800 feet west of the northeast corner of sec. 7, T. 8 N., R. 35 E.; 38 degrees, 34 minutes, 10 seconds north latitude and 118 degrees, 6 minutes, 38 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 50 to 53 degrees F

**Depth to bedrock:** 3 to 6 inches

**Control section:** Texture of the fraction less than 2 millimeters—loam, fine sandy loam, sandy loam; clay content—8 to 18 percent; content of rock fragments—60 to 75 percent (includes pebbles, cobbles, and stones)

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Carbonates:** Calcareous in all parts, violently effervescent; more than 40 percent calcium

carbonate equivalent in the fraction less than 20 millimeters

**A horizon:**

Value—5 to 7 dry, 3 to 5 moist  
Chroma—3 or 4

**C horizon:**

Value—6 or 7 dry, 4 or 5 moist  
Chroma—3 or 4  
Other features—lime pendants and coatings on rock fragments in most pedons

### **Eastgate Series**

The Eastgate series consists of very deep, well drained soils that formed from mixed alluvium and eolian deposits. These soils are on nearly level to gently sloping alluvial fans, fan skirts, and fan piedmonts, often with sand sheets. Slopes are 0 to 8 percent. Mean annual precipitation is about 4 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Typic Camborthids

**Typical pedon:** Eastgate gravelly loamy sand, 0 to 4 percent slopes, in an area of rangeland in the Luning-Eastgate association:

**A**—0 to 2 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; weak thick platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few fine vesicular and common fine interstitial pores; 20 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

**Bw**—2 to 14 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; few fine tubular and many fine interstitial pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

**Bk1**—14 to 31 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; many fine interstitial pores; 15 percent pebbles; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary.

**2Bk2**—31 to 40 inches; light gray (10YR 7/2) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; many fine

interstitial pores; 40 percent pebbles, 5 percent cobbles; common moderately thick lime pendants and common thin lime coatings on rock fragments; violently effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

**3Bk3**—40 to 60 inches; very pale brown (10YR 7/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable; few fine and medium roots; many fine interstitial pores; 35 percent pebbles, 5 percent cobbles; few thin lime coatings on rock fragments; violently effervescent; strongly alkaline (pH 8.5).

**Type location:** Mineral County, Nevada; about 650 feet east and 1,000 feet south of the northwest corner of sec. 16, T. 11 N., R. 34 E.; 38 degrees, 49 minutes, 33 seconds north latitude and 118 degrees, 9 minutes, 15 seconds west longitude.

#### **Range in Characteristics**

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms; dry in the lower part of the moisture control section

**Soil temperature:** 53 to 59 degrees F

**Depth to base of Bw horizon:** 14 to 20 inches

**Depth to 2C horizon:** 25 to 40 inches

**Control section:** Texture—loamy sand (mixed); content of rock fragments—15 to 35 percent pebbles (mixed)

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Rock fragments—5 to 50 percent pebbles

Structure—platy, subangular blocky, or massive

Reaction—moderately alkaline or strongly alkaline; slightly effervescent or strongly effervescent due to carbonate recharge

**Bw horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—sandy loam or gravelly sandy loam

Clay content—8 to 15 percent

Structure—prismatic or subangular blocky

Reaction—moderately alkaline or strongly alkaline; noneffervescent or strongly effervescent due to carbonate recharge

Rock fragments—5 to 20 percent pebbles

**Bk horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—loamy sand or gravelly loamy sand  
 Rock fragments—5 to 20 percent pebbles  
 Reaction—moderately alkaline or strongly alkaline;  
 strongly effervescent or violently effervescent

**2Bk horizon:**

Value—6 or 7 dry, 4 or 5 moist  
 Chroma—2 or 3  
 Texture—very gravelly loamy sand with thin strata  
 of very gravelly sandy loam in some pedons  
 Rock fragments—35 to 50 percent pebbles, 0 to 5  
 percent cobbles  
 Reaction—strongly alkaline or very strongly alkaline;  
 few to many lime pendants and coatings on  
 rock fragments (less than 5 percent by volume)

**Epvip Series**

The Epvip series consists of shallow, well drained soils that formed in residuum and colluvium derived from andesite and related volcanic rocks. These soils are on mountains and hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid, shallow Aridic Argixerolls

**Typical pedon:** Epvip gravelly sandy loam, 15 to 50 percent slopes, in an area of rangeland in the Epvip-Hiridge-Katyblay association, where pebbles cover about 15 percent of the surface and cobbles cover about 3 percent:

- A1—0 to 3 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial and few very fine tubular pores; 15 percent pebbles; neutral (pH 6.8); clear smooth boundary.
- A2—3 to 5 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular and few very fine interstitial pores; 15 percent pebbles; neutral (pH 6.8); clear wavy boundary.
- A3—5 to 8 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular and few

very fine interstitial pores; 25 percent pebbles; neutral (pH 6.8); clear irregular boundary.

- Bt1—8 to 11 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular and few very fine interstitial pores; 35 percent pebbles; common thin and few moderately thick clay films; neutral (pH 6.8); clear irregular boundary.
- Bt2—11 to 19 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 35 percent pebbles, 10 percent cobbles; many moderately thick clay films on faces of peds; neutral (pH 6.8); clear wavy boundary.
- Cr—19 to 30 inches; weathered, altered intermediate volcanic bedrock.
- R—30 inches; hard, fractured intermediate volcanic bedrock.

**Type location:** Mineral County, Nevada; approximately 2 miles south of Aurora, about 1,320 feet west and 660 feet south of the northeast corner of sec. 32, T. 5 N., R. 28 E.; 38 degrees, 25 minutes, 0 seconds north latitude and 118 degrees, 47 minutes, 39 seconds west longitude.

**Range in Characteristics**

- Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice
- Soil temperature:** 44 to 47 degrees F
- Thickness of the mollic epipedon:** 7 to 14 inches
- Depth to paralithic contact:** 14 to 20 inches
- Depth to hard bedrock:** 20 to 30 inches
- Control section:** Clay content—25 to 35 percent; texture of the fraction less than 2 millimeters—loam, clay loam, or sandy clay loam; content of rock fragments—35 to 50 percent, mainly pebbles (over 50 percent more than 5 millimeters in diameter)
- Reaction throughout the profile:** Slightly acid or neutral
- A horizon:**  
 Value—dominantly 5 dry, but may be 6 in the upper part of the A1 horizon  
 Chroma—2 or 3 dry or moist

**Bt horizon:**

Texture—loam, sandy clay loam, or clay loam

Clay content—25 to 35 percent

Rock fragments—35 to 50 percent, mainly pebbles (over 50 percent more than 5 millimeters in diameter)

**Fadoll Series**

The Fadoll series consists of very deep, well drained soils that formed in eolian volcanic ash and alluvium derived from mixed rock sources. These soils are on lake terraces and inset fans. Slopes are 0 to 4 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Ashy, nonacid, mesic Xeric Torriorthents

**Typical pedon:** Fadoll loamy sand, 0 to 4 percent slopes, in an area of rangeland:

**A1**—0 to 2 inches; light brownish gray (10YR 6/2) loamy sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 5 percent pebbles; neutral (pH 6.8); clear smooth boundary.

**A2**—2 to 10 inches; light brownish gray (10YR 6/2) loamy sand, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and medium roots; many very fine interstitial pores; 5 percent pebbles; neutral (pH 6.8); clear smooth boundary.

**Bq1**—10 to 21 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; very hard, friable, nonsticky and nonplastic; few very fine and fine roots; common very fine interstitial pores; 10 percent pebbles; 15 percent weakly cemented durinodes 1 to 3 centimeters in diameter; neutral (pH 6.8); gradual wavy boundary.

**Bq2**—21 to 35 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; very hard, friable, nonsticky and nonplastic; few very fine and fine roots; common very fine interstitial pores; 15 percent pebbles; 15 percent weakly cemented durinodes 1 to 3 centimeters in diameter; neutral (pH 6.8); gradual wavy boundary.

**2C**—35 to 60 inches; pale brown (10YR 6/3) very gravelly sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine

interstitial pores; 40 percent pebbles; neutral (pH 7.0).

**Type location:** Mineral County, Nevada; approximately 3 miles east of Larkin Lake; about 50 feet north and 1,000 feet west of the southeast corner of sec. 12, T. 4 N., R. 28 E.; 38 degrees, 12 minutes, 44 seconds north latitude and 118 degrees, 48 minutes, 7 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 47 to 52 degrees F

**Depth to Bq horizon:** 10 to 30 inches

**Depth to 2C horizon:** 30 to 40 inches

**Control section:** Clay content—less than 10 percent; texture—loamy sand or sand; content of rock fragments—0 to 15 percent in the upper part, 35 to 50 percent in the lower part

**Other features:** Fine sand and very fine sand fraction dominated by volcanic ash

**A horizon:**

Chroma—2 or 3 dry or moist

**Bq horizon:**

Value—5 to 7 dry, 4 to 6 moist

Chroma—2 or 3 dry or moist

Texture—loamy sand or sand

Clay content—less than 10 percent

Rock fragments—0 to 15 percent, dominantly pebbles

Consistence—very hard or hard dry, friable or very friable moist

Cementation—10 to 20 percent weak durinodes 1 to 4 centimeters in diameter

Other features—evidence of very weak silica cementation

**2C horizon:**

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Clay content—less than 5 percent

Rock fragments—35 to 50 percent, mainly pebbles

**Fallon Series**

The Fallon series consists of very deep, somewhat poorly drained soils that formed in alluvium derived from mixed rock sources. These soils are on stream and river terraces. Slopes are 0 to 2 percent. Mean annual

precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, nonacid, mesic Aquic Xerofluvents

**Typical pedon:** Fallon fine sandy loam, 0 to 2 percent slopes, in an area of rangeland in the Fallon-Fettic Variant-Fallon, saline-sodic, association:

A1—0 to 2 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

A2—2 to 8 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; many very fine and fine and common medium roots; many very fine and fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

2C1—8 to 18 inches; light brownish gray (2.5Y 6/2) fine sandy loam, very dark grayish brown (2.5Y 3/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2C2—18 to 22 inches; light brownish gray (2.5Y 6/2) very fine sandy loam, dark grayish brown (2.5Y 4/2) moist; many fine prominent yellowish brown (10YR 5/6 dry) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

3C3—22 to 28 inches; light brownish gray (2.5Y 6/2) loamy fine sand, dark grayish brown (2.5Y 4/2) moist; few fine prominent yellowish brown (10YR 5/6 dry) mottles; massive; slightly hard, very friable, nonsticky and nonplastic; few medium and common very fine and fine roots; common very fine and fine tubular pores; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

4C4—28 to 50 inches; grayish brown (2.5Y 5/2) fine sandy loam, very dark grayish brown (2.5Y 3/2) moist; few fine yellowish brown (10YR 5/6) mottles; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and fine interstitial

and tubular pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

5C5—50 to 60 inches; light brownish gray (2.5Y 6/2) sand, dark grayish brown (2.5Y 4/2) moist; common fine prominent yellowish brown (10YR 5/6 dry) mottles; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; approximately ¼ mile northeast of the Ninemile Ranch house; about 2,500 feet east and 300 feet south of the northwest corner of sec. 14, T. 6 N., R. 27 E.; 38 degrees, 23 minutes, 2 seconds north latitude and 118 degrees, 49 minutes, 33 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Saturated within 40 inches of the surface during the spring and summer unless drained

*Soil temperature:* 53 to 57 degrees F

*Depth to mottles:* 15 to 24 inches

*Control section:* Clay content—less than 18 percent

*Reaction throughout the profile:* Neutral to strongly alkaline

*Other features:* Few to many mottles with hue of 5YR, 7.5YR, or 10YR and chroma of 2 to 6

#### A horizon:

Hue—10YR or 2.5Y

Value—3 or 4 moist

Chroma—2 or 3 dry or moist

Structure—massive, subangular blocky, or platy

Reaction—neutral to strongly alkaline

#### C horizons:

Hue—10YR or 2.5Y

Value—3 to 5 moist, 5 to 7 dry

Chroma—2 or 3

Texture—stratified fine sandy loam to coarse sand with strata of loam or silt loam in some pedons (averages sandy loam or fine sandy loam); stratified clay to coarse sand below a depth of 40 inches

Rock fragments—up to 25 percent pebbles in strata of some pedons

Reaction—mildly alkaline or moderately alkaline

Other features—noneffervescent or violently effervescent

### Fawin Series

The Fawin series consists of very deep, well drained

soils that formed in sandy alluvium derived from mixed rock sources. These soils are on mountain-valley alluvial flats, fan skirts, and fan aprons. Slopes are 0 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Typic Camborthids

**Typical pedon:** Fawin fine sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Fawin-Crunker association:

- A1**—0 to 2 inches; light gray (10YR 7/2) loamy fine sand, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; very few micro roots; many very fine interstitial and few fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary.
- A2**—2 to 5 inches; light gray (10YR 7/2) fine sandy loam, brown (10YR 4/3) moist; weak thin and medium platy structure parting to weak fine subangular blocky; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine vesicular and common very fine and fine tubular pores; noneffervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- Bw**—5 to 11 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; many very fine and fine interstitial and common very fine and fine tubular pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- Bk1**—11 to 34 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial and common very fine and fine tubular pores; 10 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.
- 2Bk2**—34 to 60 inches; pale brown (10YR 6/3) gravelly coarse sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine roots; many fine and medium interstitial pores; 25 percent pebbles; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 900 feet north and 200 feet west of the southeast corner of sec. 35, T. 10 N., R. 32 E.; 38 degrees, 40 minutes, 52 seconds north latitude and 118 degrees, 22 minutes, 28 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture—averages sand or loamy sand; content of rock fragments—less than 15 percent, dominantly pebbles

**Depth to 2B horizon:** 25 to 40 inches

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

**Bw horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—fine sandy loam or sandy loam

Clay content—8 to 18 percent

Structure—weak or moderate subangular blocky

Carbonates—5 to 8 percent calcium carbonate equivalent, by weight; noneffervescent to strongly effervescent, increasing with depth

Reaction—mildly alkaline to strongly alkaline

Rock fragments—0 to 15 percent

**Bk horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—sand or loamy sand

Clay content—5 to 10 percent

Structure—massive or single grained

Carbonates—10 to 15 percent calcium carbonate equivalent, by weight; strongly effervescent or violently effervescent (lime coatings on the bottoms of pebbles)

Reaction—moderately alkaline or strongly alkaline

Rock fragments—0 to 15 percent

**2B horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture—gravelly coarse sand, gravelly loamy sand, or gravelly sand

Reaction—moderately alkaline or strongly alkaline

Carbonates—strongly effervescent or violently effervescent

Rock fragments—15 to 35 percent

### Fettic Variant

The Fettic Variant consists of very deep, somewhat poorly drained soils that formed in alluvium derived from

mixed rock sources. These soils are on stream terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Aridic Natrixerolls

**Typical pedon:** Fetic Variant fine sandy loam, 0 to 2 percent slopes, in an area of the Fallon-Fetic Variant-Fallon, saline-sodic, association:

A1—0 to 4 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; many very fine, fine, and medium roots; many very fine interstitial pores; neutral (pH 7.2); abrupt smooth boundary.

A2—4 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; moderately alkaline (pH 8.0); abrupt wavy boundary.

Btnk1—8 to 13 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium and coarse roots; many very fine and fine interstitial and tubular pores; slightly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

Btnk2—13 to 20 inches; light brownish gray (10YR 6/2) clay loam, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; few coarse and common fine and medium pores; lime disseminated throughout the lower part of the horizon; common prominent white (N 8/0) fine soft lime masses and filaments; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

2Bk—20 to 24 inches; pale brown (10YR 6/3) loamy sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine and medium roots; common fine tubular and interstitial pores; lime disseminated and in common prominent white (N 8/0) fine masses and filaments; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

3C1—24 to 28 inches; light brownish gray (2.5Y 6/2) silt loam, light olive brown (2.5Y 5/4) moist; few fine distinct brown (7.5YR 5/4) mottles; massive; slightly

hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common fine and medium tubular pores; strongly effervescent; very strongly alkaline (pH 9.4); abrupt smooth boundary.

4C2—28 to 60 inches; light brownish gray (2.5Y 6/2) stratified fine sandy loam with thin strata of clay loam, light olive brown (2.5Y 5/4) moist; many fine and medium prominent strong brown (7.5YR 5/6) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; many fine and medium tubular pores; slightly effervescent; very strongly alkaline (pH 9.6).

**Type location:** Mineral County, Nevada; approximately 1,000 feet northeast of the Ninemile Ranch house; about 2,000 feet east and 200 feet south of the northwest corner of sec. 14, T. 6 N., R. 27 E.; 38 degrees, 23 minutes, 8 seconds north latitude and 118 degrees, 56 minutes, 12 seconds west longitude.

#### Range in Characteristics

*Soil temperature:* 52 to 54 degrees F

*Thickness of the mollic epipedon:* 7 to 14 inches, including the Btnk1 horizon

*Control section:* Clay content—25 to 35 percent; content of rock fragments—less than 15 percent

*Depth to seasonal high water table:* 4 to 6 feet

*A horizon:*

Reaction—neutral to moderately alkaline

*Bt horizon:*

Texture—clay loam or loam

Clay content—25 to 35 percent

Rock fragments—less than 15 percent

Reaction—strongly alkaline or very strongly alkaline

Exchangeable sodium—30 to 60 percent

Carbonates—slightly effervescent to violently effervescent

*C horizon:*

Chroma—2 to 4 dry or moist

Texture—stratified loamy sandy to clay loam

Clay content—12 to 18 percent

Rock fragments—5 percent or less

Reaction—strongly alkaline or very strongly alkaline

Carbonates—slightly effervescent or strongly effervescent

#### Fulstone Series

The Fulstone series consists of shallow, well drained soils that formed in alluvium derived from mixed rocks.

These soils are on summits of very old fan piedmont remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Abruptic Xerollic Durargids

**Typical pedon:** Fulstone cobbly loam, 2 to 8 percent slopes, in an area of rangeland in the Fulstone-Mickey association:

- A1**—0 to 1 inch; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine interstitial pores; 10 percent pebbles, 35 percent cobbles; neutral (pH 6.8); abrupt smooth boundary.
- A2**—1 to 4 inches; grayish brown (10YR 5/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine interstitial pores; 25 percent pebbles, 5 percent cobbles; neutral (pH 7.0); abrupt smooth boundary.
- Bt1**—4 to 10 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine and few medium roots; common very fine tubular pores; common moderately thick clay films lining pores; few moderately thick clay films lining faces of peds; 5 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.
- Bt2**—10 to 15 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and medium and few coarse roots; many very fine and fine tubular pores; 5 percent pebbles, 5 percent cobbles; many moderately thick clay films on faces of peds and lining pores; slightly effervescent; neutral (pH 7.2); abrupt wavy boundary.
- Bqkm**—15 to 40 inches; white (10YR 8/2) indurated and strongly cemented duripan with a continuous indurated laminar cap; violently effervescent; clear wavy boundary.
- Bqk**—40 to 60 inches; pale brown (10YR 6/3) very cobbly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; many very fine interstitial pores; 35 percent pebbles, 20 percent cobbles, 5 percent stones; common thin

lime and silica pendants on rock fragments; slightly effervescent; strongly alkaline (pH 8.5).

**Type location:** Mineral County, Nevada; about 1,300 feet west and 600 feet south of the northeast corner of sec. 1, T. 6 N., R. 26 E.; 38 degrees, 24 minutes, 38 seconds north latitude and 119 degrees, 1 minute, 25 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and early fall

*Soil temperature:* 53 to 57 degrees F

*Depth to base of Bt horizon:* 14 to 20 inches

*Control section:* Clay content—45 to 60 percent

*Depth to indurated duripan:* 14 to 20 inches

*A horizon:*

Structure—granular or subangular blocky

*Bt2 horizon:*

Hue—7.5YR or 10YR

Chroma—2 to 4

Rock fragments—generally none; pebbles or cobbles in some pedons due to mixing by burrowing animals

*Bqkm horizon:*

Duripan—essentially continuously cemented, but broken in some places by burrowing animals

*Bqk horizon:*

Rock fragments—50 to 80 percent pebbles and cobbles

Other features—0 to 40 percent durinodes

#### Fusuvar Series

The Fusuvar series consists of shallow, well drained soils that formed in residuum and colluvium derived from granodiorite. These soils are on mountains. Slopes are 30 to 75 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy, mixed, shallow Typic Cryoborolls

**Typical pedon:** Fusuvar very bouldery sandy loam, 30 to 75 percent slopes, in an area of rangeland in the Snopoc-Rockabin-Fusuvar association, where pebbles cover about 20 percent of the surface, stones about 5 percent, and boulders about 5 percent:

- A1**—0 to 2 inches; grayish brown (10YR 5/2) very bouldery sandy loam, very dark brown (10YR 2/2)

moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 10 percent pebbles, 5 percent boulders; medium acid (pH 6.0); clear wavy boundary.

A2—2 to 7 inches; brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; few very fine interstitial and common very fine tubular pores; 30 percent pebbles; slightly acid (pH 6.3); clear wavy boundary.

Bw—7 to 14 inches; yellowish brown (10YR 5/4) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine and common medium roots; common very fine tubular pores; 25 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.

Cr—14 inches; weathered granitic bedrock.

**Type location:** Mineral County, Nevada; on Bald Mountain; about 2,300 feet east and 900 feet south of the northwest corner of sec. 27, T. 11 N., R. 28 E.; 38 degrees, 47 minutes, 39 seconds north latitude and 118 degrees, 50 minutes, 13 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 47 degrees F

**Average summer soil temperature:** 54 to 59 degrees F

**Thickness of the mollic epipedon:** 7 to 14 inches

**Depth to soft bedrock:** 10 to 20 inches

**Control section:** Clay content—10 to 18 percent; content of rock fragments—15 to 35 percent, mostly pebbles 2 to 5 millimeters in diameter

**Reaction throughout the profile:** Medium acid or slightly acid

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3 dry or moist

**Bw horizon:**

Value—4 or 5 dry, 3 or 4 moist

Chroma—3 or 4 dry or moist

### Gabbvally Series

The Gabbvally series consists of very shallow, well drained soils that formed in residuum and colluvium derived from volcanic rocks. These soils are on hills and mountains. Slopes are 15 to 75 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Gabbvally extremely stony loamy coarse sand, 50 to 75 percent slopes, in an area of rangeland in the Stewval, very steep-Stewval-Gabbvally association, where pebbles cover about 25 percent of the surface, cobbles about 20 percent, and stones about 15 percent:

A—0 to 2 inches; pale brown (10YR 6/3) extremely stony loamy coarse sand, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine interstitial and few very fine tubular pores; 25 percent pebbles, 20 percent cobbles, 15 percent stones; neutral (pH 7.2); clear smooth boundary.

Bt1—2 to 4 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, sticky and slightly plastic; common very fine roots; common very fine tubular and few very fine interstitial pores; 45 percent pebbles, 5 percent cobbles; common thin clay films on faces of peds; neutral (pH 7.2); clear smooth boundary.

Bt2—4 to 8 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine roots; common very fine tubular and few very fine interstitial pores; 45 percent pebbles, 5 percent cobbles; common thin and few moderately thick clay films on faces of peds; mildly alkaline (pH 7.4); abrupt irregular boundary.

R—8 inches; hard, fractured rhyolitic tuff; lime and few roots in fractures.

**Type location:** Mineral County, Nevada; in the Gabbs Valley range; approximately 800 feet north and 400 feet west of the southeast corner of sec. 23, T. 10 N., R. 33 E.; 38 degrees, 42 minutes, 39 seconds north latitude and 118 degrees, 15 minutes, 27 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture of the fraction less than 2 millimeters—loam or sandy loam; clay content—15 to 25 percent; content of rock fragments—35 to 50 percent, predominantly pebbles

**Depth to bedrock:** 6 to 14 inches

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry or moist

Structure—weak subangular blocky or platy

Reaction—neutral or mildly alkaline

#### Bt horizon:

Clay content—18 to 27 percent

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry or moist

Texture of the fraction less than 2 millimeters—sandy clay loam, loam, or sandy loam

Rock fragments—35 to 50 percent

Structure—subangular blocky

Reaction—neutral or mildly alkaline

## Garhill Series

The Garhill series consists of very shallow, well drained soils that formed in residuum derived from basalt bedrock and eolian material. These soils are on hills and mesas. Slopes are 2 to 30 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durorthids

**Typical pedon:** Garhill very stony loamy fine sand, 4 to 15 percent slopes, in an area of rangeland in the Garhill-Blacktop association, where pebbles cover about 30 percent of the surface, cobbles about 15 percent, and stones about 7 percent:

**A1**—0 to 1 inch; pale brown (10YR 6/3) very stony loamy fine sand, dark brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 25 percent pebbles, 15 percent cobbles, 7 percent stones; moderately alkaline (pH 8.2); clear wavy boundary.

**A2**—1 to 5 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable,

slightly sticky and nonplastic; common very fine and fine roots; common fine vesicular and common very fine interstitial pores; 10 percent pebbles; moderately alkaline (pH 8.2); clear wavy boundary.

**Bk**—5 to 9 inches; light yellowish brown (10YR 6/4) gravelly loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine and fine and few medium roots; common fine tubular and common very fine and fine interstitial pores; 20 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**2Bqkm**—9 to 23 inches; white (10YR 8/1) indurated duripan, very pale brown (10YR 7/3) moist; massive; extremely hard, extremely firm; 1/4- to 1/2-inch continuous laminar cap alternating with strongly cemented lime and silica; violently effervescent; strongly alkaline (pH 8.8); abrupt irregular boundary.

**R**—23 inches; hard, fractured basalt bedrock; duripan protruding downward into the fractures

**Type location:** Mineral County, Nevada; approximately 1,550 feet north and 450 feet east of the southwest corner of sec. 33, T. 8 N., R. 32 E.; 38 degrees, 30 minutes, 31 seconds north latitude and 118 degrees, 25 minutes, 43 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 56 to 59 degrees F

**Control section:** Clay content—10 to 18 percent; content of rock fragments—15 to 25 percent

**Depth to duripan:** 7 to 14 inches

**Depth to bedrock:** 12 to 30 inches

**Other features:** Pan fragments and lime accumulation common in subhorizons directly above the duripan in most pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Carbonates—noneffervescent to violently effervescent

Structure—subangular blocky, platy, or single grained

#### Bk horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Texture—loam or sandy loam  
 Clay content—18 to 25 percent  
 Rock fragments—15 to 35 percent, mainly pebbles  
 Structure—weak subangular blocky or platy  
 Reaction—moderately alkaline or strongly alkaline  
 Carbonates—violently effervescent

**Bqkm horizon:**

Value—7 or 8 dry, 5 to 7 moist  
 Chroma—1 or 2 dry, 3 or 4 moist  
 Structure—platy or massive  
 Other features— $\frac{1}{8}$ - to  $\frac{3}{4}$ -inch continuous laminar cap; strongly cemented, somewhat fractured indurated duripan with pockets of weakly cemented material

**Geer Series**

The Geer series consists of very deep, well drained soils that formed in alluvium derived from mixed sources with a component of glass and other pyroclastic material. These soils are on fan skirts and inset fans. Slopes are 0 to 4 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Geer fine sandy loam, 2 to 4 percent slopes, in an area of rangeland in the Geer-Veet association:

A1—0 to 2 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

A2—2 to 10 inches; light gray (10YR 7/2) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.

C1—10 to 40 inches; light gray (10YR 7/2) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial pores; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.

C2—40 to 60 inches; light gray (10YR 7/2) very fine

sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial pores; violently effervescent; strongly alkaline (pH 8.5).

**Type location:** Mineral County, Nevada; about 1,580 feet east and 2,365 feet north of the southwest corner of sec. 13, T. 8 N., R. 36 E.; 38 degrees, 33 minutes, 7 seconds north latitude and 117 degrees, 55 minutes, 30 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture—dominantly loam or very fine sandy loam, but includes thin horizons of fine sandy loam, sandy loam, and silt loam; clay content—less than 18 percent

**Other features:** Averages 15 to 30 percent fine sand or coarser; mineralogy influenced by volcanic ash, glass, and other pyroclastic material; gravelly layers below a depth of 40 inches in some pedons

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline

**A horizon:**

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—platy, massive, or subangular blocky

Carbonates—slightly effervescent to strongly effervescent

**C horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Carbonates—strongly effervescent or violently effervescent; some fine or medium lime segregations in strata below a depth of 20 inches in some pedons

Chroma—2 to 4

**Goldyke Series**

The Goldyke series consists of shallow, well drained soils that formed in residuum and colluvium derived from rhyolite and rhyolite tuffs. These soils are on hills and rock pediments. Slopes are 2 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents

**Typical pedon:** Goldyke gravelly sandy loam, 8 to 30 percent slopes, in an area of rangeland in the Goldyke-Blacktop-Koyen association:

A—0 to 3 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; many very fine interstitial pores; few very fine and fine roots; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

C—3 to 9 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine interstitial pores; common very fine and fine roots; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Cr—9 to 27 inches; highly fractured rhyolite; few fine roots in fractures.

R—27 inches; hard rhyolite.

**Type location:** Mineral County, Nevada; about 1,500 feet north and 300 feet west of the southeast corner of sec. 12, T. 11 N., R. 31 E.; 38 degrees, 58 minutes, 13 seconds north latitude and 118 degrees, 25 minutes, 35 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during the winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—10 to 18 percent; content of rock fragments—15 to 35 percent pebbles

**Depth to paralithic contact:** 2 to 10 inches

**Depth to hard bedrock:** 20 to 40 inches

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Rock fragments—20 to 35 percent pebbles

Carbonates—slightly effervescent to strongly effervescent

#### C horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture—sandy loam or fine sandy loam

Rock fragments—15 to 35 percent pebbles

Carbonates—slightly effervescent to strongly effervescent

#### Cr horizon:

Color—highly variable; ranges from white or gray to brown, red, green, or violet

Weathering—in Cr horizons, ranges from highly weathered material to hard, highly fractured bedrock that can be dug out with a spade

### Granmount Series

The Granmount series consists of very deep, well drained soils that formed in residuum and colluvium derived from andesite and related rocks. These soils are on mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Clayey-skeletal, mixed Argic Cryoborolls

**Typical pedon:** Granmount very gravelly fine sandy loam, 30 to 50 percent slopes, in an area of rangeland in the Granmount-Kiote-Hiridge association:

A1—0 to 4 inches; grayish brown (10YR 5/2) very gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak thin and medium platy structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine and fine interstitial pores; 40 percent pebbles, 15 percent cobbles; neutral (pH 7.0); clear smooth boundary.

A2—4 to 10 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine and fine interstitial pores; 40 percent pebbles, 15 percent cobbles; neutral (pH 7.0); clear wavy boundary.

Bt1—10 to 23 inches; yellowish brown (10YR 5/4) extremely gravelly clay, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; hard, friable, very sticky and plastic; common very fine and fine and few medium roots; few fine interstitial and common fine tubular pores; 60 percent pebbles, 10 percent cobbles; many thick pressure faces on faces of peds and many thick clay films lining pores; neutral (pH 7.2); gradual smooth boundary.

Bt2—23 to 33 inches; yellowish brown (10YR 5/4) extremely gravelly clay, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure;

hard, friable, sticky and plastic; few very fine and fine roots; common fine tubular pores; 45 percent pebbles, 15 percent cobbles; many thick pressure faces on faces of peds and many thick clay films in pores; neutral (pH 7.2); clear smooth boundary.

**Bt3**—33 to 62 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; common fine tubular pores; 25 percent pebbles, 30 percent cobbles; many moderately thick clay films coating faces of peds and pores; neutral (pH 7.2).

**Type location:** Mineral County, Nevada; on the western slope of Mount Grant; about 1,435 feet north and 1,845 feet east of the southwest corner of sec. 13, T. 8 N., R. 28 E.; 38 degrees, 32 minutes, 56 seconds north latitude and 118 degrees, 48 minutes, 25 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist in winter, spring, and early summer, moist intermittently during summer and fall due to convection storms; dry in all parts of the profile in the moisture control section for at least 45 consecutive days after the summer solstice

**Mean annual soil temperature:** 44 to 47 degrees F

**Mean summer soil temperature:** 53 to 59 degrees F

**Thickness of the mollic epipedon:** 10 to 15 inches

**Control section:** Clay content—35 to 45 percent (20 percent increase within 7.5 centimeters of upper boundary); content of rock fragments—45 to 70 percent

#### A horizon:

Hue—10YR or 7.5YR

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3 dry or moist

Structure—weak or moderate platy or moderate subangular blocky

Reaction—slightly acid or neutral

#### Bt horizons:

Hue—10YR or 7.5YR

Value—4 or 5 dry or moist

Chroma—3 or 4 dry or moist

Texture—clay loam or clay

Clay content—35 to 50 percent

Rock fragments—45 to 70 percent

### Gynelle Series

The Gynelle series consists of very deep, somewhat

excessively drained soils that formed in mixed alluvium. These soils are on inset fans, fan skirts, and alluvial fans. Slopes are 0 to 15 percent. Mean annual precipitation is about 4 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Gynelle very gravelly loamy sand, 2 to 8 percent slopes, in an area of rangeland in the Oricto-Gynelle-Izo association:

**A**—0 to 3 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common fine interstitial pores; 35 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary.

**C**—3 to 9 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few fine tubular and interstitial pores; 45 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary.

**Ck**—9 to 16 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; few fine tubular and interstitial pores; 50 percent pebbles, 10 percent cobbles; thin lime pendants on rock fragments; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

**2C1**—16 to 19 inches; very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots; few fine tubular pores; 35 percent pebbles, 10 percent cobbles; strongly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.

**3C2**—19 to 60 inches; very pale brown (10YR 7/3) stratified very gravelly loamy sand to cobbly coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few fine tubular and interstitial pores; 35 percent pebbles, 15 percent cobbles; strongly effervescent; strongly alkaline (pH 8.5).

**Type location:** Mineral County, Nevada; about 600 feet south and 500 feet east of the northwest corner of sec. 3, T. 12 N., R. 32 E.; 38 degrees, 56 minutes, 28 seconds north latitude and 118 degrees, 21 minutes, 9 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms; dry in the lower part of the moisture control section

**Soil temperature:** 55 to 59 degrees F

**Control section:** Texture of the fraction less than 2 millimeters—stratified sand, loamy sand, and coarse sand with a subhorizon of sandy loam (averages loamy coarse sand, coarse sand, or loamy sand); content of rock fragments—35 to 60 percent

**Carbonates:** Slightly effervescent to violently effervescent

**Reaction throughout the profile:** Moderately alkaline to very strongly alkaline

**Depth to 2Bk horizon:** 4 to 14 inches

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Other features—thin horizon (3 inches thick) of gravelly sandy loam or sandy clay loam in some pedons

#### B and C horizons:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Rock fragments—35 to 60 percent, mostly gravel; as much as 80 percent (40 percent cobbles and stones) in some strata

Salinity—4 to 8 millimhos/centimeter

Structure—massive or weak subangular blocky

Other features—horizons stratified; lime pendants in one or more horizons in most pedons; lime-coated pebbles in some horizons in some pedons

### Haar Series

The Haar series consists of very shallow, well drained soils that formed in residuum derived from Tertiary sediments. These soils are on eroded side slopes of dissected pediments. Slopes are 8 to 50 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy, mixed, nonacid, mesic, shallow Xeric Torriorthents

**Typical pedon:** Haar gravelly loam, 30 to 50 percent slopes, in an area of rangeland in the Ravenell-Haar-Rock outcrop association:

A—0 to 2 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common medium and fine interstitial pores; 15 percent pebbles and 55 percent soft mudstone, sandstone, and other sedimentary rock fragments; neutral (pH 6.8); abrupt smooth boundary.

C—2 to 6 inches; light gray (10YR 7/2) loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common fine and medium tubular pores; 50 percent soft sedimentary rock fragments, mainly the size of gravel; neutral (pH 6.8); abrupt irregular boundary.

Cr—6 inches; weathered stratified mudstone and sandstone; few fine roots in fractures and between strata.

**Type location:** Mineral County, Nevada; about 1,800 feet east and 2,000 feet north of the southwest corner of sec. 31, T. 8 N., R. 28 E.; 38 degrees, 30 minutes, 27 seconds north latitude and 118 degrees, 53 minutes, 48 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist from late fall to early spring

**Soil temperature:** 52 to 57 degrees F

**Control section:** Texture—sandy loam, loam, or silt loam; clay content—10 to 18 percent; content of rock fragments—50 to 90 percent soft mudstone, siltstone, and sandstone the size of pebbles (most slake in water or crush easily when wet)

**Depth to paralithic contact:** 4 to 10 inches

**Reaction throughout the profile:** Neutral to moderately alkaline

#### A horizon:

Hue—2.5Y or 10YR

Value—6 to 8 dry, 3 to 6 moist

Chroma—2 or 3

Structure—granular or platy

Rock fragments—up to 30 percent hard rock fragments from higher geologic formations

#### C horizon (if it occurs):

Hue—2.5Y or 10YR

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 or 3

Structure—massive or subangular blocky

**Haarvar Series**

The Haarvar series consists of shallow, well drained soils that formed in residuum derived from Tertiary sedimentary rock. These soils are on rock pediment remnants and hills. Slopes are 4 to 30 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Clayey, montmorillonitic (calcareous), mesic, shallow Xeric Torriorthents

**Typical pedon:** Haarvar gravelly clay loam, 4 to 30 percent slopes, in an area of rangeland in the Haarvar-Wrango association, where pebbles cover about 20 percent of the surface:

A—0 to 1 inch; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, very sticky and very plastic; few fine and medium roots; common very fine and fine interstitial and few fine tubular pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

C1—1 to 4 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, very sticky and very plastic; common fine and few medium roots; few very fine interstitial and few fine tubular pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

C2—4 to 14 inches; pale yellow (5Y 7/4) clay, pale olive (5Y 6/4) moist; massive; hard, very firm, very sticky and very plastic; many fine and few medium roots; few very fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Cr—14 inches; Tertiary sedimentary bedrock.

**Type location:** Mineral County, Nevada; about 500 feet west and 2,000 feet north of the southeast corner of sec. 15, T. 7 N., R. 36 E.; 38 degrees, 27 minutes, 45 seconds north latitude and 117 degrees, 59 minutes, 57 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to soft bedrock:** 10 to 20 inches

**Control section:** Clay content—40 to 55 percent; content of rock fragments—5 to 10 percent

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

**Carbonates:** Slightly effervescent to strongly effervescent

**A horizon:**

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

**C horizon:**

Hue—10YR, 2.5Y, or 5Y

Value—6 or 7 dry, 5 or 6 moist

Chroma—3 to 6 dry or moist

Clay content—40 to 55 percent

Rock fragments—0 to 10 percent

**Handpah Series**

The Handpah series consists of shallow, well drained soils that formed in mixed alluvium derived dominantly from volcanic rocks. These soils are on alluvial fan remnants and fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Handpah very gravelly sandy loam, 8 to 15 percent slopes, in an area of rangeland in the Handpah-Breko-Crunker association:

A1—0 to 1 inch; pale brown (10YR 6/3) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine micro roots; many very fine and fine vesicular pores; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary.

A2—1 to 3 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; strong thick platy structure; slightly hard, very friable, nonsticky and nonplastic; many fine and medium roots; common fine vesicular and many very fine and fine interstitial pores; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary.

Bt1—3 to 6 inches; yellowish brown (10YR 5/4) gravelly loam, yellowish brown (10YR 5/4) moist; moderate medium platy structure parting to moderate medium subangular blocky; slightly hard, very friable, sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine tubular and common fine interstitial pores; few thin clay films on faces of peds and lining pores; 20 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary.

**Bt2**—6 to 11 inches; yellowish brown (10YR 5/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; strong fine subangular blocky structure; hard, friable, very sticky and very plastic; common very fine, fine, and medium roots; common fine interstitial and tubular pores; many moderately thick clay films on faces of peds and lining pores; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear wavy boundary.

**Bt3**—11 to 15 inches; yellowish brown (10YR 5/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate medium prismatic structure parting to strong fine and medium subangular blocky; hard, very friable, very sticky and very plastic; common very fine and fine roots; common fine interstitial and tubular pores; 15 percent pebbles; many thick clay films on faces of peds and lining pores; pockets of silica in the form of thin plates, silica coatings on the bottoms of rock fragments; mildly alkaline (pH 7.4); abrupt wavy boundary.

**Bqkm1**—15 to 24 inches; indurated duripan; continuous indurated laminar cap 2 to 5 millimeters thick over a continuous duripan strongly cemented with silica and lime; violently effervescent.

**Bqkm2**—24 to 60 inches; duripan strongly cemented with silica and lime; massive; very hard, brittle.

**Type location:** Mineral County, Nevada; about 2,495 feet south and 125 feet west of the northeast corner of sec. 6, T. 5 N., R. 33 E.; 38 degrees, 19 minutes, 21 seconds north latitude and 118 degrees, 20 minutes, 36 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, mostly dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 54 degrees F

**Control section:** Clay content—25 to 35 percent; texture—loam, clay loam, or sandy clay loam, with thin clay loam or clay layers in all pedons; content of rock fragments—15 to 30 percent

**Depth to hardpan:** 14 to 20 inches

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Reaction—mildly alkaline or moderately alkaline

Structure—single grained, platy, or subangular blocky

Carbonates—noneffervescent or slightly effervescent

#### Bt horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Reaction—mildly alkaline or strongly alkaline

Carbonates—noneffervescent or slightly effervescent; strongly effervescent in the lower part in some pedons

#### Bqkm horizon:

Thickness—weakly cemented layers within the strongly cemented mass in some pedons

Other features—duripan fractured but still in place

### Hapgood Family

The Hapgood Family consists of deep, well drained soils that formed in residuum derived from andesitic rock. These soils are on mountain side slopes. Slopes are 4 to 15 percent. Mean annual precipitation is about 18 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Pachic Cryoborolls

**Reference pedon:** Hapgood Family, very cobbly sandy loam, in an area of rangeland where cobbles cover about 60 percent of the surface:

**A1**—0 to 5 inches; brown (10YR 5/3) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; very soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and medium interstitial pores; 50 percent cobbles; slightly acid (pH 6.4); abrupt smooth boundary.

**A2**—5 to 14 inches; brown (10YR 5/3) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; very soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many medium interstitial pores; 50 percent cobbles; slightly acid (pH 6.4); abrupt smooth boundary.

**C1**—14 to 28 inches; brown (10YR 5/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; very soft, very friable, nonsticky and nonplastic; common very fine roots; common medium interstitial pores; 50 percent cobbles; slightly acid (pH 6.4); abrupt smooth boundary.

**C2**—28 to 40 inches; pale brown (10YR 6/3) very cobbly sandy loam, dark brown and brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly

plastic; few fine roots; common medium interstitial pores; 50 percent cobbles; slightly acid (pH 6.4); abrupt smooth boundary.

**Type location:** Mineral County, Nevada; approximately 17 miles south of Hawthorne; about 1,500 feet south and 600 feet west of the northeast corner of sec. 13, T. 5 N., R. 29 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

*Mean annual soil temperature:* 44 to 46 degrees F

*Mean summer soil temperature:* 56 to 58 degrees F

*Thickness of the mollic epipedon:* 20 to 30 inches

*Depth to bedrock:* 40 to 60 inches

*Control section:* Content of rock fragments—35 to 50 percent cobbles; clay content—10 to 20 percent

#### Hawsley Series

The Hawsley series consists of very deep, somewhat excessively drained soils that formed in alluvium and water-reworked eolian deposits derived from mixed rocks. These soils are on sand sheets. Slopes are 0 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is 52 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Hawsley loamy sand, 2 to 4 percent slopes, in an area of rangeland in the Isolde-Hawsley association:

A—0 to 3 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 5 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary.

C—3 to 36 inches; pale brown (10YR 6/3) sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine, fine, and medium roots; many very fine interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary.

Ck—36 to 60 inches; pale brown (10YR 6/3) sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine, fine, and medium roots; many very fine interstitial pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; about 500 feet north and 500 feet east of the southwest corner of sec. 19, T. 13 N., R. 34 E.; 38 degrees, 58 minutes, 43 seconds north latitude and 118 degrees, 11 minutes, 47 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods during winter and spring

*Soil temperature:* 53 to 57 degrees F

*Control section:* Texture—stratified fine sand to coarse sand, commonly sand (mixed) but fine sand in some pedons, thin strata of loamy fine sand in some pedons; content of rock fragments—0 to 15 percent pebbles

*A horizon:*

Hue—10YR or 2.5Y

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3

Reaction—neutral to moderately alkaline

*C horizons:*

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Reaction—commonly moderately alkaline or strongly alkaline, but mildly alkaline in the upper part in some pedons

Carbonates—slightly effervescent to violently effervescent in some subhorizons

Other features—strata with relict iron oxide stains with hue of 7.5YR in some pedons

#### Hiridge Series

The Hiridge series consists of shallow, well drained soils that formed in residuum and colluvium derived from altered andesite. These soils are on mountains. Slopes are 8 to 50 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, shallow Argic Cryoborolls

**Typical pedon:** Hiridge very gravelly sandy loam, 15 to 50 percent slopes, in an area of rangeland in the Granmount-Kiote-Hiridge association, where pebbles cover about 50 percent of the surface, cobbles about 5 percent, and stones about 2 percent:

A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly sandy loam, dark brown (10YR 3/3) moist;

weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine roots; many very fine and fine interstitial pores; 40 percent pebbles; neutral (pH 7.2); clear smooth boundary.

A2—2 to 4 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine and fine interstitial and common fine vesicular pores; 25 percent pebbles; neutral (pH 7.2); clear smooth boundary.

Bt1—4 to 9 inches; brown (10YR 4/3) very gravelly clay loam, dark brown (10YR 3/3) moist; strong fine subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine and common medium roots; common fine interstitial and common very fine and fine tubular pores; few thin clay films lining pores and on faces of peds; 45 percent pebbles; neutral (pH 7.2); clear wavy boundary.

Bt2—9 to 18 inches; dark yellowish brown (10YR 4/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; strong fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and medium roots; common fine interstitial and common very fine and fine tubular pores; common moderately thick clay skins lining pores and on faces of peds; 50 percent pebbles; neutral (pH 7.2); clear wavy boundary.

Cr—18 to 23 inches; highly weathered andesite bedrock; some clay and roots in fractures.

R—23 inches; hard, fractured andesite bedrock.

**Type location:** Mineral County, Nevada; on the western slope of Mount Grant; about 1,025 feet north and 1,845 feet east of the southwest corner of sec. 13, R. 28 E., T. 8 N.; 38 degrees, 32 minutes, 52 seconds north latitude and 118 degrees, 48 minutes, 21 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Mean annual soil temperature:** 43 to 47 degrees F

**Mean summer soil temperature:** 53 to 57 degrees F

**Control section:** Texture—loam or clay loam; clay content—25 to 35 percent; content of rock fragments—35 to 60 percent

**Reaction throughout the profile:** Neutral or mildly alkaline

**Depth to soft bedrock:** 14 to 20 inches

**Depth to hard bedrock:** 21 to 30 inches

**Thickness of the mollic epipedon:** 7 to 13 inches

**A horizon:**

Value—4 or 5 dry, 3 moist

Chroma—2 or 3

**B horizon:**

Value—4 or 5 dry, 3 moist (4 moist in the lower part in some pedons)

Chroma—3 or 4

Clay content—25 to 35 percent

Rock fragments—35 to 60 percent

#### Hottle Variant

The Hottle Variant consists of deep, well drained soils that formed in a mixture of eolian material and alluvium high in volcanic ash with minor additions of alluvium derived from basalt. These soils are in interplateau basins. Slopes are 2 to 8 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, frigid Aridic Duric Haploxerolls

**Typical pedon:** Hottle Variant sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Mopana-Hottle Variant association:

A1—0 to 2 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine interstitial and few very fine tubular pores; 10 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

Bw—2 to 13 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine to medium roots; common very fine tubular pores; 5 percent pebbles; neutral (pH 6.8); clear smooth boundary.

Bq1—13 to 39 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; massive; very hard, firm, nonsticky and nonplastic; few very fine to medium roots; few very fine tubular pores; 5 percent pebbles; 30 percent weak discontinuous silica cementation; 20 percent weak 1/2- to 1-inch durinodes; mildly alkaline (pH 7.4); clear smooth boundary.

Bq2—39 to 50 inches; pale brown (10YR 6/3) sandy

loam, brown (10YR 5/3) moist; massive; very hard, firm, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 10 percent pebbles; 30 percent weak discontinuous silica cementation; 25 percent durinodes ½ to 1 inch in diameter strongly cemented with silica; mildly alkaline (pH 7.7); clear wavy boundary.

**Bqm**—50 to 60 inches; duripan strongly cemented with silica; massive; very hard, very firm.

**Type location:** Mineral County, Nevada; about 500 feet south and 300 feet west of the northeast corner of sec. 31, T. 2 N., R. 32 E.; 38 degrees, 59 minutes, 30 seconds north latitude and 118 degrees, 25 minutes, 38 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 47 degrees F

**Thickness of the mollic epipedon:** 10 to 15 inches

**Depth to Bq horizon:** 10 to 30 inches

**Control section:** Clay content—10 to 18 percent; content of rock fragments—0 to 15 percent

**Depth to duripan:** 40 to 60 inches; no strongly cemented duripan in some pedons

#### A horizon:

Chroma—2 or 3 dry or moist

Reaction—slightly acid or neutral

#### Bq horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Clay content—10 to 18 percent

Rock fragments—0 to 15 percent

Reaction—neutral or mildly alkaline

Cementation—weak discontinuous silica cementation with or without durinodes ½ to 1 inch in diameter that are weakly to strongly cemented with silica

### Inmo Series

The Inmo series consists of very deep, excessively drained soils that formed in alluvium derived from mixed rocks, predominantly from granite, gneiss, quartzite, slate, and some limestone. These soils are on alluvial fans, fan skirts, and fan piedmonts. Slopes are 0 to 15 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Inmo extremely stony sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Inmo-Rednik association:

**A1**—0 to 2 inches; light brownish gray (2.5Y 6/2) extremely stony sandy loam, dark grayish brown (2.5Y 4/2) moist; strong thick platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine tubular and interstitial pores; 45 percent pebbles, 15 percent cobbles, 15 percent stones; slightly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

**A2**—2 to 6 inches; light brownish gray (2.5Y 6/2) very gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine tubular and interstitial pores; 45 percent pebbles, 15 percent cobbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

**C1**—6 to 12 inches; light gray (2.5Y 7/2) very gravelly loamy coarse sand, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine tubular and vesicular pores; 55 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

**C2**—12 to 16 inches; light brownish gray (2.5Y 6/2) very gravelly loamy coarse sand, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; many very fine interstitial pores; 55 percent pebbles, 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

**C3**—16 to 37 inches; light gray (2.5Y 7/2) very gravelly loamy coarse sand, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

**2C4**—37 to 54 inches; light gray (2.5Y 7/2) very gravelly loamy coarse sand, grayish brown (2.5Y 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 40 percent pebbles, 5 percent cobbles, 5 percent stones; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

**3C5**—54 to 60 inches; light brownish gray (2.5Y 6/2)

very gravelly loamy coarse sand, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 35 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; about 600 feet west of U.S. Highway 95; approximately 1,700 feet south and 900 feet east of the northwest corner of sec. 29, T. 10 N., R. 29 E.; 38 degrees, 42 minutes, 0 seconds north latitude and 118 degrees, 46 minutes, 18 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods in late winter and early spring

*Soil temperature:* 54 to 59 degrees F

*Control section:* Content of rock fragments—50 to 75 percent pebbles, mostly 2 to 5 millimeters in diameter

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

#### A1 horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Structure—platy or subangular blocky

#### C horizon:

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 to 4 dry or moist

Texture—coarse sand, sand, loamy coarse sand, or loamy sand

### Isolde Series

The Isolde series consists of very deep, excessively drained soils that formed in eolian sand derived from mixed rock sources. These soils are on semistabilized dunes over lakebeds, playas, terraces, alluvial fans, and hilly uplands. Slopes are 2 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Isolde fine sand, warm, 4 to 15 percent slopes, in an area of rangeland in the Wabuska-Isolde association:

A—0 to 4 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many

very fine and fine interstitial pores; moderately alkaline (pH 8.4); abrupt smooth boundary.

C—4 to 60 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; 2,000 feet north and 100 feet west of the southeast corner of sec. 36, T. 13 N., R. 33 E.; 38 degrees, 56 minutes, 54 seconds north latitude and 118 degrees, 12 minutes, 6 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods during winter and spring

*Soil temperature:* 53 to 57 degrees F

*Control section:* Texture—commonly fine sand; sand in some pedons, with 50 to 80 percent passing the number 40 sieve and 1 to 10 percent passing the number 200 sieve

*Reaction throughout the profile:* Neutral to moderately alkaline

#### A horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 or 3

#### C horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Other features—a 2C horizon below a depth of 40 inches in some pedons; moderately to strongly alkaline and noneffervescent to strongly effervescent in the lower C horizon in some pedons

### Itca Series

The Itca series consists of shallow, well drained soils that formed in residuum derived from extrusive volcanic and pyroclastic rocks. These soils are on mountains and side slopes of plateaus. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls

**Typical pedon:** Itca extremely stony loam, 30 to 50 percent slopes, in an area of woodland in the

Borealis-Itca association, where cobbles cover about 30 percent of the surface and stones cover about 25 percent:

- A1—0 to 2 inches; grayish brown (10YR 5/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial and few very fine tubular pores; 30 percent pebbles, 25 percent stones; neutral (pH 6.6); clear smooth boundary.
- A2—2 to 5 inches; grayish brown (10YR 5/2) very stony sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common fine and many very fine and fine roots; common very fine interstitial and few very fine tubular pores; 15 percent pebbles, 25 percent stones; neutral (pH 6.8); abrupt wavy boundary.
- Bt1—5 to 8 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to strong medium subangular blocky; slightly hard, very friable, sticky and plastic; common very fine to coarse roots; common very fine tubular pores; 35 percent pebbles, 15 percent cobbles; common moderately thick and few thin clay films on faces of peds; neutral (pH 6.8); clear wavy boundary.
- Bt2—8 to 18 inches; light yellowish brown (10YR 6/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to strong medium angular blocky; hard, friable, very sticky and very plastic; common very fine to coarse roots; common very fine tubular pores; many thick pressure faces; 35 percent pebbles, 15 percent cobbles; neutral (pH 6.8); abrupt wavy boundary.
- R—18 inches; hard, fractured basalt; discontinuous silica cementation.

**Type location:** Mineral County, Nevada; approximately 2,200 feet north and 400 feet east of the southwest corner of sec. 24, T. 2 N., R. 32 E.; 38 degrees, 0 minutes, 47 seconds north latitude and 118 degrees, 22 minutes, 45 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry for 60 to 90 consecutive days between July and October

*Soil temperature:* 43 to 47 degrees F; greater than 41 degrees F, May to November

*Thickness of the mollic epipedon:* 7 to 15 inches; may include the upper Bt horizon

*Depth to bedrock:* 10 to 20 inches

#### A horizon:

Hue—10YR or 7.5YR

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—weak or moderate medium to thick platy or subangular blocky

Consistence—soft or slightly hard dry, very friable or friable moist, nonsticky to slightly sticky and slightly plastic to plastic wet

Reaction—neutral or mildly alkaline

#### Bt horizons:

Hue—7.5YR or 10YR

Value—4 to 6 dry, 3 or 4 moist

Chroma—2 to 4

Texture—clay or clay loam

Clay content—35 to 45 percent

Rock fragments—35 to 50 percent, mainly pebbles (averaged); as much as 85 percent in some subhorizons

Consistence—slightly hard or hard dry, friable or firm moist, sticky or very sticky wet

Reaction—neutral to moderately alkaline

Other features—thin BC or C horizons comprised primarily of very soft decomposing rock in some pedons; tongues of material from Bt horizon extending into the bedrock fractures in the shallower pedons

### Itme Series

The Itme series consists of very deep, excessively drained soils that formed in alluvium derived dominantly from granitic or welded tuff rock sources. These soils are on alluvial fans, fan aprons, inset fans, and fan collars. Slopes are 0 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Itme very gravelly sand, 2 to 8 percent slopes, in an area of rangeland in the Itme-Truhoy association, where pebbles cover about 60 percent of the surface:

A1—0 to 6 inches; pale brown (10YR 6/3) very gravelly sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and common fine roots; many very fine interstitial pores; 55 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary.

C1—6 to 15 inches; pale brown (10YR 6/3) very

gravelly sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and common fine roots; many very fine interstitial pores; 50 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

**C2**—15 to 60 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and common fine roots; many very fine interstitial pores; 50 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 1.5 miles southeast of Eastside Mine; about 800 feet north and 2,500 feet east of the southwest corner of sec. 33, T. 3 N., R. 33 E.; 38 degrees, 4 minutes, 15 seconds north latitude and 118 degrees, 19 minutes, 0 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Reaction throughout the profile:** Mildly alkaline or strongly alkaline

**Control section:** Texture of the fraction less than 2 millimeters—loamy sand or sand; clay content—0 to 8 percent; content of rock fragments—35 to 60 percent (mostly pebbles), with more than 50 percent of the rock fragments 2 to 5 millimeters in size

#### A horizon:

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 or 3

Carbonates—noneffervescent or slightly effervescent

#### C horizon:

Value—5 to 7 dry, 4 or 5 moist

Chroma—3 or 4

Carbonates—slightly effervescent to violently effervescent

### Izo Series

The Izo series consists of very deep, excessively drained soils that formed in alluvium derived from mixed igneous and sedimentary rock. These soils are in channels and on fan aprons, fan skirts, inset fans, and alluvial fans. Slopes are 2 to 15 percent. Mean annual

precipitation is about 4 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Izo extremely gravelly loamy sand, 4 to 8 percent slopes, in an area of rangeland in the Gynelle-Izo association:

**A**—0 to 3 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 70 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

**C1**—3 to 7 inches; light gray (10YR 7/2) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 80 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

**2C2**—7 to 15 inches; light gray (10YR 7/2) very gravelly coarse sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 55 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

**3C3**—15 to 60 inches; light gray (10YR 7/2) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 75 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 2,500 feet south and 2,000 feet west of the northeast corner of sec. 28, T. 9 N., R. 31 E.; 38 degrees, 36 minutes, 51 seconds north latitude and 118 degrees, 31 minutes, 45 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods in winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture of the fraction less than 2 millimeters—stratified coarse sand, loamy sand, and loamy coarse sand; content of rock fragments—50 to 75 percent, mainly pebbles

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline, commonly increasing with depth

**Carbonates:** Slightly effervescent to strongly effervescent; noncalcareous in individual thin strata in some pedons

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4

Structure—platy, massive, or single grained

**C horizon:**

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—massive or single grained

Texture—sand, coarse sand, loamy sand, or loamy coarse sand, commonly stratified

Rock fragments—50 to 75 percent, predominantly pebbles; 15 to 85 percent in individual strata in some pedons

Segregated lime—as much as 50 percent of the undersides of rock fragments covered with thin lime coatings in any subhorizon

### **Jenness Family**

The Jenness Family consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on alluvial fans, in broad drainageways, and on terraces. Slopes are 0 to 4 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, nonacid, mesic Xeric Torriorthents

**Reference pedon:** Jenness Family, sandy loam, in an area of rangeland:

A1—0 to 3 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; neutral (pH 6.6); abrupt smooth boundary.

A2—3 to 13 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; neutral (pH 6.6); abrupt smooth boundary.

A3—13 to 22 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; neutral (pH 6.8); clear smooth boundary.

C1—22 to 37 inches; pale brown (10YR 6/3) sandy

loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; neutral (pH 6.8); clear smooth boundary.

C2—37 to 50 inches; brown (10YR 5/3) loamy very fine sand, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; many very fine interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

C3—50 to 60 inches; brown (10YR 5/3) loamy very fine sand, dark brown (10YR 3/3) moist; massive; very soft, very friable, nonsticky and nonplastic; many very fine interstitial pores; neutral (pH 6.8).

**Type location:** Mineral County, Nevada; approximately 26 miles south of Hawthorne; about 1 mile west of Anchorite Summit and about 2,000 feet south of Highway 31 in T. 4 N., R. 30 E.

#### **Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry from early July to October

**Soil temperature:** 47 to 49 degrees F

**Control section:** Content of rock fragments—0 to 15 percent pebbles; texture—averages sandy loam; clay content—5 to 15 percent

**C horizon:**

Rock fragments—0 to 15 percent pebbles

### **Jetcop Series**

The Jetcop series consists of shallow, well drained soils that formed in residuum derived from basalt with a component of volcanic ash. These soils are on plateaus. Slopes are 2 to 30 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Clayey, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Jetcop very stony loamy sand, 4 to 30 percent slopes, in an area of rangeland in the Jetcop-Gabbvally association, where pebbles cover about 30 percent of the surface, cobbles about 10 percent, and stones about 3 percent:

A1—0 to 3 inches; grayish brown (10YR 5/2) very stony loamy sand, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial and few very fine tubular pores; 15 percent pebbles, 20 percent cobbles, 5 percent stones; violently

effervescent; neutral (pH 6.8); clear smooth boundary.

**A2**—3 to 6 inches; light brownish gray (10YR 6/2) gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial and few very fine vesicular pores; 15 percent pebbles; neutral (pH 6.6); clear smooth boundary.

**Bt1**—6 to 9 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine to medium roots; common very fine tubular pores; 15 percent pebbles; common moderately thick clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

**Bt2**—9 to 16 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium angular blocky structure; hard, very friable, very sticky and very plastic; common very fine and few fine and medium roots; common very fine tubular pores; 30 percent pebbles; few thick clay films on faces of peds and many moderately thick clay films on faces of peds and lining pores; neutral (pH 7.0); clear wavy boundary.

**Bqkm**—16 to 60 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/3) moist; strongly cemented with silica and lime; highly fractured; violently effervescent; moderately alkaline (pH 8.3).

**Type location:** Mineral County, Nevada; approximately 4 miles west of Basalt site; about 1,840 feet north and 1,050 feet east of the southwest corner of sec. 18, T. 2 N., R. 33 E.; 38 degrees, 1 minute, 40 seconds north latitude and 118 degrees, 20 minutes, 55 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 54 to 59 degrees F

**Depth to indurated duripan:** 14 to 20 inches

**Control section:** Clay content—35 to 50 percent; texture—clay loam or clay; content of rock fragments—15 to 35 percent

**Reaction throughout the profile:** Neutral or mildly alkaline

**A horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

**Bt horizons:**

Hue—10YR or 7.5YR

Chroma—3 or 4

Texture—clay loam or clay

Clay content—35 to 50 percent

Rock fragments—15 to 35 percent

Structure—angular or subangular blocky in the Bt1 horizon; angular blocky in the Bt2 horizon

**Bqkm horizons:**

Chroma—2 or 3

Rock fragments—25 to 50 percent

Other features—continuous silica laminar cap 1 to 10 millimeters thick on the upper surface of the duripan over alternating layers of strong silica cementation and indurated silica laminae

### Karpp Family

The Karpp Family consists of shallow, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on lake terraces and alluvial fan piedmonts. Slopes are 0 to 8 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Durorthids

**Reference pedon:** Karpp Family, very gravelly sandy loam, in an area of rangeland:

**A1**—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, brown and dark brown (10YR 4/3) moist; massive; soft, friable, nonsticky and nonplastic; few medium roots; many very fine interstitial pores; 45 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

**A2**—2 to 9 inches; light brownish gray (10YR 6/2) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; few medium roots; common very fine interstitial pores; 75 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.

**Ckqm**—9 to 22 inches; indurated duripan.

**Type location:** Mineral County, Nevada; about 1,000 feet south and 600 feet west of the apparent northeast corner of sec. 32, T. 4 N., R. 29 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from early July to October

**Soil temperature:** 47 to 49 degrees F

*Depth to indurated duripan:* 8 to 16 inches

*Control section:* Content of rock fragments—50 to 70 percent pebbles; clay content—10 to 15 percent

### **Katyblay Series**

The Katyblay series consists of very deep, well drained soils that formed in volcanic ash over residuum and colluvium derived from altered volcanic rocks. These soils are on mountain slopes. Slopes are 30 to 75 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Andeptic Cryoboralfs

**Typical pedon:** Katyblay fine sandy loam, 30 to 50 percent slopes, in an area of rangeland in the Epvip-Hiridge-Katyblay association:

- A**—0 to 9 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; 10 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.
- Bw**—9 to 16 inches; light brownish gray (10YR 6/2) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; neutral (pH 6.6); clear smooth boundary.
- 2A2**—16 to 24 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few very fine interstitial and common very fine tubular pores; 20 percent pebbles; neutral (pH 6.6); clear smooth boundary.
- 2A3**—24 to 33 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular and few very fine interstitial pores; 30 percent pebbles; slightly acid (pH 6.4); gradual smooth boundary.
- 2Bt1**—33 to 44 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very

fine and fine roots; common very fine tubular pores; 55 percent pebbles; common thin clay films on faces of peds and lining pores; slightly acid (pH 6.2); clear smooth boundary.

**2Bt2**—44 to 60 inches; light brown (7.5YR 6/4) very gravelly sandy clay loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine roots; few very fine interstitial pores; 50 percent pebbles; common thin clay films bridging sand grains; medium acid (pH 6.0).

**Type location:** Mineral County, Nevada; approximately 2 miles south of Aurora; about 2,110 feet south and 330 feet west of the northeast corner of sec. 31, T. 5 N., R. 28 E.; 38 degrees, 15 minutes, 3 seconds north latitude and 118 degrees, 53 minutes, 23 seconds west longitude.

### **Range in Characteristics**

**Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 43 to 46 degrees F

**Average summer soil temperature:** 54 to 59 degrees F

**Depth to unconformable 2A horizon:** 15 to 30 inches

**Control section:** Clay content—18 to 25 percent; content of rock fragments—35 to 60 percent, mainly pebbles

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Reaction—slightly acid or neutral

Other features—range of 0.75 to 0.95 grams per cubic centimeter bulk density at 1/3 bar water tension

**Bw horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry, 3 moist

Reaction—slightly acid or neutral

**2A horizon:**

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3 dry or moist

Rock fragments—20 to 30 percent pebbles

Reaction—slightly acid or neutral

**2Bt horizon:**

Hue—10YR or 7.5YR

Value—4 or 5 moist

Chroma—4 to 6 dry or moist

Texture—sandy clay loam or loam

Clay content—18 to 25 percent

Rock fragments—35 to 60 percent, mostly pebbles  
Reaction—medium acid or slightly acid

### **Kawich Family**

The Kawich Family consists of deep, somewhat excessively drained soils that formed in eolian materials derived from mixed rock sources. These soils are on sand dunes. Slopes are 4 to 30 percent. Mean annual precipitation is about 10 to 14 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Reference pedon:** Kawich Family, fine sand, in an area of rangeland:

A—0 to 3 inches; pale brown (10YR 6/3) fine sand, dark grayish brown (2.5Y 4/2) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary.

C1—3 to 13 inches; pale brown (10YR 6/3) fine sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary.

C2—13 to 44 inches; pale brown (10YR 6/3) fine sand, grayish brown (2.5Y 5/2) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary.

C3—44 to 60 inches; pale brown (10YR 6/3) fine sand, dark grayish brown (2.5Y 4/2) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; approximately 22 miles south of Hawthorne; about 2,600 feet east and 1,000 feet south of the northwest corner of sec. 21, T. 5 N., R. 9 E.

#### **Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry from early July to October

**Soil temperature:** 47 to 49 degrees F

**Control section:** Clay content—5 to 10 percent

### **Kiote Series**

The Kiote series consists of very deep, well drained soils that formed in residuum and colluvium derived

from andesitic and rhyolitic rocks. These soils are on mountain slopes. Slopes are 15 to 50 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic Pachic Cryoborolls

**Typical pedon:** Kiote gravelly loam, 15 to 50 percent slopes, in an area of rangeland in the Granmount-Kiote-Hiridge association:

A1—0 to 2 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 20 percent pebbles; neutral (pH 6.6); clear smooth boundary.

A2—2 to 8 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 35 percent pebbles; neutral (pH 6.8); clear smooth boundary.

A3—8 to 18 inches; brown (10YR 4/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine interstitial pores; 50 percent pebbles; neutral (pH 6.8); clear smooth boundary.

Bt—18 to 38 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine tubular pores; common moderately thick clay films on faces of peds and in pores; 50 percent pebbles, 10 percent cobbles; neutral (pH 6.8); clear smooth boundary.

2C—38 to 60 inches; yellowish brown (10YR 5/4) extremely gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; common very fine tubular pores; clay coatings on rock fragments due to vertical and lateral water movement in pores; 60 percent pebbles, 10 percent cobbles; neutral (pH 6.8).

**Type location:** Mineral County, Nevada; about 500 feet east of the southwest corner of sec. 11, T. 8 N., R. 28 E.; 38 degrees, 33 minutes, 28 seconds north latitude, 118 degrees, 49 minutes, 49 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

*Soil temperature:* 41 to 45 degrees F

*Average summer soil temperature:* 54 to 59 degrees F

*Thickness of the mollic epipedon:* 16 to 24 inches

*Thickness of the solum:* 20 to 40 inches

*Control section:* Clay content—18 to 25 percent; content of rock fragments—45 to 60 percent, mostly pebbles (less than 15 percent cobbles and stones)

*Depth to bedrock:* More than 60 inches

#### A horizon:

Value—4 or 5 dry, 3 moist

Chroma—2 or 3

#### B horizon:

Value—4 or 5 dry, 3 or 4 moist

Chroma—2 to 4

Rock fragments—average of 45 to 60 percent; 60 to 80 percent in some subhorizons of some pedons

Clay content—18 to 25 percent

#### 2C horizon:

Rock fragments—clay coatings on rock fragments due to vertical and lateral water movements in some pedons; sand grains generally bleached clean by lateral water movements

### Koyen Series

The Koyen series consists of very deep, well drained soils that formed in loamy alluvium derived dominantly from volcanic rocks. These soils are on fanettes, inset fans, and fan aprons. Slopes are 0 to 8 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is approximately 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Typic Camborthids

**Typical pedon:** Koyen fine sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Goldyke-Blacktop-Koyen association:

A—0 to 2 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial and

few very fine and fine tubular pores; 12 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary.

Bw1—2 to 6 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate thick platy structure parting to weak fine and medium subangular blocky; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine interstitial and common very fine and fine tubular pores; 10 percent pebbles; strongly alkaline (pH 8.6); clear smooth boundary.

Bw2—6 to 18 inches; light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine interstitial and common very fine and fine tubular pores; 15 percent pebbles; slightly effervescent; strongly alkaline (pH 9.0); gradual smooth boundary.

Bk1—18 to 40 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial and tubular pores; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); gradual smooth boundary.

Bk2—40 to 60 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial and few very fine and fine tubular pores; 30 percent pebbles; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 3,000 feet south and 400 feet east of the northwest corner of sec. 31, T. 11 N., R. 31 E.; 38 degrees, 46 minutes, 20 seconds north latitude and 118 degrees, 32 minutes, 7 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Depth to Bk horizon:* 14 to 21 inches

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline; most alkaline in the Bk horizon

*Control section:* Texture—sandy loam, strata of fine

sandy loam, loam, or loamy sand in some pedons; content of rock fragments—averages 10 to 25 percent (as much as 40 percent pebbles in some horizons); clay content—10 to 18 percent

**Other features:** No 2C horizon in some pedons

**A horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—very thin to medium platy, very fine to medium subangular blocky, or massive

**Bw horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—appears massive but parts to very weak or weak coarse or medium subangular blocky

Carbonates—noncalcareous, except in the lower part

**Bk horizon:**

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Carbonates—strongly effervescent or violently effervescent

Structure—subangular blocky or massive

## Kyler Series

The Kyler series consists of very shallow, well drained soils formed in residuum and colluvium derived from limestone. These soils are on mountains and hills. Slopes are 8 to 75 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

**Typical pedon:** Kyler very gravelly fine sandy loam, 30 to 50 percent slopes, in an area of rangeland in the Stewval-Kyler association:

A—0 to 3 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak thin and medium platy structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; few very fine and fine vesicular and many very fine and fine interstitial pores; 40 percent pebbles; lime pendants on bottoms of rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Ck—3 to 11 inches; light yellowish brown (10YR 6/4)

very gravelly loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and nonplastic; many very fine and fine and few medium roots; common fine tubular and many very fine and fine interstitial pores; 25 percent pebbles, 15 percent cobbles; lime pendants on bottoms of rock fragments; violently effervescent; strongly alkaline (pH 8.6); clear irregular boundary.

R—11 inches; hard, unweathered limestone bedrock.

**Type location:** Mineral County, Nevada; about 500 feet west and 1,450 feet north of the southeast corner of sec. 9, T. 7 N., R. 33 E.; 38 degrees, 28 minutes, 39 seconds north latitude and 118 degrees, 17 minutes, 59 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture—dominantly loam, but strata of fine sandy loam, very fine sandy loam, or silt loam in some pedons; clay content—7 to 18 percent; content of rock fragments—35 to 60 percent

**Depth to bedrock:** 6 to 14 inches

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Carbonates:** Greater than 40 percent calcium carbonate equivalent; strongly effervescent or violently effervescent

**A horizon:**

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 or 3

Structure—platy, subangular blocky, or massive

**C horizon:**

Hue—10YR or 7.5YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture—loam, including strata of fine sandy loam or silt loam

Structure—massive or subangular blocky

Rock fragments—35 to 60 percent

Other features—up to 70 percent rock fragments in subhorizons of some pedons; a Bk horizon in some pedons

## Langston Family

The Langston Family consists of deep, well drained soils that formed in residuum, alluvium, and colluvium

derived from mixed rock sources. These soils are on dissected alluvial fan pediments or beach terraces. Slopes are 0 to 4 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy over sandy or sandy-skeletal, mixed, mesic Xerollic Haplargids

**Reference pedon:** Langston Family, loamy sand, in an area of rangeland:

- A**—0 to 4 inches; light gray (10YR 7/2) loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; mildly alkaline (pH 7.6); abrupt smooth boundary.
- Bt1**—4 to 9 inches; light gray (10YR 7/2) sandy loam, brown (10YR 4/3) moist; weak subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; common thin clay films bridging sand grains; moderately alkaline (pH 8.4); abrupt smooth boundary.
- Bt2**—9 to 14 inches; light gray (10YR 7/2) sandy clay loam, brown (10YR 4/3) moist; strong fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine roots; common very fine interstitial pores; common thick clay films bridging sand grains; moderately alkaline (pH 8.4); abrupt smooth boundary.
- Bkq1**—14 to 25 inches; light brownish gray (10YR 6/2) very gravelly sand, brown (10YR 5/3) moist; massive; soft, friable, nonsticky and nonplastic; few very fine roots; many fine and medium interstitial pores; 50 percent pebbles; 10 percent weakly cemented durinodes; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- Bkq2**—25 to 40 inches; light brownish gray (10YR 6/2) very gravelly sand, brown (10YR 5/3) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; 50 percent pebbles; 10 percent weakly cemented durinodes; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.
- Bk**—40 to 50 inches; light brownish gray (10YR 6/2) loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, friable, nonsticky and nonplastic; many very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8).

**Type location:** Mineral County, Nevada; approximately 33 miles south of Hawthorne; about 800 feet west and 1,000 feet south of the apparent northeast corner of sec. 31, T. 4 N., R. 29 E.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from early July to October

*Soil temperature:* 47 to 49 degrees F

*Control section:* Clay content—18 to 30 percent; texture—sandy loam, sandy clay loam

*Bt horizon:*

Texture—sandy loam, sandy clay loam

Thickness—8 to 20 inches

*Bqk horizon:*

Rock fragments—35 to 55 percent pebbles

### Lathrop Series

The Lathrop series consists of very deep, well drained soils that formed in alluvium derived from mixed rocks. These soils are on fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-loamy over sandy or sandy-skeletal, mixed, mesic Duric Haplargids

**Typical pedon:** Lathrop very gravelly sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Lathrop-Terlco-Izo association:

- A1**—0 to 1 inch; light gray (10YR 7/2) very gravelly sandy loam, grayish brown (10YR 5/2) moist; weak thin and medium platy structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine interstitial pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.
- A2**—1 to 5 inches; light gray (10YR 7/2) gravelly loam, grayish brown (10YR 5/2) moist; moderate thick platy structure; hard, very friable, sticky and slightly plastic; few very fine roots; many fine vesicular pores; 30 percent pebbles; strongly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.
- Bt**—5 to 11 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to weak fine subangular blocky; soft, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 25 percent pebbles; common thin clay films on faces of peds; strongly alkaline (pH 8.6); clear smooth boundary.
- Btk**—11 to 13 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to weak fine subangular blocky; soft, very friable,

sticky and plastic; common very fine and fine roots; common very fine tubular pores; 25 percent pebbles; many thin clay films on faces of peds; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

**2Bqk**—13 to 25 inches; very pale brown (10YR 7/3) very gravelly loamy sand, pale brown (10YR 6/3) moist; massive; hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine and fine interstitial pores; 50 percent pebbles, 10 percent cobbles; 60 percent discontinuous strong silica and lime cementation in the form of plates and pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.8); gradual wavy boundary.

**2Bk**—25 to 60 inches; light gray (10YR 7/2) extremely gravelly sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 50 percent pebbles, 10 percent cobbles; lime coatings on rock fragments; strongly effervescent; strongly alkaline (pH 8.8).

**Type location:** Mineral County, Nevada; about 800 feet east and 250 feet north of the southwest corner of sec. 5, T. 5 N., R. 37 E.; 38 degrees, 17 minutes, 47 seconds north latitude and 117 degrees, 53 minutes, 56 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to 2B horizon:** 10 to 27 inches

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—platy or massive

Reaction—moderately alkaline or strongly alkaline

Carbonates—slightly effervescent to violently effervescent

#### Bt and Btk horizons:

Hue—10YR or 7.5YR

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—clay loam, sandy clay loam, or loam

Clay content—20 to 30 percent

Rock fragments—10 to 30 percent, dominantly pebbles

Reaction—mildly alkaline to strongly alkaline

Carbonates—lime in thin filaments or masses in some pedons

Structure—prismatic, massive, or subangular blocky

#### 2Bqk horizon:

Value—6 to 8 dry, 5 to 7 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—loamy sand, loamy coarse sand, sand, coarse sand

Rock fragments—50 to 90 percent

Reaction—moderately alkaline to very strongly alkaline

Carbonates—strongly effervescent or violently effervescent

Consistence—hard or very hard dry, firm or very firm moist in cemented parts; slightly hard dry, very friable moist in noncemented parts; weak to strong discontinuous silica and lime cementation

Durinodes—20 to 40 percent durinodes in soils with friable matrixes

#### 2Bk horizon:

Value—6 to 8 dry, 5 to 7 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—loamy sand, loamy coarse sand, sand, coarse sand

Rock fragments—50 to 90 percent

Reaction—moderately alkaline or strongly alkaline

Carbonates—noncalcareous, with lime coating the undersides of rock fragments

### Lazan Series

The Lazan series consists of very shallow, somewhat excessively drained soils that formed in residuum and colluvium derived from granitic rock. These soils are on mountain side slopes and pediment remnants. Slopes are 8 to 75 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic, shallow Typic Xerorthents

**Typical pedon:** Lazan very gravelly coarse sand, 50 to 75 percent slopes, in an area of woodland in the Nupart-Lazan-Rock outcrop association, where pebbles cover about 60 percent of the surface, cobbles about 5 percent, and stones about 1 percent:

A1—0 to 1 inch; pale brown (10YR 6/3) very gravelly

coarse sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 50 percent pebbles; neutral (pH 7.0); clear smooth boundary.

A2—1 to 4 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 50 percent pebbles; neutral (pH 6.8); clear wavy boundary.

Cr—4 inches; highly fractured granitic bedrock.

**Type location:** Mineral County, Nevada; in the Wassuk Range; about 1,000 feet south and 2,400 feet east of the northwest corner of sec. 32, T. 7 N., R. 30 E.; 38 degrees, 27 minutes, 36 seconds north latitude and 118 degrees, 42 minutes, 57 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 47 to 53 degrees F

*Control section:* Clay content—3 to 10 percent; texture—coarse sand, loamy coarse sand, thin horizons of coarse sandy loam in some pedons; content of rock fragments—35 to 60 percent, predominantly pebbles 2 to 5 millimeters in size

*Reaction throughout the profile:* Neutral or mildly alkaline

*Carbonates:* Noneffervescent or slightly effervescent

*Depth to weathered bedrock:* 4 to 10 inches

*A horizon:*

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 4 dry or moist

Structure—single grained or weak subangular blocky

#### Lazan Family

The Lazan Family consists of shallow, somewhat excessively drained soils that formed in alluvium and colluvium derived from granitic rock. These soils are on mountain slopes. Slopes are 50 to 75 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic, shallow Typic Xerorthents

**Reference pedon:** Lazan Family, gravelly sand, in an area of rangeland where pebbles cover about 20 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 30 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

A2—2 to 4 inches; light brownish gray (10YR 6/2) very gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine and fine interstitial pores; 50 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

Cr—4 to 23 inches; highly weathered granitic bedrock (gruss).

R—23 inches; compact granitic bedrock.

**Type location:** Mineral County, Nevada; approximately 15 miles south of Hawthorne; about 1,300 feet west and 800 feet north of the southeast corner of sec. 33, T. 6 N., R. 30 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from early July to October

*Soil temperature:* 47 to 49 degrees F

*Depth to weathered granitic bedrock (gruss):* 4 to 16 inches

*Control section:* Content of rock fragments—35 to 50 percent pebbles; texture—sand; clay content—0 to 5 percent

#### Lithic Xerorthents

The Lithic Xerorthents consist of shallow, somewhat excessively drained soils developed from wind-deposited volcanic ash (pumice). These soils are on rock pediments. Slopes are 2 to 8 percent. Mean annual precipitation is about 12 inches, and mean annual air temperature is about 46 degrees F.

**Reference pedon:** Lithic Xerorthents, in an area of rangeland where cobbles cover about 50 percent of the surface:

A1—0 to 2 inches; very pale brown (10YR 7/3) very cobbly fine sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few root crowns; common very fine and fine interstitial pores; 50 percent cobbles; neutral (pH 6.6); clear wavy boundary.

C—2 to 9 inches; light yellowish brown (10YR 6/4) very cobbly fine sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few medium roots; common fine and medium pores; 60

percent cobbles; neutral (pH 6.6); abrupt smooth boundary.

R—9 inches; hard andesitic bedrock.

**Type location:** Mineral County, Nevada; approximately 13 miles south of Hawthorne; about 1,100 feet north and 150 feet east of the southwest corner of sec. 28, T. 6 N., R. 29 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from early July to October

*Soil temperature:* 45 to 47 degrees F

*Depth to bedrock:* 8 to 16 inches

*Control section:* Content of rock fragments—45 to 55 percent

*C horizon:*

Texture—very cobbly fine sand, extremely cobbly fine sand

Rock fragments—45 to 70 percent

### Logring Series

The Logring series consists of very shallow, well drained soils that formed in residuum and colluvium derived from limestone, dolomite, and other highly calcareous sedimentary rocks. These soils are on mountain slopes and hills. Slopes are 8 to 50 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

**Typical pedon:** Logring very gravelly fine sandy loam, 30 to 50 percent slopes, in an area of woodland in the Logring-Kyler, steep, association:

A—0 to 3 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate thick platy structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; common fine, medium, and coarse interstitial pores; 40 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bw—3 to 7 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common medium and many very fine and fine roots; many very fine and fine interstitial pores; 35 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

Bk—7 to 13 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; 50 percent pebbles; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

R—13 inches; hard limestone bedrock with lime in fractures.

**Type location:** Mineral County, Nevada; about 1,050 feet north of the southeast corner of sec. 12, T. 6 N., R. 36 E.; 38 degrees, 23 minutes, 17 seconds north latitude and 117 degrees, 52 minutes, 45 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 47 to 50 degrees F

*Control section:* Texture—loam, fine sandy loam, or sandy loam; clay content—8 to 18 percent; content of rock fragments—35 to 60 percent

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

*Carbonates:* Strongly effervescent or violently effervescent throughout; 40 to 60 percent calcium carbonate equivalent; 15 to 40 percent finely divided lime in the upper 18 centimeters

*Organic carbon:* 1.0 to 1.5 percent in the upper 18 centimeters

*Depth to bedrock:* 7 to 14 inches

*A horizon:*

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 to 4

*Bw horizon:*

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 to 4

### Lomoiné Series

The Lomoiné series consists of very shallow, well drained soils that formed in residuum and colluvium derived from granitic rocks and welded rhyolitic tuff. These soils are on mountain slopes and hills. Slopes are 8 to 75 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Xeric Torriorthents

**Typical pedon:** Lomoiné very cobbly sandy loam, 30 to 50 percent slopes, in an area of rangeland in the Lomoiné-Kyler-Petspring association:

A—0 to 2 inches; light brownish gray (10YR 6/2) very cobbly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; 30 percent pebbles, 25 percent cobbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary.

C—2 to 6 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark brownish gray (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial pores; 55 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

R—6 inches; hard granitic bedrock; weathered in the upper 6 inches.

**Type location:** Mineral County, Nevada; about 600 feet north and 1,200 feet east of the southwest corner of sec. 11, T. 9 N., R. 31 E.; 38 degrees, 39 minutes, 4 seconds north latitude and 118 degrees, 29 minutes, 45 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to bedrock:** 3 to 14 inches

**Control section:** Texture of the fraction less than 2 millimeters—averages coarse sandy loam or sandy loam; clay content—8 to 15 percent; content of rock fragments—35 to 55 percent with a high percentage of pebbles 2 to 5 millimeters in size

**Reaction throughout the profile:** Mildly alkaline or moderately alkaline

**Carbonates:** Calcareous; generally slightly effervescent to strongly effervescent throughout; 5 percent calcium carbonate equivalent

**A horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

**C horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—coarse sandy loam or sandy loam

Rock fragments—35 to 55 percent rock fragments with numerous fine pebbles (less than 5 millimeters in size)

#### Loomer Series

The Loomer series consists of shallow, well drained soils that formed in residuum derived from andesite, rhyolite, and basalt. These soils are on side slopes and ridges of low hills and mountains. Slopes are 8 to 75 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Lithic Argixerolls

**Typical pedon:** Loomer very gravelly sandy loam, 8 to 30 percent slopes, in an area of rangeland in the Wassit-Loomer association:

A—0 to 2 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; many very fine roots; few fine vesicular and many very fine and fine interstitial pores; 40 percent pebbles, 15 percent cobbles; neutral (pH 6.6); clear smooth boundary.

A2—2 to 7 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common medium and many very fine and fine roots; common fine tubular and many very fine and fine interstitial pores; 30 percent pebbles; neutral (pH 6.8); clear wavy boundary.

Bt1—7 to 10 inches; brown (10YR 5/3) extremely gravelly clay, dark brown (10YR 3/3) moist; strong fine and medium subangular blocky structure parting to strong very fine angular blocky; hard, friable, very sticky and very plastic; common very fine to medium roots; few fine interstitial and common fine and medium tubular pores; 45 percent pebbles, 20 percent cobbles; many moderately thick pressure faces; neutral (pH 6.8); clear wavy boundary.

Bt2—10 to 17 inches; dark brown (7.5YR 4/4) extremely gravelly clay, dark brown (7.5YR 4/4) moist; strong fine and medium angular blocky structure; hard, friable, very sticky and very plastic; few very fine and fine roots; common very fine and fine tubular pores; 55 percent angular pebbles, 20 percent cobbles; continuous thick pressure faces; neutral (pH 6.8); clear irregular boundary.

R—17 inches; hard, fractured rhyolite.

**Type location:** Mineral County, Nevada; approximately 1 mile northwest of Thunder Mountain; about 700 feet east and 625 feet south of the northwest corner of sec. 4, T. 6 N., R. 34 E.; 38 degrees, 19 minutes, 33 seconds north latitude and 118 degrees, 12 minutes, 57 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist from late fall to spring, dry from summer to early fall

*Soil temperature:* 47 to 53 degrees F

*Thickness of the mollic epipedon:* 7 to 10 inches; value of less than 5.5 dry and 3.5 moist and chroma of less than 3.5 moist in the upper 7 inches (mixed)

*Depth to bedrock:* 14 to 20 inches

*Control section:* Clay content—35 to 50 percent; content of rock fragments—60 to 80 percent, mostly angular pebbles and cobbles

*Reaction throughout the profile:* Neutral or mildly alkaline

*Other features:* Common fractures in the upper part of the bedrock

#### A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Structure—granular or platy

#### Bt1 horizon:

Hue—10YR or 7.5YR

Value—4 or 5 dry, 3 or 4 moist

Chroma—2 or 3

Rock fragments—50 to 70 percent, mainly pebbles or cobbles

#### Bt2 and Bt3 horizons:

Hue—10YR, 7.5YR, or 5YR

Value—4 to 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—extremely gravelly or extremely cobbly clay loam or clay

Clay content—35 to 50 percent

Rock fragments—60 to 80 percent, mainly angular pebbles and cobbles

### Luning Series

The Luning series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from mixed sources. These soils are on fan skirts. Slopes are 0 to 4 percent. Mean annual precipitation is about 4 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Typic Torriorthents

**Typical pedon:** Luning loamy sand, 2 to 4 percent slopes, in an area of rangeland in the Luning-Sundown association:

- A—0 to 4 inches; pale brown (10YR 6/3) loamy sand, dark brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and few fine roots; common fine and medium interstitial pores; 3 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.
- C1—4 to 7 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; common medium interstitial and few medium tubular pores; 45 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.
- C2—7 to 11 inches; pale brown (10YR 6/3) gravelly loamy sand, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium and coarse roots; common fine interstitial and few fine tubular pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- C3—11 to 15 inches; pale brown (10YR 6/3) very gravelly coarse sand, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common medium and coarse interstitial pores; 40 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.
- C4—15 to 42 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common fine interstitial and few medium and coarse tubular pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.
- C5—42 to 52 inches; pale brown (10YR 6/3) very gravelly sand, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; common medium interstitial pores; 45 percent pebbles, 5 percent stones; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.
- C6—52 to 60 inches; pale brown (10YR 6/3) fine sand, dark brown (10YR 4/3) moist; single grained; loose,

nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial pores; 2 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; approximately 2 miles northeast of Kinkaid along the pole-line road; about 2,600 feet east and 1,000 feet north of the southwest corner of sec. 18, T. 8 N., R. 33 E.; 38 degrees, 32 minutes, 57 seconds north latitude and 118 degrees, 20 minutes, 47 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and spring and from 10 to 20 days cumulative between July and October due to convection storms; dry in the lower part of the moisture control section

**Soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—2 to 8 percent; texture—averages loamy sand or sand; content of rock fragments—10 to 30 percent (dominantly 2 to 5 millimeters), greater than 35 percent in some strata

**Reaction throughout the profile:** Mildly alkaline to strongly alkaline

**Other features:** Discontinuous thin strata (½ inch to 2 inches) of light sandy loam in some pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Structure—massive, single grained, or platy

Carbonates—noneffervescent to strongly effervescent

#### C horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Texture of the fraction less than 2 millimeters—loamy sand, sand, or coarse sand with thin strata of light sandy loam

Other features—stratified horizons

Carbonates—slightly effervescent to violently effervescent

Structure—massive or subangular blocky

### Madeline Family

The Madeline Family consists of shallow, well drained soils that developed from volcanic rock sources. These soils are on mountain side slopes. Slopes are 15 to 50 percent. Mean annual precipitation is about 14

inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid Lithic Argixerolls

**Reference pedon:** Madeline Family, gravelly sandy loam, in an area of rangeland where pebbles cover about 60 percent of the surface:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; massive; soft, friable, nonsticky and nonplastic; few very fine roots; common fine tubular pores; 20 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

A2—2 to 5 inches; dark gray (10YR 4/1) clay loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, friable; slightly sticky and slightly plastic; few medium and coarse roots; common fine and medium interstitial pores; neutral (pH 6.6); abrupt smooth boundary.

Bt—5 to 10 inches; brown (7.5YR 5/2) clay, dark brown (7.5YR 3/2) moist; moderate medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; few medium roots; many very fine and fine interstitial pores; continuous pressure cutans; neutral (pH 6.6); abrupt wavy boundary.

R—10 inches; andesitic tuff, weathered in the upper 6 inches.

**Type location:** Mineral County, Nevada; approximately 35 miles south and west of Hawthorne; about 400 feet north and 600 feet west of the southeast corner of sec. 9, T. 6 N., R. 26 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 45 to 47 degrees F

**Thickness of the mollic epipedon:** 7 to 10 inches

**Depth to hard bedrock:** 10 to 20 inches

**Control section:** Clay content—40 to 50 percent

#### A horizon:

Reaction—slightly acid or neutral

#### Bt horizon:

Value—5 or 6 dry, 3 or 4 moist

Clay content—40 to 55 percent

Thickness—5 to 12 inches

## Merino Family

The Merino Family consists of shallow, well drained soils that formed in alluvium and residuum derived from andesitic rock sources. These soils are on mountain ridges and side slopes at higher elevations. Slopes are 30 to 50 percent. Mean annual precipitation is about 20 inches, and mean annual air temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, nonacid Lithic Cryorthents

**Reference pedon:** Merino Family, extremely gravelly coarse sand, in an area of rangeland where gravel pavement covers about 7 percent of the surface:

- A1—0 to 2 inches; brown and dark brown (10YR 4/3) extremely gravelly coarse sand, very dark brown (10YR 2/2) moist; single grained; loose, nonsticky and nonplastic; many very fine roots; common fine and medium interstitial pores; 70 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.
- A2—2 to 5 inches; light brownish gray (10YR 6/2) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, slightly sticky and slightly plastic; common fine and medium roots; many very fine interstitial pores; 15 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.
- C—5 to 12 inches; brown (10YR 5/3) extremely gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, friable, slightly sticky and slightly plastic; common fine and medium roots; many medium interstitial pores; 80 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.
- R—12 inches; hard andesitic bedrock.

**Type location:** Mineral County, Nevada; approximately 12 miles south of Hawthorne; about 2,500 feet south and 1,000 feet west of the northeast corner of sec. 13, T. 6 N., R. 29 E.

### Range in Characteristics

**Soil moisture:** Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Mean annual soil temperature:** 44 to 46 degrees F

**Mean summer soil temperature:** 56 to 58 degrees F

**Depth to bedrock:** 10 to 16 inches

**Control section:** Content of rock fragments—50 to 70 percent pebbles

**A horizon:**

Structure—single grained or massive

**C horizon:**

Value—5 or 6 dry, 3 or 4 moist

## Mickey Series

The Mickey series consists of shallow, well drained soils that formed in mixed alluvium derived mainly from granitic rocks and from volcanic rocks with a component of ash. These soils are on ballenas and fan piedmonts. Slopes are 2 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Durargids

**Typical pedon:** Mickey gravelly loamy sand, 2 to 8 percent slopes, in an area of rangeland in the Mickey-Veet association:

- A1—0 to 2 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine tubular pores; 25 percent pebbles, 5 percent cobbles; neutral (pH 6.8); abrupt smooth boundary.
- A2—2 to 5 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine vesicular and tubular pores; 35 percent pebbles; neutral (pH 7.2); abrupt wavy boundary.
- Bt1—5 to 10 inches; pale brown (10YR 6/3) gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine tubular and vesicular pores; few thin clay films lining pores; 20 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary.
- Bt2—10 to 15 inches; yellowish brown (10YR 5/6) gravelly sandy clay loam, dark yellowish brown (10YR 4/6) moist; strong fine subangular blocky structure; hard, firm, sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; many moderately thick clay films lining pores; few thin clay films coating faces of peds; many pressure faces on peds; 15 percent

pebbles; mildly alkaline (pH 7.8); abrupt wavy boundary.

**Bqkm**—15 to 37 inches; strongly cemented duripan broken by a few krotovinas of gravelly coarse sandy loam; massive; very hard, very firm; few fine roots in fractures; few thick prominent white (10YR 8/1) lime filaments and soft masses; slightly effervescent; clear wavy boundary.

**Bqk**—37 to 44 inches; light yellowish brown (2.5Y 6/4) gravelly loamy coarse sand, olive brown (2.5Y 4/4) moist; massive; hard, brittle, nonsticky and nonplastic; few very fine and fine roots; many very fine vesicular pores; 30 percent pebbles; common thin lime and silica pendants on rock fragments; weak continuous silica and lime cementation; slightly effervescent; mildly alkaline (pH 7.6); abrupt wavy boundary.

**C1**—44 to 54 inches; light yellowish brown (2.5Y 6/4) very gravelly sandy loam, olive brown (2.5Y 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 30 percent pebbles, 5 percent cobbles; few thin lime pendants on rock fragments; slightly effervescent; neutral (pH 7.2); abrupt smooth boundary.

**C2**—54 to 60 inches; light yellowish brown (2.5Y 6/4) very gravelly coarse sandy loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 35 percent pebbles; few thin lime pendants on rock fragments; slightly effervescent; mildly alkaline (pH 7.6).

**Type location:** Mineral County, Nevada; Highway 3C about 150 feet east and 150 feet north of the road to Baldwin Canyon; about 2,300 feet south and 1,600 feet east of the northwest corner of sec. 31, T. 7 N., R. 28 E.; 38 degrees, 25 minutes, 25 seconds north latitude and 118 degrees, 53 minutes, 38 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Depth to cemented pan:** 14 to 20 inches

**Control section:** Clay content—27 to 35 percent; texture of the fraction less than 2 millimeters—sandy clay loam or clay loam (mixed); content of rock fragments—15 to 35 percent, dominantly pebbles (cobbles or stones in some pedons)

**Carbonates:** Slightly or strongly calcareous substratum in most pedons

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Reaction—neutral to moderately alkaline

#### Bt1 horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 to 4

Texture—sandy clay loam or loam

Clay content—20 to 27 percent

Rock fragments—15 to 35 percent, mainly pebbles

Structure—subangular blocky or granular

Reaction—neutral or mildly alkaline

#### Bt2 horizon:

Hue—10YR or 7.5YR

Value—4 to 6 dry, 4 or 5 moist

Chroma—3 to 6

Texture—sandy clay loam, clay loam, or sandy clay; subhorizons of clay in some pedons

Clay content—30 to 40 percent

Rock fragments—15 to 35 percent

Structure—angular or subangular blocky

Reaction—neutral to moderately alkaline

#### Bqkm horizon:

Duripan—strongly cemented; discontinuous thin laminar caps in some pedons

#### C horizon:

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—stratified; sandy loam or coarse sandy loam (mixed)

Rock fragments—35 to 60 percent; 20 to 80 percent in individual strata

Reaction—neutral to moderately alkaline

### Mirkwood Series

The Mirkwood series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium derived from volcanic rock. These soils are on mountain side slopes. Slopes are 30 to 75 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Haplargids

**Typical pedon:** Mirkwood extremely stony sandy loam, 30 to 75 percent slopes, in an area of rangeland in the Gabbvally-Tejabe-Mirkwood association, where

stones cover about 30 percent of the surface, cobbles about 15 percent, and pebbles about 25 percent:

- A—0 to 1 inch; very pale brown (10YR 6/3) extremely stony sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular and common very fine interstitial pores; 45 percent pebbles, 15 percent cobbles, 20 percent stones; neutral (pH 7.3); clear smooth boundary.
- Bt—1 to 5 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; few very fine roots; common very fine tubular pores; 40 percent pebbles; common thin clay films on faces of peds; neutral (pH 7.3); abrupt wavy boundary.
- R—5 inches; hard rhyolite.

**Type location:** Mineral County, Nevada; approximately 3 miles northeast of Mount Ferguson; about 790 feet south and 425 feet east of the northwest corner of sec. 31, T. 10 N., R. 35 E.; 38 degrees, 41 minutes, 14 seconds north latitude and 118 degrees, 7 minutes, 58 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—18 to 27 percent; content of rock fragments—35 to 50 percent pebbles, cobbles, and stones

**Reaction throughout the profile:** Neutral to strongly alkaline

**Depth to fractured bedrock:** 4 to 14 inches

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist  
Chroma—2 to 4

#### B horizon:

Hue—10YR or 7.5YR  
Value—5 to 7 dry, 4 or 5 moist  
Chroma—2 to 4  
Texture—loam or clay loam  
Clay content—25 to 35 percent  
Rock fragments—35 to 50 percent  
Carbonates—effervescent in the lower part in some pedons

## Mopana Series

The Mopana series consists of shallow, well drained soils that formed in residuum derived from basalt with a component of volcanic ash. These soils are on plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is 42 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid, shallow Abruptic Aridic Durixerolls

**Typical pedon:** Mopana stony fine sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Mopana-Nire association, where pebbles cover about 15 percent of the surface, cobbles about 5 percent, and stones about 2 percent:

- A1—0 to 4 inches; brown (10YR 5/3) stony fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine interstitial and few very fine tubular pores; 10 percent pebbles; neutral (pH 7.0); clear wavy boundary.
- A2—4 to 8 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, sticky and plastic; common very fine to medium roots; few very fine interstitial and common very fine tubular pores; few moderately thick and common thin clay films on faces of peds; 5 percent pebbles, 5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary.
- Bt—8 to 17 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 3/4) moist; strong fine and medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; few very fine roots between peds; common very fine tubular pores; continuous thick pressure faces; 5 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear wavy boundary.
- Btqk—17 to 19 inches; light brown (7.5YR 6/4) gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate medium platy structure; hard, friable, sticky and plastic; common very fine tubular pores; 35 percent discontinuous strongly cemented silica plates; few thick and common moderately thick pressure faces; 15 percent pebbles, 5 percent cobbles; few fine lime filaments or threads; noneffervescent matrix; neutral (pH 7.2); abrupt wavy boundary.
- Bqkm—19 to 60 inches; indurated duripan; 1- to 2-millimeter continuous silica laminar cap; continuous strong silica cementation over

discontinuous laminar cap 1 to 2 millimeters thick lining fractures; violently effervescent.

**Type location:** Mineral County, Nevada; approximately 3 miles west of Aurora; about 1,650 feet east and 660 feet north of the southwest corner of sec. 15, T. 5 N., R. 27 E.; 38 degrees, 17 minutes, 8 seconds north latitude and 118 degrees, 56 minutes, 10 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 47 degrees F

**Thickness of the mollic epipedon:** 7 to 10 inches, excluding the Bt horizon

**Depth to duripan:** 14 to 20 inches

**Depth to Bt horizon:** 7 to 10 inches

**Control section:** Clay content—35 to 50 percent; texture—clay or clay loam; content of rock fragments—0 to 25 percent, dominantly pebbles

**A horizon:**

Chroma—2 or 3 dry or moist

**Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist

Texture—clay or clay loam

Clay content—35 to 50 percent

Rock fragments—0 to 25 percent, dominantly pebbles

Reaction—neutral or mildly alkaline

### Nemico Series

The Nemico series consists of shallow, well drained soils that formed in residuum derived from basalt. These soils are on plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Typic Nadurargids

**Typical pedon:** Nemico very stony fine sandy loam, 2 to 15 percent slopes, in an area of rangeland in the Downeyville-Mirkwood-Nemico association, where pebbles cover about 15 percent of the surface, cobbles about 20 percent, and stones about 3 percent:

A1—0 to 1 inch; very pale brown (10YR 7/3) very stony fine sandy loam, brown (10YR 5/3) moist; moderate

medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and medium vesicular pores; 15 percent pebbles, 20 percent cobbles, 3 percent stones; strongly alkaline (pH 8.6); clear smooth boundary.

A2—1 to 2 inches; light gray (10YR 7/2) very fine sandy loam, grayish brown (10YR 5/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine to medium vesicular pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

Btn1—2 to 5 inches; dark yellowish brown (10YR 4/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to strong medium subangular blocky; hard, firm, very sticky and plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick clay films coating faces of peds and pores; slightly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.

Btn2—5 to 9 inches; dark yellowish brown (10YR 4/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick clay films coating faces of peds and pores; 25 percent pebbles; slightly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.

Btqk—9 to 15 inches; brown (7.5YR 4/4) gravelly clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, sticky and plastic; few very fine and fine roots; common very fine tubular pores; common moderately thick clay films coating faces of peds; 20 percent pebbles with silica and lime pendants; strongly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

Bqkm—15 to 16 inches; light gray (10YR 7/2) indurated duripan, pale brown (10YR 6/3) moist; continuous silica laminae over fractured basalt bedrock.

R—16 inches; fractured basalt bedrock.

**Type location:** Mineral County, Nevada; 750 feet north and 2,650 feet west of the southeast corner of sec. 31, T. 11 N., R. 32 E.; 38 degrees, 46 minutes, 33 seconds north latitude and 118 degrees, 24 minutes, 49 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10

to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees

*Control section:* Clay content—35 to 45 percent; content of rock fragments—15 to 35 percent

*Depth to duripan:* 10 to 20 inches

*Depth to bedrock:* 11 to 25 inches

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—1 to 4

Reaction—neutral to strongly alkaline

**Bt horizon:**

Hue—10YR or 7.5YR

Value—4 to 6 dry, 4 or 5 moist

Chroma—2 to 4

Texture—clay or clay loam

Rock fragments—as much as 30 percent

Structure—fine or medium prismatic parting to subangular blocky or angular blocky

Reaction—moderately alkaline or strongly alkaline

Sodium adsorption ratio—30 to 60 percent

**Bqk horizon:**

Hue—10YR or 7.5YR

Value—6 to 8 dry, 5 to 7 moist

Reaction—moderately alkaline or strongly alkaline

## Nire Series

The Nire series consists of very deep, well drained soils that formed in residuum and colluvium derived from volcanic rock with a component of eolian volcanic ash. These soils are on plateaus and mountains. Slopes are 4 to 50 percent. Mean annual precipitation is 17 inches, and mean annual temperature is 42 degrees F.

**Taxonomic class:** Loamy-skeletal over clayey, mixed Argic Pachic Cryoborolls

**Typical pedon:** Nire stony fine sandy loam, 4 to 15 percent slopes, in an area of rangeland where pebbles cover about 15 percent of the surface, cobbles about 1 percent, and stones about 2 percent:

A1—0 to 2 inches; grayish brown (10YR 5/2) stony fine sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine roots; common very fine and fine interstitial pores; 10 percent pebbles, 20 percent stones; neutral (pH 6.6); clear smooth boundary.

A2—2 to 15 inches; brown (10YR 5/3) stony fine sandy loam, dark brown (10YR 3/3) moist; weak fine and

medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; common very fine and fine interstitial pores; 10 percent pebbles, 20 percent stones; neutral (pH 6.8); clear wavy boundary.

BAt—15 to 27 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium angular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial and common very fine and fine tubular pores; 35 percent pebbles, 15 percent cobbles, 5 percent stones; very few thin clay films on faces of peds; neutral (pH 6.8); clear wavy boundary.

Bt1—27 to 39 inches; brown (10YR 5/3) very stony fine sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine and few fine roots; common fine tubular pores; 25 percent pebbles, 10 percent cobbles, 10 percent stones; few thin clay films on faces of peds; neutral (pH 6.6); clear wavy boundary.

2Bt2—39 to 60 inches; dark yellowish brown (10YR 4/6) cobbly clay, dark yellowish brown (10YR 4/4) moist; 1/2- to 3-inch pockets with bleached sand grains, light gray (10YR 7/2) dry; weak coarse prismatic structure parting to strong fine to medium angular blocky; hard, firm, very sticky and very plastic; common very fine roots matted on faces of peds; few very fine tubular pores; 10 percent pebbles, 20 percent cobbles; continuous thick clay films on faces of peds and lining pores; neutral (pH 7.0).

**Type location:** Mineral County, Nevada; approximately 3/4 mile southwest of Mount Hicks; 2,000 feet east and 2,335 feet north of the southwest corner of sec. 23, T. 5 N., R. 28 E.; 38 degrees, 16 minutes, 40 seconds north latitude and 118 degrees, 49 minutes, 28 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

*Soil temperature:* 43 to 46 degrees F

*Average summer soil temperature:* 55 to 58 degrees F

*Thickness of the mollic epipedon:* 16 to 39 inches, including the BAt horizon, if it occurs; may include the Bt1 horizon

*Depth to Bt1 horizon:* 12 to 30 inches

*Depth to 2Bt horizon:* 30 to 40 inches

*Control section:* Clay content—averages 14 to 20 percent in the upper part, 40 to 50 percent in the lower part; content of rock fragments—averages 35 to 60 percent in the upper part, 25 to 35 percent in the lower part

*Other features:* Textures of the A1, A2, BA1, and Bt1 horizons influenced by eolian volcanic ash deposits

*A horizon:*

Chroma—2 or 3

Structure—subangular blocky or single grained in the A1 horizon, subangular blocky in the A2 horizon

*Bt1 horizon:*

Value—4 or 5 dry, 3 or 4 moist

Texture—very gravelly fine sandy loam, very stony fine sandy loam, or very gravelly sandy loam

Clay content—14 to 20 percent

Rock fragments—averages 35 to 60 percent (more than 40 percent cobbles and stones)

Structure—subangular or angular blocky

*2Bt2 horizon:*

Chroma—4 to 6 dry or moist

Clay content—40 to 50 percent

Rock fragments—25 to 35 percent, predominantly cobbles or stones

## ***Nuahs Series***

The Nuahs series consists of very deep, well drained soils that formed in mixed alluvium derived dominantly from granitic and rhyolitic sources. These soils are on fan skirts. Slopes are 0 to 8 percent. Mean annual precipitation is about 4 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Typic Calciorthids

**Typical pedon:** Nuahs loamy sand, 0 to 4 percent slopes, in an area of rangeland:

A—0 to 4 inches; pale brown (10YR 6/3) loamy sand, dark yellowish brown (10YR 4/4) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 5 percent 2- to 5-millimeter pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk1—4 to 7 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/6) moist; weak thin

platy structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; many fine and very fine interstitial pores; 5 percent 2- to 5-millimeter pebbles; disseminated lime; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bk2—7 to 12 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/6) moist; weak medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common medium, fine, and very fine roots; few fine tubular and common very fine interstitial pores; 10 percent 2- to 5-millimeter pebbles; disseminated lime; strongly effervescent; very strongly alkaline (pH 9.2); clear wavy boundary.

Bk3—12 to 18 inches; pale brown (10YR 6/3) coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few medium and fine roots; many very fine interstitial pores; few fine lime filaments and lime pendants on undersides of pebbles; 10 percent 2- to 5-millimeter pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

2C—18 to 22 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; massive; hard, very friable, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; 35 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

3Cq—22 to 33 inches; pale brown (10YR 6/3) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots at top of horizon; common very fine interstitial pores; 10 percent 2- to 5-millimeter pebbles; thin discontinuous silica laminae plates 1 to 3 millimeters thick; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

4Cy—33 to 47 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine interstitial pores; 40 percent pebbles, 5 percent cobbles; few gypsum crystals on undersides of cobbles and some pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

5C—47 to 60 inches; pale brown (10YR 6/3) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common

very fine interstitial pores; 10 percent 2- to 5-millimeter pebbles; slightly effervescent; moderately alkaline (pH 8.3).

**Type location:** Mineral County, Nevada; about 3,695 feet west and 7,920 feet north of the junction of Highways 95 and 23; about 1,000 feet north and 1,500 feet east of the southwest corner of sec. 21, T. 8 N., R. 34 E.; 38 degrees, 32 minutes, 3 seconds north latitude and 118 degrees, 9 minutes, 3 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist for short periods in winter and from 10 to 20 days cumulative between July and September due to convection storms; dry in the lower part of the moisture control section

**Soil temperature:** 54 to 59 degrees F

**Control section:** Clay content—10 to 15 percent; content of rock fragments—averages 15 to 35 percent, mainly pebbles, over half of which are 2 to 5 millimeters in diameter

**Depth to calcic horizon:** 4 to 12 inches

**Electrical conductivity throughout the profile:** 2 to 16 millimhos

**Sodium adsorption ratio:** 13 to 30

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist  
Chroma—3 or 4

#### B horizon:

Value—6 or 7 dry, 4 or 5 moist  
Chroma—3 or 4 dry, 4 to 6 moist  
Texture—coarse sandy loam or sandy loam, with strata of loamy sand in some pedons  
Clay content—10 to 18 percent  
Rock fragments—less than 15 percent, dominantly 2- to 5-millimeter pebbles  
Reaction—strongly alkaline or very strongly alkaline  
Carbonates—5 to 15 percent calcium carbonate equivalent

#### C horizon:

Value—6 or 7 dry, 4 or 5 moist  
Chroma—3 or 4  
Texture—stratified fine sandy loam to very gravelly loamy coarse sand  
Clay content—5 to 15 percent  
Rock fragments—10 to 50 percent in individual horizons, mostly 2- to 5-millimeter pebbles; average of 15 to 35 percent  
Reaction—moderately alkaline or strongly alkaline  
Carbonates—slightly effervescent to strongly

effervescent; less than 5 percent calcium carbonate equivalent

Other features—gypsum crystals on the undersides of some cobbles and pebbles in some pedons below a depth of 30 inches; thin discontinuous silica laminae 1 to 3 millimeters thick or 5 to 15 percent weak to strong durinodes in some pedons

### Nupart Series

The Nupart series consists of very shallow, somewhat excessively drained soils that formed in residuum and colluvium derived from granitic rocks. These soils are on mountains and side slopes of rock pediment remnants. Slopes are 15 to 75 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 46 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, frigid, shallow Entic Haploxerolls

**Typical pedon:** Nupart very gravelly loamy sand, 50 to 75 percent slopes, in an area of woodland in the Nupart-Lazan-Rock outcrop association:

A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loamy sand, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; 50 percent pebbles; neutral (pH 6.8); clear smooth boundary.

A2—2 to 5 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand, dark brown (10YR 3/3) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; many very fine and fine interstitial pores; 65 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Cr—5 inches; highly weathered granite.

**Type location:** Mineral County, Nevada; in the Wassuk Mountains; about 830 feet north and 1,440 feet east of the southwest corner of sec. 14, T. 7 N., R. 29 E.; 38 degrees, 28 minutes, 37 seconds north latitude and 118 degrees, 43 minutes, 58 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the moisture control section for at least 45 consecutive days after the summer solstice

*Soil temperature:* 43 to 47 degrees F

*Depth to bedrock:* 4 to 10 inches

*Control section:* Clay content—3 to 10 percent; content of rock fragments—averages 35 to 60 percent, mainly 2 to 5 millimeters

*A horizon:*

Value—4 or 5 dry

Chroma—2 or 3 dry or moist

### **Nuyobe Series**

The Nuyobe series consists of very deep, poorly drained soils that formed in lacustrine sediments derived from mixed rock sources and volcanic ash. These soils are on lake plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Nuyobe silty clay loam, 0 to 2 percent slopes, in an area of rangeland in the Nuyobe-Playas association:

**A1**—0 to 3 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate very fine granular structure; soft, very friable, sticky and plastic; common very fine roots; many very fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

**A2**—3 to 6 inches; very pale brown (10YR 8/3) silt loam, brown (10YR 5/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.5); abrupt smooth boundary.

**2C1**—6 to 7 inches; white (10YR 8/1) very fine sandy loam (volcanic ash), light gray (10YR 6/1) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.5); abrupt smooth boundary.

**3C2**—7 to 22 inches; very pale brown (10YR 7/3) silty clay loam, light yellowish brown (10YR 6/4) moist; moderate thin platy structure; hard, very friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

**3Ck1**—22 to 35 inches; white (10YR 8/2) silt loam, pale

brown (10YR 6/3) moist; common distinct brown (7.5YR 5/4 moist) mottles; massive; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; 10 percent 1/2- to 3-centimeter angular lime nodules and common medium soft lime masses; strongly effervescent; strongly alkaline (pH 8.7); gradual smooth boundary.

**3Ck2**—35 to 60 inches; white (10YR 8/2) silt loam, pale brown (10YR 6/3) moist; common distinct brown (7.5YR 5/4 moist) mottles; massive; slightly hard, very friable, sticky and plastic; few very fine and fine roots; common fine tubular pores; 20 percent 1- to 5-centimeter angular lime nodules and common medium soft lime masses; strongly effervescent; strongly alkaline (pH 8.7).

**Type location:** Mineral County, Nevada; approximately 15 miles west of Gabbs; about 1,300 feet east and 1,800 feet south of the northwest corner of sec. 9, T. 12 N., R. 33 E.; 38 degrees, 55 minutes, 24 seconds north latitude and 118 degrees, 17 minutes, 15 seconds west longitude.

#### **Range in Characteristics**

*Soil moisture:* Saturated in some horizons between depths of 24 and 36 inches for a brief period in most years; soil moistened by capillary fringe to within 6 inches of the surface

*Soil temperature:* 53 to 59 degrees F

*Control section:* Texture—stratified very fine sandy loam to silt clay loam, less than 15 percent sand coarser than very fine sand and 18 to 27 percent clay (mixed)

*Sodium adsorption ratio:* Greater than 13, decreases with depth (below 20 inches)

*Carbonates:* Strongly effervescent or violently effervescent

*Hue:* 10YR, 2.5Y, or 5Y

*Value:* 6 to 8 dry, 4 to 6 moist

*Chroma:* 2 to 4; 1 in thin layers of volcanic ash

*A horizon:*

Reaction—strongly alkaline or very strongly alkaline

*C horizon:*

Reaction—moderately alkaline or strongly alkaline

### **Old Camp Series**

The Old Camp series consists of shallow, well drained soils that formed in residuum derived from basalt and other volcanic rocks. These soils are on hills and mountains. Slopes are 30 to 75 percent. Mean

annual precipitation is about 10 inches, and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Old Camp very stony loam, 30 to 50 percent slopes, in an area of rangeland in the Theon-Old Camp association, where pebbles cover about 25 percent of the surface, cobbles about 10 percent, and stones about 5 percent:

A—0 to 3 inches; light brownish gray (10YR 6/2) very stony loam, dark brown (10YR 3/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; common fine roots; common fine and medium vesicular pores; 25 percent pebbles, 10 percent cobbles, 10 percent stones; neutral (pH 7.3); abrupt smooth boundary.

Bt—3 to 5 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; many fine and common medium roots; common fine tubular pores; common thin clay films lining pores; 35 percent pebbles, 25 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary.

Btk—5 to 12 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many fine and common medium roots; common fine and few medium tubular pores; common moderately thick clay films coating faces of peds and lining pores; 20 percent pebbles, 35 percent cobbles; few thin lime coatings on rock fragments and few thin lime filaments in pores; noneffervescent matrix, strongly effervescent in lime coatings and filaments; moderately alkaline (pH 8.2); abrupt irregular boundary.

R—12 inches; fractured andesite bedrock; few thin lime coatings.

**Type location:** Mineral County, Nevada; 150 feet north and 2,600 feet west of the southeast corner of sec. 3, T. 13 N., R. 27 E.; 39 degrees, 0 minutes, 43 seconds north latitude and 118 degrees, 57 minutes, 4 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist from November to May

**Soil temperature:** 47 to 50 degrees F

**Control section:** Content of rock fragments—50 to 75 percent, dominantly cobbles and stones; 35 to 50 percent in the upper part of some pedons

**Depth to bedrock:** 10 to 20 inches

#### A horizon:

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—weak granular, platy, or massive

Reaction—neutral or mildly alkaline

#### B horizon:

Hue—10YR or 7.5YR

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4

Texture—clay loam or sandy clay loam; subhorizons of loam in some pedons, modified by an average of 50 to 75 percent rock fragments

Clay content—27 to 35 percent

Structure—weak or moderate coarse to fine subangular blocky

Reaction—neutral or mildly alkaline in the upper part, moderately alkaline or strongly alkaline in the calcareous lower part

Other features—few to continuous lime coatings on rock fragments or bedrock

### Oricto Series

The Oricto series consists of very deep, well drained soils that formed in mixed alluvium derived from rhyolite, andesite, and granodiorite. These soils are on fan remnants, fan piedmonts, and beach plains. Slopes are 2 to 30 percent. Mean annual precipitation is about 4 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Haplargids

**Typical pedon:** Oricto very gravelly fine sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Oricto-Gynelle-Izo association:

A—0 to 3 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; few fine and very fine roots; many very fine and fine vesicular pores; 35 percent pebbles, 15 percent cobbles; slightly effervescent; strongly alkaline (pH 8.5); abrupt wavy boundary.

Bt—3 to 8 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate coarse and medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few medium and common very fine and fine roots; common very fine tubular pores; 40 percent pebbles, 15 percent cobbles; few thin clay films on

pedes, many thin films in pores; violently effervescent; very strongly alkaline (pH 9.2); abrupt wavy boundary.

- Bk**—8 to 14 inches; pale brown (10YR 6/3) extremely cobbly sandy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; 40 percent pebbles, 25 percent cobbles; common distinct lime pendants on rock fragments; violently effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.
- 2C1**—14 to 26 inches; pale brown (10YR 6/3) extremely gravelly sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial pores; 60 percent pebbles, 5 percent cobbles; violently effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.
- 3C2**—26 to 37 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial pores; 35 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.
- 4C3**—37 to 60 inches; pale brown (10YR 6/3) extremely gravelly coarse sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial pores; 60 percent pebbles, 5 percent cobbles; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Mineral County, Nevada; about ¼ mile north of the old Placer Mine; 2,100 feet south and 500 feet west of the northeast corner of sec. 23, T. 13 N., R. 33 E.; 38 degrees, 58 minutes, 43 seconds north latitude and 118 degrees, 13 minutes, 9 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms; dry in the lower part of the moisture control section

**Soil temperature:** 55 to 59 degrees F

**Depth to bottom of Bt horizon:** 6 to 9 inches

**Control section:** Texture—averages loamy sand or sand; content of rock fragments—35 to 60 percent, mainly pebbles

**Reaction throughout the profile:** Strongly alkaline or very strongly alkaline

**Depth to 2C horizon:** 9 to 19 inches

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Carbonates—slightly effervescent to violently effervescent

Structure—subangular blocky or prismatic

**Bt horizon:**

Value—5 to 7 dry, 4 or 5 moist

Chroma—3 or 4

Rock fragments—35 to 55 percent

Texture of the fraction less than 2 millimeters—loam or sandy clay loam

Clay content—20 to 27 percent

Carbonates—strongly effervescent or violently effervescent

Sodium adsorption ratio—13 or 14

**Bk horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Rock fragments—40 to 70 percent

Texture of the fraction less than 2 millimeters—sandy loam or coarse sandy loam

Structure—massive or subangular blocky

Carbonates—strongly effervescent or violently effervescent

**2C horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—1 to 3

Rock fragments—40 to 70 percent

Texture of the fraction less than 2 millimeters—stratified coarse sand and loamy sand

Carbonates—slightly effervescent to violently effervescent

#### Patna Series

The Patna series consists of very deep, somewhat excessively drained soils that formed in lacustrine and eolian deposits. These soils are on lake-plain terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Typic Haplargids

**Typical pedon:** Patna sand, 0 to 2 percent slopes, in

an area of rangeland in the Patna-Hawsley sands, 0 to 4 percent slopes:

- A—0 to 8 inches; pale brown (10YR 6/3) sand, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 5 percent pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary.
- Bt—8 to 15 inches; pale brown (10YR 6/3) coarse sandy loam, brown (10YR 4/3) moist, with brown (10YR 4/3 moist) lamellae; massive; slightly hard to hard, very friable to friable, slightly sticky and nonplastic; few thin colloidal stains coating sand grains and pores; many thin clay films bridging sand grains; common very fine and fine and few medium roots; many fine interstitial pores; moderately alkaline (pH 8.4); clear wavy boundary.
- Bk1—15 to 18 inches; dark brown (10YR 4/3) loamy sand, dark yellowish brown (10YR 3/4) moist; massive; hard, friable, nonsticky and nonplastic; few very fine and fine roots; many fine interstitial pores; 5 percent pebbles; slightly effervescent to strongly effervescent; calcium carbonate in horizontal seams 1 to 3 millimeters in thickness and lining old root channels extending into the lower horizons; strongly alkaline (pH 8.8); clear wavy boundary.
- Bk2—18 to 36 inches; pale brown (10YR 6/3) loamy sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine to medium roots; many fine interstitial pores; 10 percent pebbles; few thin horizontal seams of calcium carbonate along stratification and few small calcium carbonate masses throughout; slightly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.
- C1—36 to 50 inches; light yellowish brown (2.5Y 6/4) loamy sand, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine interstitial pores; 10 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary.
- C2—50 to 60 inches; light gray (10YR 7/2) loamy sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine interstitial pores; 10 percent pebbles; mildly alkaline (pH 7.4).
- Type location:** Mineral County, Nevada; 1,700 feet east and 350 feet south of the northwest corner of sec. 20, T. 13 N., R. 29 E.; 38 degrees, 58 minutes, 52 seconds north latitude and 118 degrees, 46 minutes, 5 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods in winter and early spring

*Soil temperature:* 53 to 57 degrees F

*Control section:* Clay content—10 to 18 percent

#### A horizon:

Value—5 to 7 dry, 3 or 4 moist

Chroma—1 to 3

Reaction—neutral or mildly alkaline

#### Bt horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Reaction—neutral or mildly alkaline

Other features—1 to 10 percent continuous heavy lamellae of sandy loam or sandy clay loam 3 to 50 millimeters thick in the argillic horizon; lamellae commonly 1 unit of chroma brighter and with 1 to 3 percent more clay than the interlamellae areas

#### C and Ck horizons:

Value—4 to 7 dry, 3 to 5 moist

Chroma—2 or 3 (may be 4 in the upper part)

Texture—loamy fine sand to coarse sand

Other features—unconformable silty lake sediments below a depth of 40 inches in some pedons; no Ck horizon in some pedons

Reaction—mildly alkaline or moderately alkaline

### Pedee Variant

The Pedee Variant consists of deep, well drained soils that formed primarily in residuum and alluvium derived from andesitic rock with some mixing from granitic rock and volcanic ash (pumice). These soils are on alluvial fan piedmonts and mountain toe slopes. Slopes are 2 to 15 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Clayey-skeletal, mixed, frigid Mollic Palexeralfs

**Reference pedon:** Pedee Variant sand, in an area of rangeland where pebbles cover about 10 percent of the surface:

A—0 to 3 inches; light brownish gray (10YR 6/2) sand, very dark brown (10YR 2/2) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; slightly acid (pH 6.4); abrupt smooth boundary.

AB—3 to 9 inches; pale brown (10YR 6/3) sandy clay

loam, very dark grayish brown (10YR 3/2) moist; massive; soft, friable, sticky and plastic; many very fine and fine roots; common very fine and fine interstitial pores; slightly acid (pH 6.4); abrupt smooth boundary.

**Bt1**—9 to 16 inches; yellowish brown (10YR 5/4) gravelly clay, brown (10YR 4/3) moist; strong fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; common very fine roots; common very fine and fine interstitial pores; many thick clay films on faces of peds and in pores; 30 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

**Bt2**—16 to 29 inches; brown (10YR 5/3) very gravelly clay, dark brown (10YR 4/3) moist; strong fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots; common very fine and fine interstitial pores; many thick clay films on faces of peds; 60 percent pebbles; neutral (pH 6.6); abrupt wavy boundary.

**BC**—29 to 44 inches; yellowish brown (10YR 5/4) extremely gravelly clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, sticky and plastic; few fine roots; common fine and medium interstitial pores; 75 percent pebbles; neutral (pH 6.6).

**Type location:** Mineral County, Nevada; approximately 26 miles southeast of Hawthorne; about 1,200 feet north and 600 feet east of the southwest corner of sec. 23, T. 6 N., R. 30 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 47 degrees F

**Bt horizon:**

Rock fragments—35 to 60 percent pebbles

Clay content—40 to 50 percent clay

### Penelas Series

The Penelas series consists of very shallow, well drained soils that formed in residuum and colluvium derived from shale. These soils are on mountain slopes and hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Penelas very channery loam, 15 to 50 percent slopes, in an area of rangeland in the Rodad-Penelas-Blacktop association:

**A**—0 to 7 inches; pale brown (10YR 6/3) very channery loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few fine and common very fine roots; few very fine vesicular and common very fine interstitial pores; 55 percent channers; mildly alkaline (pH 7.6); clear smooth boundary.

**Bt**—7 to 12 inches; pale brown (10YR 6/3) extremely shaly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; few very fine interstitial and common very fine tubular pores; 70 percent pebble-size hard shale fragments; common thin clay films on faces of peds; mildly alkaline (pH 7.4); clear wavy boundary.

**Cr**—12 inches; very fractured shale.

**Type location:** Mineral County, Nevada; 200 feet north and 500 feet east of the southwest corner of sec. 10, T. 3 N., R. 34 E.; 38 degrees, 7 minutes, 24 seconds north latitude and 118 degrees, 11 minutes, 27 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and early spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture of the fraction less than 2 millimeters—dominantly loam or clay loam (mixed); clay content—20 to 30 percent; content of rock fragments—60 to 75 percent, mainly channery or flaggy fragments

**Depth to soft bedrock:** 5 to 14 inches

**Reaction throughout the profile:** Mildly alkaline to strongly alkaline

**Carbonates:** Commonly noncalcareous, but slightly effervescent in the A horizon in some pedons; some lime coating the shale rocks in some pedons

**A horizon:**

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 to 5 moist

Chroma—2 to 4

Structure—massive or very thin to thick platy

**Bt horizon:**

Hue—10YR or 7.5YR

Value—4 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—massive or moderate to strong very fine to medium angular or subangular blocky

Texture of the fraction less than 2 millimeters—clay loam with less than 35 percent clay and less than 35 percent sand

*Cr horizon:*

Bedrock—generally platy, but massive in some pedons

### **Perazzo Series**

The Perazzo series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on fan aprons and fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Haplargids

**Typical pedon:** Perazzo very gravelly sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Deefan-Perazzo association:

A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; many very fine and fine interstitial pores; 35 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary.

A2—2 to 6 inches; light brownish gray (10YR 6/2) very gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular pores; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); abrupt smooth boundary.

Bt1—6 to 9 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many very fine tubular and common fine interstitial pores; few thin clay films on faces of peds; common thin clay films lining pores; 20 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

Bt2—9 to 15 inches; yellowish brown (10YR 5/4) very

gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine and fine interstitial and common fine tubular pores; common moderately thick and thin clay films lining pores and coating faces of peds; 45 percent pebbles, 5 percent cobbles; neutral (pH 6.8); clear smooth boundary.

C—15 to 20 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 60 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary.

Ck—20 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; many very fine interstitial pores; 60 percent pebbles, 5 percent cobbles; few thin lime pendants on rock fragments; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; about 2,630 feet east and 2,100 feet north of the southwest corner of sec. 20, T. 13 N., R. 27 E.; 38 degrees, 58 minutes, 20 seconds north latitude and 118 degrees, 58 minutes, 48 seconds west longitude.

#### **Range in Characteristics**

*Soil moisture:* Usually dry; moist for short periods in winter and spring

*Soil temperature:* 53 to 59 degrees F

*Combined thickness of A and Bt horizons:* 10 to 20 inches

*Control section:* Clay content—20 to 30 percent; content of rock fragments—35 to 50 percent, mainly pebbles; texture—very gravelly sandy clay loam or very gravelly clay loam

*A horizon:*

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 or 3

Structure—platy, subangular blocky, or massive

*Bt horizon:*

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 to 5 moist

Chroma—3 or 4

Texture of the fraction less than 2 millimeters—sandy clay loam or clay loam

Rock fragments—15 to 35 percent in the upper part,

45 to 60 percent in the lower part, mainly pebbles

Structure—subangular blocky or massive

Reaction—slightly acid to mildly alkaline; effervescent in the lower subhorizon in some pedons

Exchangeable sodium—less than 15 percent in the A and Bt horizons

Other features—a Btk horizon in some pedons

*C and Ck horizons:*

Hue—10YR or 7.5YR

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 to 4

Texture—extremely gravelly sandy loam or extremely gravelly loam in the upper part; extremely gravelly sand or extremely gravelly loamy sand in the lower part, below a depth of 20 inches

Reaction—neutral or mildly alkaline in the upper part; moderately alkaline to very strongly alkaline in the lower part

### ***Petspring Series***

The Petspring series consists of very shallow, well drained soils that formed in residuum and colluvium derived from highly weathered granodiorite. These soils are on mountains, hills, and pediments. Slopes are 15 to 75 percent. Mean annual precipitation is about 8 to 10 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, nonacid, mesic, shallow Xeric Torriorthents

**Typical pedon:** Petspring very gravelly coarse sandy loam, 50 to 75 percent slopes, in an area of rangeland in the Petspring-Rock outcrop-Budihol association:

A1—0 to 1 inch; brown (10YR 5/3) very gravelly coarse sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; very few very fine roots; few very fine tubular pores; 55 percent pebbles; neutral (pH 6.8); clear smooth boundary.

A2—1 to 3 inches; brown (10YR 5/3) very gravelly coarse sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; very few very fine roots; few very fine tubular pores; 45 percent pebbles; neutral (pH 6.8); abrupt wavy boundary.

Cr—3 inches; highly weathered granite.

**Type location:** Mineral County, Nevada; in the Gabbs Valley Range; about 2,600 feet north and 2,600 feet west of the southeast corner of sec. 29, T. 9 N., R. 34 E.; 38 degrees, 37 minutes, 36 seconds north latitude and 118 degrees, 13 minutes, 46 seconds west longitude.

#### **Range in Characteristics**

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 54 to 59 degrees F

*Control section:* Clay content—10 to 18 percent; content of rock fragments—35 to 55 percent, predominantly 2- to 5-millimeter pebbles

*Depth to weathered bedrock:* 3 to 10 inches

*Depth to unweathered bedrock:* 20 to 30 inches

*Reaction throughout the profile:* Slightly acid or neutral

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4 dry or moist

### ***Pintwater Series***

The Pintwater series consists of shallow, well drained soils that formed in residuum and colluvium derived from volcanic rocks. These soils are on mountains, rock pediments, and hills. Slopes are 4 to 50 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents

**Typical pedon:** Pintwater very gravelly fine sandy loam, 15 to 50 percent slopes, in an area of rangeland in the Pintwater-Blacktop-Rock outcrop association:

A1—0 to 2 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial and few very fine vesicular pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

A2—2 to 6 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate thin and medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine vesicular and few very fine interstitial pores; 45 percent pebbles; strongly effervescent; moderately alkaline (pH 7.9); clear wavy boundary.

Bkq—6 to 11 inches; very pale brown (10YR 7/3)

extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial and few very fine tubular pores; 65 percent pebbles; few thin lime and silica coatings on bottoms of pebbles; few thin lime and silica coatings on bottoms of pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

R—11 inches; hard, welded rhyolitic tuff.

**Type location:** Mineral County, Nevada; about 800 feet west and 800 feet north of the southeast corner of sec. 20, T. 4 N., R. 35 E.; 38 degrees, 10 minutes, 58 seconds north latitude and 118 degrees, 5 minutes, 59 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Control section:** Texture—fine sandy loam or sandy loam; clay content—10 to 18 percent; content of rock fragments—35 to 70 percent

**Depth to bedrock:** 10 to 20 inches

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

#### A horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 or 3

Structure—platy, subangular blocky, or massive

Carbonates—slightly effervescent to strongly effervescent

#### Bkq horizon:

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Texture—fine sandy loam or sandy loam

Rock fragments—45 to 70 percent stones, cobbles, and pebbles

Carbonates—lime pendants or coatings on rock fragments or soft masses and filaments of lime; strongly effervescent or violently effervescent

Other features—accessory silica pendants or coatings in some pedons

### Powment Series

The Powment series consists of very shallow, somewhat excessively drained soils that formed in colluvium and residuum derived from granitic rock

sources. These soils are on mountain slopes. Slopes are 50 to 75 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, frigid, shallow  
Typic Xerorthents

**Typical pedon:** Powment very gravelly sand, 50 to 75 percent slopes, in an area of rangeland in the Lazan Family-Powment association, where gravel pavement covers about 70 percent of the surface:

A—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly sand, very dark grayish brown (10YR 3/2) moist; single grained; loose, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 50 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.

C1—2 to 6 inches; pale brown (10YR 6/3) extremely gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 80 percent pebbles; neutral (pH 6.8); clear smooth boundary.

C2—6 to 10 inches; pale brown (10YR 6/3) extremely gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 80 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.

Cr—10 inches; highly fractured granitic and weathered bedrock (gruss).

**Type location:** Mineral County, Nevada; approximately 15 miles south of Hawthorne; about 2,200 feet east of the southwest corner on the section line of sec. 33, T. 6 N., R. 30 E.; 38 degrees, 19 minutes, 45 seconds north latitude and 118 degrees, 33 minutes, 29 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from mid-July to October

**Soil temperature:** 44 to 47 degrees F

**Depth to weathered bedrock:** 4 to 14 inches

**Control section:** Texture—averages very gravelly sand or extremely gravelly sand; content of rock fragments—averages 50 to 80 percent pebbles

**Reaction throughout the profile:** Slightly acid or neutral

#### C horizon:

Texture—very gravelly sand or extremely gravelly sand

Rock fragments—50 to 80 percent pebbles

Clay content—0 to 10 percent

Other features—a grass-like C2 horizon in some pedons

### **Pumel Series**

The Pumel series consists of very shallow, well drained soils that formed in residuum and colluvium derived from granodiorite. These soils are on mountains and hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic, shallow Typic Torriorthents

**Typical pedon:** Pumel very gravelly sandy loam, 30 to 50 percent slopes, in an area of rangeland in the Uripnes-Pumel-Rock outcrop association:

A—0 to 1 inch; light brownish gray (10YR 6/2) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; many very fine vesicular and few very fine interstitial pores; 50 percent pebbles, 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C—1 to 4 inches; light brownish gray (10YR 6/2) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 65 percent pebbles, 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

Cr—4 inches; weathered bedrock; thin lime coatings and common very fine roots in fractures.

**Type location:** Mineral County, Nevada; about 1,750 feet east and 625 feet north of the southwest corner of sec. 34, T. 7 N., R. 34 E.; 38 degrees, 26 minutes, 0 seconds north latitude and 118 degrees, 10 minutes, 56 seconds west longitude.

#### **Range in Characteristics**

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture—sandy loam or coarse sandy loam; content of rock fragments—50 to 70 percent, predominantly pebbles

**Depth to soft bedrock:** 4 to 14 inches

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Carbonates:** Strongly effervescent or violently effervescent

**A horizon:**

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—platy, granular, or massive

**C horizon:**

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Texture—sandy loam or coarse sandy loam

Clay content—8 to 15 percent

Rock fragments—50 to 70 percent, dominantly pebbles

Structure—platy, granular, or massive

### **Rattleflat Series**

The Rattleflat series consists of very deep, well drained soils that formed in alluvium derived predominantly from granitic rock. These soils are on fan piedmont remnants. Slopes are 2 to 15 percent. Mean annual precipitation is about 8 to 12 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Xerollic Haplargids

**Typical pedon:** Rattleflat gravelly loamy sand, 2 to 15 percent slopes, in an area of rangeland in the Rattleflat-Crunker association:

A1—0 to 3 inches; light brownish gray (10YR 6/2) gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial and few very fine tubular pores; 15 percent pebbles; neutral (pH 6.8); clear smooth boundary.

A2—3 to 9 inches; pale brown (10YR 6/3) gravelly loamy sand, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial and few very fine tubular pores; 15 percent pebbles; neutral (pH 6.8); clear wavy boundary.

Bt—9 to 18 inches; light yellowish brown (10YR 6/4)

gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine tubular and few very fine interstitial pores; 20 percent pebbles; few thin clay films on faces of peds; neutral (pH 6.8); clear wavy boundary.

**Btq**—18 to 22 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial pores; 30 percent pebbles; 20 percent weak ½- to 2-inch silica durinodes and discontinuous weak silica cementation; few thin clay films on faces of peds; neutral (pH 6.6); clear wavy boundary.

**2C1**—22 to 32 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, dark brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial pores; 40 percent pebbles; neutral (pH 6.8); clear wavy boundary.

**2C2**—32 to 60 inches; pale brown (10YR 6/3) very gravelly coarse sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and few fine roots; many very fine and few fine interstitial pores; 60 percent pebbles; 15 percent weak ½- to 2-inch silica durinodes; neutral (pH 7.0).

**Type location:** Mineral County, Nevada; in Rattlesnake Flat; about 100 feet south and 150 feet west of the northeast corner of sec. 7, T. 5 N., R. 32 E.; 38 degrees, 18 minutes, 47 seconds north latitude and 118 degrees, 27 minutes, 15 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 54 to 59 degrees F

**Control section:** Texture of the fraction less than 2 millimeters—sandy loam or coarse sandy loam; clay content—averages 10 to 18 percent; content of rock fragments—averages 15 to 35 percent, predominantly 2- to 5-millimeter angular pebbles

**Depth to unconformable 2C horizon:** 15 to 30 inches

**A horizon:**

Value—dominantly 6 dry and 4 moist, but may be 5 dry and 3 moist in the upper 2 or 3 inches  
Chroma—2 or 3

**Bt horizon:**

Chroma—3 or 4 dry or moist  
Rock fragments—15 to 35 percent, predominantly 2- to 5-millimeter pebbles

**Btq horizon:**

Cementation—weak to strong durinodes or weak to strong discontinuous silica cementation

**2C horizon:**

Value—4 or 5 moist  
Chroma—2 or 3  
Texture of the fraction less than 2 millimeters—stratified loamy sand to coarse sand  
Rock fragments—35 to 60 percent, predominantly 2- to 5-millimeter pebbles  
Cementation—as much as 15 percent durinodes or weak discontinuous silica cementation; no cementation in some pedons  
Reaction—neutral or mildly alkaline

### Ratto Family

The Ratto Family consists of shallow, well drained soils that formed in alluvium, colluvium, and residuum derived from mixed rock sources. These soils are on alluvial fan piedmonts and plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 10 to 12 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, frigid, shallow Xerollic Durargids

**Reference pedon:** Ratto Family, gravelly sand, in an area of rangeland:

**A**—0 to 3 inches; light brownish gray (10YR 6/2) gravelly sand, dark brown (10YR 3/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 25 percent pebbles, 5 percent cobbles; slightly acid (pH 6.4); abrupt smooth boundary.

**Bt1**—3 to 8 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; moderate medium angular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; many very fine and fine interstitial pores; common thin clay films on faces of peds; slightly acid (pH 6.4); abrupt smooth boundary.

**Bt2**—8 to 13 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; strong fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine

roots; many very fine and medium interstitial pores; common thin clay films on faces of peds; 5 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

**Bt3**—13 to 18 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; strong fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; few medium roots; common very fine interstitial pores; common thin clay films on faces of peds; 10 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

**Bqm**—18 inches; indurated duripan.

**Type location:** Mineral County, Nevada; approximately 21 miles south of Hawthorne; about 1,000 feet east and 1,000 feet south of the northwest corner of sec. 1, T. 4. N., R. 30 E.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from early July to October

*Soil temperature:* 44 to 47 degrees F

*Depth to indurated duripan:* 14 to 20 inches

*Bt horizon:*

Clay content—40 to 50 percent

Rock fragments—5 to 15 percent pebbles

### Ravenell Series

The Ravenell series consists of very shallow, well drained, slowly permeable soils that formed in residuum derived from Tertiary sediments and alluvium derived from mixed igneous rocks. These soils are on pediments of dissected Tertiary sediments. Slopes are 4 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is 48 to 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Ravenell very gravelly loam, 15 to 30 percent slopes, in an area of rangeland in the Ravenell-Haar-Rock outcrop association:

**A1**—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine vesicular pores; 30 percent pebbles, 10 percent cobbles; neutral (pH 6.6); abrupt smooth boundary.

**A2**—2 to 5 inches; light brownish gray (10YR 6/2) very

gravelly sandy loam, dark grayish brown (10YR 4/2) moist; strong coarse platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many very fine and fine vesicular pores; 35 percent pebbles, 10 percent cobbles; neutral (pH 6.8); clear smooth boundary.

**Bt**—5 to 12 inches; brown (10YR 4/3 dry and moist) very gravelly clay; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; many very fine and common fine and medium roots; common very fine tubular pores; many moderately thick clay films lining pores and coating faces of peds; 35 percent pebbles, 15 percent cobbles; neutral (pH 6.6); clear wavy boundary.

**2Cr**—12 inches; weathered stratified mudstone and sandstone; few roots in the upper part.

**Type location:** Mineral County, Nevada; ¼ mile east of Highway 3C; about 50 feet north and 1,200 feet east of the southwest corner of sec. 6, T. 7 N., R. 28 E.; 38 degrees, 29 minutes, 43 seconds north latitude and 119 degrees, 1 minute, 29 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 57 degrees F

*Thickness of the solum:* 6 to 14 inches

*Control section:* Clay content—25 to 35 percent; content of rock fragments—35 to 60 percent, mostly pebbles

*Depth to paralithic contact:* 6 to 14 inches

*Reaction throughout the profile:* Neutral or mildly alkaline

*A horizon:*

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Rock fragments—35 to 60 percent, mostly pebbles

Structure—granular or subangular blocky

*Bt horizon:*

Hue—7.5YR or 10YR

Value—4 to 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—very gravelly clay or very gravelly sandy clay

Clay content—35 to 45 percent

*Cr horizon:*

Texture—weakly consolidated sandstone, siltstone, mudstone, or conglomerate

## Ravenswood Series

The Ravenswood series consists of moderately deep, well drained soils that formed in colluvium and residuum derived from volcanic and metavolcanic rocks. These soils are on mountain side slopes. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, frigid Typic Argixerolls

**Typical pedon:** Ravenswood very stony loam, 15 to 50 percent slopes, in an area of woodland in the Ravenswood-Brier-Itca association, where pebbles cover about 20 percent of the surface, cobbles about 20 percent, and stones about 8 percent:

- A1—0 to 3 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; many very fine roots; common very fine interstitial pores; 15 percent pebbles, 10 percent cobbles, 5 percent stones; neutral (pH 6.6); clear smooth boundary.
- A2—3 to 10 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; few very fine interstitial and common very fine tubular pores; 15 percent pebbles, 10 percent cobbles, 5 percent stones; neutral (pH 6.6); clear wavy boundary.
- Bt1—10 to 13 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; 50 percent pebbles, 5 percent cobbles; common moderately thick pressure faces; neutral (pH 6.8); clear wavy boundary.
- Bt2—13 to 21 inches; light yellowish brown (10YR 6/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; very hard, friable, very sticky and very plastic; common very fine to coarse roots; common very fine tubular pores; 45 percent pebbles, 5 percent cobbles; continuous thick pressure faces; neutral (pH 6.8); clear wavy boundary.
- Bt3—21 to 30 inches; light yellowish brown (10YR 6/4) very gravelly clay, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; very hard, friable, very sticky and very plastic; common very fine to coarse roots; common very fine tubular

pores; 35 percent pebbles, 5 percent cobbles; continuous thick pressure faces; neutral (pH 6.8); clear wavy boundary.

R—30 inches; hard, altered volcanic bedrock.

**Type location:** Mineral County, Nevada; approximately 2 miles southeast of Montgomery Pass; about 100 feet south and 400 feet west of the northeast corner of sec. 9, T. 1 N., R. 33 E.; 37 degrees, 57 minutes, 44 seconds north latitude and 118 degrees, 18 minutes, 0 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry for 45 to 90 consecutive days from mid-July to October

**Soil temperature:** 43 to 47 degrees F, greater than 41 degrees F from May to November

**Thickness of the mollic epipedon:** 10 to 16 inches; includes the upper part of the argillic horizon

**Thickness of the solum and depth to unweathered bedrock:** 30 to 40 inches

**Control section:** Clay content—35 to 50 percent; content of rock fragments—35 to 60 percent, mainly pebbles and cobbles

**Reaction throughout the profile:** Slightly acid to mildly alkaline, increasing with depth

**A horizon:**

Value—4 or 5 dry, 2 or 3 moist  
Chroma—2 or 3

**Bt horizon:**

Hue—10YR or 7.5YR

Value—5 dry in the upper part, 5 or 6 dry in the lower part; 3 moist in the upper part, 3 to 5 moist in the lower part

Chroma—3 in the upper part, 3 to 6 in the lower part

Texture—very gravelly clay loam in the upper Bt horizon; very gravelly clay or very gravelly clay loam in the lower subhorizons

Structure—angular blocky in the upper part, angular blocky or prismatic in the lower part

## Rawe Series

The Rawe series consists of very deep, well drained soils that formed in mixed alluvium. These soils are on fan piedmonts. Slopes are 2 to 15 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Clayey over loamy-skeletal, montmorillonitic, mesic Typic Haplargids

**Typical pedon:** Rawe gravelly sandy loam, 2 to 15 percent slopes, in an area of rangeland in the Rawe-Bluewing-Trocken association:

A1—0 to 2 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common fine and very fine interstitial pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

A2—2 to 4 inches; light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine tubular and common medium, fine, and very fine interstitial pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

Bt1—4 to 8 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, very sticky and very plastic; common medium and fine roots; common fine and very fine tubular pores; 10 percent pebbles; many moderately thick clay films on faces of peds and in pores; mildly alkaline (pH 7.6); abrupt wavy boundary.

Btk—8 to 11 inches; brown (7.5YR 5/4) gravelly clay, dark brown (7.5YR 4/4) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, sticky and plastic; common medium and many fine and very fine roots; common medium and fine tubular pores; 15 percent pebbles; many moderately thick clay films on faces of peds and in pores; common distinct white (10YR 8/2) lime pendants on the lower faces of peds throughout and in masses in the lower part of the horizon; slightly effervescent; moderately alkaline (pH 7.9); abrupt wavy boundary.

2Bk1—11 to 27 inches; light gray (10YR 7/2) very gravelly coarse sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many medium, fine, and very fine roots; many fine and very fine interstitial pores; 40 percent pebbles; common distinct lime and silica pendants on lower surface of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Bk2—27 to 39 inches; pale brown (10YR 6/3) very

gravelly coarse sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; many fine and very fine interstitial pores; 45 percent pebbles; common distinct lime pendants on lower surface of rock fragments; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

2Bk3—39 to 45 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and medium roots; many very fine and fine interstitial pores; 55 percent pebbles; common distinct lime pendants on lower surface of rock fragments; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

2Bk4—45 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and medium roots; many very fine and fine interstitial pores; 50 percent pebbles; lime coating rock fragments; slightly effervescent; moderately alkaline (pH 8.0).

**Type location:** Mineral County, Nevada; about 2,000 feet west and 700 feet north of the southeast corner of sec. 35, T. 14 N., R. 27 E.; 39 degrees, 1 minute, 37 seconds north latitude and 119 degrees, 4 minutes, 21 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods in winter and spring

*Soil temperature:* 53 to 59 degrees F

*Depth to 2Bk horizon:* 10 to 23 inches

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—1 to 3

Rock fragments—0 to 30 percent, mainly pebbles

Structure—platy or subangular blocky

Reaction—neutral to moderately alkaline

Other features—pebble mulch or desert pavement common on the surface

*Bt horizon:*

Hue—7.5YR or 10YR

Value—4 to 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly clay or clay (mixed)

Clay content—40 to 50 percent

Rock fragments—5 to 25 percent pebbles

Structure—angular blocky, subangular blocky, or prismatic

Clay films—common to continuous and thin to thick  
 Reaction—neutral to moderately alkaline  
 Sodium adsorption ratio—less than 13

**2Bk horizon:**

Value—6 or 7 dry, 4 or 5 moist  
 Chroma—2 to 4  
 Texture—very gravelly or extremely gravelly sandy loam or coarse sandy loam, with lenses of very gravelly loamy sand in some pedons  
 Rock fragments—35 to 80 percent, mostly pebbles; common lime coatings on rock fragments

**Rednik Series**

The Rednik series consists of very deep, well drained soils that formed in mixed alluvium. These soils are on fan piedmont remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Haplargids

**Typical pedon:** Rednik very gravelly sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Rednik-Trocken-Bluewing association:

A1—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few fine vesicular and many very fine and fine tubular pores; 35 percent pebbles; effervescent; moderately alkaline (pH 8.3); abrupt smooth boundary.

A2—2 to 6 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots; few fine tubular and many very fine and fine interstitial pores; 35 percent pebbles; effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Btn—6 to 11 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine and medium roots; many very fine tubular pores; 40 percent pebbles; thin discontinuous lime pendants on pebbles in the lower part of the horizon; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bk1—11 to 16 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; many very fine interstitial pores; 45 percent pebbles, 5 percent cobbles; few thin lime pendants on coarse fragments; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

Bk2—16 to 60 inches; pale brown (10YR 6/3) stratified extremely gravelly sand and very gravelly sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; 55 percent pebbles, 5 percent cobbles; few thin lenses of soft disseminated lime; violently effervescent; very strongly alkaline (pH 9.4).

**Type location:** Mineral County, Nevada; about 100 feet west and 400 feet north of the southeast corner of sec. 31, T. 14 N., R. 32 E.; 39 degrees, 0 minutes, 52 seconds north latitude and 118 degrees, 23 minutes, 18 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist for short periods from November to early May

**Soil temperature:** 50 to 54 degrees F

**Thickness of A and Btn horizons:** 11 to 30 inches

**Control section:** Clay content—18 to 27 percent (mixed); content of rock fragments—35 to 75 percent, mainly pebbles

**A horizon:**

Hue—2.5Y or 10YR

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Structure—weak or moderate thin to thick platy or fine to coarse subangular blocky

Consistence—soft or slightly hard (dry)

Reaction—mildly alkaline to strongly alkaline

**Btn horizon:**

Value—5 or 6 dry, 4 or 5 moist

Texture—very gravelly sandy clay loam, very gravelly sandy loam, extremely gravelly loam, or very gravelly loam

Structure—massive or moderate or strong medium or fine angular or subangular blocky

Reaction—moderately alkaline or strongly alkaline

Exchangeable sodium—15 to 30 percent in some part

Carbonates—strongly effervescent or violently effervescent

*Bk and C horizons:*

Hue—10YR or 7.5YR

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Texture—very gravelly fine sandy loam, very gravelly sandy loam, extremely gravelly loamy sand, or very gravelly sand

Rock fragments—35 to 75 percent, mainly pebbles

Reaction—strongly alkaline or very strongly alkaline

Carbonates—strongly effervescent or violently effervescent

**Reese Family**

The Reese Family consists of deep, poorly drained soils that formed in alluvium derived from mixed rock sources. These soils are on flood plains. Slopes are 0 to 2 percent. Mean annual precipitation is 10 to 14 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed (calcareous), mesic Aeric Halaquepts

**Reference pedon:** Reese Family, loamy sand, in an area of rangeland:

A1—0 to 3 inches; pale brown (10YR 6/3) loamy sand, light brownish gray (10YR 6/2) moist; massive; very soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

A2—3 to 6 inches; very pale brown (10YR 7/3) loamy sand, brown (10YR 5/3) moist; massive; very soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

A3—6 to 9 inches; very pale brown (10YR 7/3) loamy sand, brown (10YR 5/3) moist; massive; very soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

2C1—9 to 17 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; strong very fine and fine platy structure; hard, friable, very sticky and very plastic; few fine roots; common very fine interstitial pores; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

2C2—17 to 22 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; weak very fine platy

structure; hard, friable, sticky and plastic; few fine roots; common very fine interstitial pores; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

2C3—22 to 27 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; strong very fine subangular blocky structure; hard, friable, sticky and plastic; few fine roots; common fine interstitial pores; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

3C4—27 to 34 inches; pale brown (10YR 6/3) sandy loam, grayish brown (10YR 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few roots; common fine interstitial pores; 25 percent hard and friable durinodes; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

4C5—34 to 60 inches; pale brown (10YR 6/3) loamy sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; strongly effervescent; very strongly alkaline (pH 9.6).

**Type location:** Mineral County, Nevada; approximately 22 miles south of Hawthorne; about 1,300 feet east and 500 feet south of the northwest corner of sec. 21, T. 5 N., R. 29 E.

**Range in Characteristics**

*Soil moisture:* Moist in winter and spring, remains moist throughout the growing season; water table at 2 to 3 feet from January to August

*Soil temperature:* 47 to 50 degrees F

*Control section:* Clay content—18 to 27 percent; SAR—more than 13 throughout the profile

*C horizon:*

Texture—stratified silty clay loam, sandy loam, and loamy sand

**Rockabin Series**

The Rockabin series consists of moderately deep, well drained soils that formed in residuum and colluvium derived from granitic rock. These soils are on mountains. Slopes are 15 to 75 percent. Mean annual precipitation is about 13 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Typic Cryoborolls

**Typical pedon:** Rockabin very gravelly coarse sandy loam, 15 to 30 percent slopes, in an area of rangeland in the Rockabin-Hiridge association,

where pebbles cover about 30 percent of the surface, cobbles about 15 percent, and stones about 5 percent:

- A1**—0 to 2 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 60 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.
- A2**—2 to 8 inches; brown (10YR 5/3) very gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common very fine interstitial pores; 60 percent pebbles; neutral (pH 6.6); clear smooth boundary.
- C1**—8 to 17 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular and few very fine interstitial pores; 55 percent pebbles; neutral (pH 6.6); clear smooth boundary.
- C2**—17 to 21 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular and few very fine interstitial pores; 70 percent pebbles; neutral (pH 6.7); abrupt wavy boundary.
- Cr**—21 inches; fractured, altered granite bedrock.

**Type location:** Mineral County, Nevada; in the Wassuk range; about 2,400 feet north and 1,900 feet east of the southwest corner of sec. 22, T. 11 N., R. 28 E.; 38 degrees, 47 minutes, 58 seconds north latitude and 118 degrees, 50 minutes, 40 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 47 degrees F

**Average summer soil temperature:** 54 to 59 degrees F

**Thickness of the mollic epipedon:** 8 to 14 inches

**Depth to weathered bedrock:** 20 to 40 inches

**Control section:** Clay content—10 to 18 percent; content of rock fragments—averages 35 to 60 percent

pebbles (more than 50 percent 2 to 5 millimeters in size), as much as 70 percent pebbles in individual horizons; texture of the sand fraction—dominantly coarse sand

#### A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3 dry or moist

Reaction—slightly acid or neutral

#### C horizon:

Value—5 or 6 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

### Rodad Series

The Rodad series consists of very shallow, well drained soils that formed in residuum and colluvium derived from sedimentary rocks. These soils are on hills and mountain slopes. Slopes are 15 to 50 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Haplargids

**Typical pedon:** Rodad very channery loam, 15 to 50 percent slopes, in an area of rangeland in the Rodad-Penelas-Blacktop association:

- A1**—0 to 1 inch; very pale brown (10YR 7/3) very channery loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial and few very fine vesicular pores; 55 percent channers; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- A2**—1 to 3 inches; very pale brown (10YR 7/3) very channery loam, brown (10YR 5/3) moist; weak medium platy structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine interstitial and few very fine vesicular pores; 40 percent channers; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Bt1**—3 to 8 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine and few fine roots; common very fine tubular pores; 40 percent pebbles; common thin clay films on faces of peds; few thin lime pendants on rock fragments; strongly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.
- Bt2**—8 to 14 inches; light yellowish brown (10YR 6/4)

very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; 50 percent pebbles; few thin clay films on faces of peds; common thin lime pendants on rock fragments; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Cr—14 inches; highly fractured shale.

**Type location:** Mineral County, Nevada; about 1,600 feet south and 1,250 feet east of the northwest corner of sec. 13, T. 3 N., R. 34 E.; 38 degrees, 7 minutes, 10 seconds north latitude and 118 degrees, 8 minutes, 49 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Depth to soft bedrock:* 4 to 14 inches

*Control section:* Clay content—27 to 35 percent; content of rock fragments—35 to 60 percent, mainly channers and angular pebbles

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

*Carbonates:* Slightly effervescent to violently effervescent

#### A horizon:

Hue—10YR or 7.5YR

Value—5 to 7 dry, 4 or 5 moist

Chroma—3 or 4

#### Bt horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 to 6

Rock fragments—35 to 60 percent

Clay content—30 to 40 percent

Texture of the fraction less than 2 millimeters—

averages clay loam; clay subhorizons common

Structure—subangular blocky or granular

Other features—rock structure commonly retained in the lower part; lime and silica pendants in some pedons

### Roic Series

The Roic series consists of very shallow, well drained soils that formed in residuum derived from tuffaceous

sandstone, shale, and other hard lacustrine materials. These soils are on rock pediments and hills. Slopes are 4 to 50 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents

**Typical pedon:** Roic loamy sand, 4 to 30 percent slopes, in an area of rangeland in the Roic-Roic, dry-Badland association:

A—0 to 3 inches; light gray (10YR 7/2) loamy sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

C—3 to 10 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial and few very fine tubular pores; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

Cr1—10 to 14 inches; very fractured platy sandstone; hard, firm; strongly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

Cr2—14 to 22 inches; more consolidated platy sandstone with 5 to 10 percent snail shells; very hard, very firm.

**Type location:** Mineral County, Nevada; at the north end of Stewart Valley; about 500 feet south and 2,400 feet west of the northeast corner of sec. 16, T. 9 N., R. 36 E.; 38 degrees, 38 minutes, 39 seconds north latitude and 117 degrees, 58 minutes, 25 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 57 degrees F

*Depth to paralithic contact:* 4 to 14 inches

*Soil profile:* Hue—7.5YR, 10YR, or 2.5Y; value—6 or 7 dry, 4 or 5 moist; chroma—2 to 4

*Control section:* Texture of the fraction less than 2 millimeters—fine sandy loam, very fine sandy loam, or loam with less than 18 percent clay

*Carbonates:* Noneffervescent to strongly effervescent

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

**Other features:** Very firm or extremely firm lacustrine material (hardness of less than 3); may be dug with difficulty with a spade when moist

**A horizon:**

Structure—platy or massive

**C horizon:**

Texture—fine sandy loam or loam

### Rowel Series

The Rowel series consists of shallow, well drained soils that formed in residuum derived from volcanic rocks. These soils are on hills, mountains, and side slopes of plateaus. Slopes are 8 to 50 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Rowel very cobbly sandy loam, 15 to 50 percent slopes, in an area of rangeland in the Loomer-Rowel-Downeyville association:

**A1**—0 to 2 inches; light brownish gray (10YR 6/2) extremely cobbly sandy loamy, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 25 percent pebbles, 30 percent cobbles, 2 percent stones; neutral (pH 7.2); abrupt smooth boundary.

**A2**—2 to 6 inches; light brownish gray (10YR 6/2) very cobbly sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many very fine tubular and interstitial pores; 25 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.4); abrupt smooth boundary.

**Bt**—6 to 13 inches; dark yellowish brown (10YR 4/4) extremely cobbly clay, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; common very fine, fine, and medium roots; common very fine tubular pores; common thick clay films on faces of peds and lining pores; 30 percent pebbles, 35 percent cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary.

**R**—13 inches; basalt.

**Type location:** Mineral County, Nevada; about 1,100 feet west and 1,400 feet south of the northeast corner of sec. 35, T. 7 N., R. 28 E.; 38 degrees, 25

minutes, 32 seconds north latitude and 118 degrees, 49 minutes, 5 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Control section:** Clay content—25 to 35 percent; content of rock fragments—50 to 80 percent (weighted average), predominantly cobbles in most pedons

**Depth to bedrock:** 10 to 14 inches

**Reaction throughout the profile:** Neutral or mildly alkaline

**A horizon:**

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3

Rock fragments—50 to 80 percent

Structure—granular, platy, or subangular blocky

Clay content—5 to 15 percent

**Bt horizon:**

Hue—7.5YR or 10YR

Value—4 or 5 dry or moist

Chroma—3 to 5

Clay content—40 to 55 percent

### Sagouspe Series

The Sagouspe series consists of very deep, somewhat poorly drained soils that formed in mixed alluvium. These soils are on flood plains and low terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Aquic Xerofluvents

**Typical pedon:** Sagouspe sand, frequently flooded, 0 to 2 percent slopes, in an area of rangeland:

**A1**—0 to 2 inches; light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, very friable, nonsticky and nonplastic; few fine and medium roots; few fine tubular and common fine interstitial pores; violently effervescent; very strongly alkaline (pH 9.6); abrupt wavy boundary.

**A2**—2 to 11 inches; light brownish gray (10YR 6/2) sand, dark grayish brown (10YR 4/2) moist; many medium prominent yellowish brown (10YR 5/6) mottles in pockets only; single grained; loose, nonsticky and nonplastic; many very fine, fine, and medium roots; many fine interstitial pores; noneffervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

C1—11 to 13 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; common medium distinct mottles; massive; hard, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; common very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.9); abrupt smooth boundary.

2C2—13 to 25 inches; light brownish gray (2.5Y 6/2) fine sand, dark grayish brown (2.5Y 4/2) moist; few fine distinct mottles; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine and common medium roots; many very fine interstitial pores; moderately alkaline (pH 8.2); clear wavy boundary.

2C3—25 to 39 inches; light brownish gray (2.5Y 6/2) stratified coarse sand to fine sand, dark grayish brown (2.5Y 4/2) moist; few fine distinct mottles; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine and common medium roots; many very fine and fine interstitial pores; moderately alkaline (pH 8.2); clear wavy boundary.

2C4—39 to 45 inches; light brownish gray (2.5Y 6/2) fine sand, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few distinct mottles in root pores; many very fine interstitial pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

3C5—45 to 51 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct mottles; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; moderately alkaline (pH 8.2); abrupt irregular boundary.

4C6—51 to 60 inches; light brownish gray (2.5Y 6/2) sand, dark grayish brown (2.5Y 4/2) moist; few fine distinct mottles; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; moderately alkaline (pH 8.2).

**Type location:** Mineral County, Nevada; 2,100 feet east and 2,300 feet north of the southwest corner of sec. 20, T. 12 N., R. 29 E.; 38 degrees, 53 minutes, 30 seconds north latitude and 118 degrees, 46 minutes, 0 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Saturated within 40 inches of the surface during the spring and summer, except in drained areas

**Soil temperature:** 53 to 57 degrees F

**Control section:** Dominantly sand and loamy sand, thin strata and lenses of coarse sand to silt loam (averages loamy sand or loamy fine sand)

**Reaction throughout the profile:** Neutral to strongly alkaline; may be very strongly alkaline in the upper part

**Carbonates:** Noneffervescent or slightly effervescent in the coarser textures and slightly effervescent to violently effervescent in the finer textured material; segregated lime in the form of soft masses and concretions at any depth below 20 inches in some pedons, usually associated with finer textured strata

**Soil profile:** Hue—10YR or 2.5Y; value—4 or 5 moist, 5 to 7 dry; chroma—2 or 3

**Mottles:** Predominantly relict; at depths of 3 to 40 inches

### Sheeprock Family

The Sheeprock Family consists of deep, well drained soils that formed in alluvium and colluvium derived from granitic rock sources. These soils are on mountain alluvial fans and in drainageways. Slopes are 4 to 30 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Xeric Torriorthents

**Reference pedon:** Sheeprock Family, gravelly sandy loam, in an area of rangeland:

A1—0 to 2 inches; light brownish gray (10YR 6/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; very soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 15 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

A2—2 to 6 inches; light brownish gray (10YR 6/2) gravelly loamy sand, dark grayish brown (10YR 4/2) moist; massive; very soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many fine interstitial pores; 30 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

C1—6 to 17 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; 35 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

C2—17 to 31 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and

nonplastic; few fine and medium roots; common fine interstitial pores; 35 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

**C3**—31 to 55 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few fine and medium roots; common fine interstitial pores; 50 percent pebbles; slightly acid (pH 6.4).

**Type location:** Mineral County, Nevada; approximately 14 miles south of Hawthorne; about 2,600 feet west and 1,200 feet north of the southeast corner of sec. 33, T. 6 N., R. 30 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from early July to October

**Soil temperature:** 47 to 50 degrees F

**Control section:** Content of rock fragments—35 to 50 percent pebbles

### Silverbow Series

The Silverbow series consists of very shallow, well drained soils that formed in colluvium and alluvium derived from basalt and related rocks. These soils are on foot slopes, side slopes, and piedmonts of hills. Slopes are 8 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Silverbow very cobbly fine sandy loam, 8 to 15 percent slopes, in an area of rangeland in the Smedley-Silverbow-Annaw association:

**A**—0 to 3 inches; light brownish gray (10YR 6/2) very cobbly fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine interstitial pores; 15 percent pebbles, 20 percent cobbles, 5 percent stones; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

**Bt**—3 to 8 inches; pale brown (10YR 6/3) very cobbly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; many very fine tubular pores; common thin clay films in pores and coating ped faces; 25

percent pebbles, 25 percent cobbles, 10 percent stones; slightly effervescent; moderately alkaline (pH 7.9); abrupt wavy boundary.

**Btk**—8 to 10 inches; pale brown (10YR 6/3) very cobbly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; many very fine interstitial pores; few thin clay films lining pores; 40 percent pebbles, 20 percent cobbles; common thin lime and silica pendants on rock fragments; few fine soft lime masses; violently effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

**Bqkm1**—10 to 15 inches; indurated duripan capped by a laminar layer 2 to 10 millimeters thick.

**Bqkm2**—15 to 60 inches; strongly cemented duripan; discontinuous lenses of indurated material common throughout.

**Type location:** Mineral County, Nevada; about 100 feet south and 2,200 feet east of the northwest corner of sec. 16, T. 12 N., R. 27 E.; 38 degrees, 54 minutes, 28 seconds north latitude and 118 degrees, 58 minutes, 8 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Thickness of the solum and depth to indurated pan:** 8 to 14 inches

**Control section:** Texture—clay loam or sandy clay loam; clay content—20 to 35 percent; content of rock fragments—50 to 70 percent, dominantly stones or cobbles

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Other features:** Strongly cemented layers below the indurated duripan in some pedons

**A horizon:**

Value—5 or 6 dry, 3 or 4 moist (dark colors due to parent material)

Chroma—2 or 3

Structure—granular, platy, or massive

Carbonates—noneffervescent to strongly effervescent

**Bt horizon:**

Hue—7.5YR or 10YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—clay loam or sandy clay loam  
 Rock fragments—50 to 70 percent, dominantly stones or cobbles  
 Carbonates—slightly effervescent to strongly effervescent

**Btk horizon:**

Value—5 or 6 dry, 3 to 5 moist  
 Chroma—3 or 4  
 Texture—clay loam or sandy clay loam  
 Rock fragments—50 to 70 percent, mainly cobbles or stones  
 Carbonates—slightly effervescent to violently effervescent; soft lime masses or filaments and concretions in some pedons

**Singatse Series**

The Singatse series consists of very shallow, somewhat excessively drained soils that formed in residuum derived from rhyolite, andesite, dacite, and granitic rock. These soils are on side slopes of hills and mountains and on rock pediments. Slopes are 8 to 75 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents

**Typical pedon:** Singatse very gravelly sandy loam, 30 to 75 percent slopes, in an area of rangeland in the Singatse-Theon-Rock outcrop association:

- A—0 to 3 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 35 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary.
- C—3 to 9 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; many very fine and fine and few medium roots; many very fine interstitial pores; 35 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- R—9 inches; hard rhyolite with fractures and a few roots in the upper 1 or 2 inches.

**Type location:** Mineral County, Nevada; about 300 feet south and 900 feet west of the northeast corner of sec. 24, T. 12 N., R. 31½ E.; 38 degrees, 53 minutes, 38 seconds north latitude and 118 degrees, 25 minutes, 48 seconds west longitude.

**Range in Characteristics**

*Soil moisture:* Usually dry; moist for short periods in winter and spring

*Soil temperature:* 49 to 54 degrees F

*Control section:* Clay content—5 to 15 percent; content of rock fragments—35 to 60 percent, mostly pebbles; texture—very gravelly loam or very gravelly sandy loam

*Depth to lithic contact:* 4 to 10 inches

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

**A horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

**C horizon:**

Hue—10YR or 2.5Y

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

**Slaw Series**

The Slaw series consists of very deep, well drained soils that formed in alluvium derived from mixed sources. These soils are on alluvial flats, flood-plain playas, flood plains, and river terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torrifluvents

**Typical pedon:** Slaw silt loam, 0 to 2 percent slopes, in an area of rangeland:

- A1—0 to 3 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, very friable, sticky and plastic; few fine roots; common very fine and fine vesicular and few medium interstitial pores; violently effervescent; strongly alkaline (pH 8.7); abrupt smooth boundary.
- A2—3 to 9 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; soft, very friable, sticky and plastic; common fine and medium roots; common fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.
- C1—9 to 12 inches; light gray (10YR 7/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common fine and medium roots; common fine

tubular pores; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

2C2—12 to 48 inches; very pale brown (10YR 7/3) silty clay loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; few fine roots; few fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

3C3—48 to 60 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; many fine interstitial pores; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 1,500 feet south and 2,500 feet west of the northeast corner of sec. 11, T. 11 N., R. 33 E.; 38 degrees, 50 minutes, 27 seconds north latitude and 118 degrees, 13 minutes, 59 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Control section:** Clay content—18 to 35 percent; texture—silty clay loam or silt loam

**Calcium carbonate:** 1 to 4 percent

**Content of organic matter:** Decreases irregularly with depth

#### A horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 to 4

Structure—platy, blocky, or granular

Reaction—strongly alkaline or very strongly alkaline

Carbonates—slightly effervescent to violently effervescent

#### C horizon:

Value—6 to 8 dry, 4 to 6 moist

Chroma—2 to 4

Structure—subangular blocky, platy, or massive

Reaction—strongly alkaline or very strongly alkaline

### Smedley Series

The Smedley series consists of well drained soils that are shallow to a strongly cemented hardpan. These soils formed in alluvium derived from mixed igneous rocks. They are on toe slopes of hills, fanettes, fan piedmonts, and ballenas. Slopes are 2 to 30 percent.

Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Haplic Durargids

**Typical pedon:** Smedley very gravelly sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Smedley-Annaw-Izo association:

A—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine interstitial pores; 35 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.6); abrupt smooth boundary.

Bt1—2 to 6 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, sticky and plastic; common very fine and fine roots; many very fine tubular pores; common moderately thick clay films lining pores and coating faces of peds; 15 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); abrupt wavy boundary.

Bt2—6 to 11 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; slightly hard, friable, very sticky and very plastic; common fine and very fine roots between peds; many very fine tubular pores; common thin clay films lining pores and coating faces of peds; 15 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary.

Btk—11 to 15 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films lining pores; 15 percent pebbles, 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

Bqkm—15 to 33 inches; light gray (10YR 7/2) strongly cemented duripan with a discontinuous thin laminar cap and broken by krotovinas of gravelly sandy loam; few fine and very fine roots in fractures; violently effervescent; clear wavy boundary.

C—33 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 4/3) moist;

massive; slightly hard, very friable, nonsticky and nonplastic; common fine roots; many very fine and fine interstitial pores; 40 percent pebbles, 20 percent cobbles; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; about 1,600 feet north and 1,100 feet west of the southeast corner of sec. 27, T. 12 N., R. 27 E.; 38 degrees, 52 minutes, 14 seconds north latitude and 118 degrees, 56 minutes, 34 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—35 to 45 percent; content of rock fragments—10 to 35 percent

**Depth to duripan:** 14 to 20 inches

**Other features:** Discontinuous indurated laminae possible in pan

#### A horizon:

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Reaction—neutral or mildly alkaline

#### Bt horizon:

Hue—7.5YR or 10YR

Value—4 to 6 dry, 4 or 5 moist

Chroma—3 or 4

Texture—gravelly or cobbly clay loam or clay; subhorizons of loam or sandy clay loam in some pedons

Structure—blocky or prismatic

Reaction—neutral to moderately alkaline

Other features—no lime in the lower subhorizons of some pedons

#### Bqkm horizon:

Pan consistence—hard to extremely hard

### Snopoc Series

The Snopoc series consists of very deep, well drained soils that formed in residuum and colluvium derived from granitic rocks. These soils are on mountain side slopes, commonly in concave pockets. Slopes are 30 to 75 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 43 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Pachic Cryoborolls

**Typical pedon:** Snopoc very gravelly coarse sandy loam, 50 to 75 percent slopes, in an area of rangeland in the Snopoc-Rockabin-Hiridge association:

A1—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loamy coarse sand, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 45 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

A2—2 to 8 inches; brown (10YR 5/3) very gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 55 percent pebbles; neutral (pH 6.7); clear wavy boundary.

A3—8 to 17 inches; brown (10YR 5/3) very gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium and coarse roots; common very fine and fine interstitial and few very fine tubular pores; 45 percent pebbles, 5 percent cobbles; neutral (pH 6.8); clear wavy boundary.

AC—17 to 21 inches; brown (10YR 5/3) extremely gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; common fine interstitial and common very fine tubular pores; 60 percent pebbles, 5 percent cobbles; neutral (pH 6.8); gradual smooth boundary.

C—21 to 60 inches; pale brown (10YR 6/3) extremely gravelly coarse sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial and few very fine tubular pores; 65 percent pebbles, 5 percent cobbles; neutral (pH 6.8).

**Type location:** Mineral County, Nevada; in Corey Canyon; about 2,280 feet south and 2,605 feet west of the northeast corner of sec. 12, T. 7 N., R. 28 E.; 38 degrees, 28 minutes, 42 seconds north latitude and 118 degrees, 41 minutes, 39 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 41 to 45 degrees F

**Average summer soil temperature:** Less than 59 degrees F

**Thickness of the mollic epipedon:** 16 to 25 inches

**Reaction throughout the profile:** Slightly acid or neutral

**Control section:** Texture—coarse sandy loam or loam (with coarse sand dominating sand fraction); clay content—8 to 18 percent; content of rock fragments—50 to 75 percent pebbles (mostly 2 to 5 millimeters in size), 0 to 10 percent cobbles

#### A horizon:

Value—4 or 5 dry, 3 moist

Chroma—2 or 3

#### C horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Rock fragments—60 to 80 percent, predominantly pebbles 2 to 5 millimeters in size

### Sodaspring Series

The Sodaspring series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on fan skirts. Slopes are 0 to 4 percent. Mean annual precipitation is about 4 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Sodaspring loamy sand, 2 to 4 percent slopes, in an area of rangeland in the Sodaspring-Izo association, where pebbles cover about 20 percent of the surface and cobbles cover about 4 percent:

**A1**—0 to 2 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

**A2**—2 to 4 inches; very pale brown (10YR 7/3) coarse sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine vesicular pores;

violently effervescent; very strongly alkaline (pH 9.4); clear wavy boundary.

**C1**—4 to 7 inches; pale brown (10YR 6/3) sandy loam, yellowish brown (10YR 5/4) moist; moderate fine and medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very thin interstitial pores; violently effervescent; strongly alkaline (pH 8.9); clear wavy boundary.

**2C2**—7 to 17 inches; light yellowish brown (10YR 6/4) gravelly coarse sand, yellowish brown (10YR 5/4) moist; single grained; loose, nonsticky and nonplastic; common very fine to medium roots; many very fine interstitial pores; 20 percent pebbles; few lime coatings on bottoms of pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

**3C3**—17 to 22 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 10 percent pebbles; few fine gypsum filaments; slightly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

**3C4**—22 to 32 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

**4C5**—32 to 45 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 30 percent pebbles; few thin lime filaments in root channels; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

**5C6**—45 to 60 inches; pale brown (10YR 6/3) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 10 percent pebbles; few fine lime filaments; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; approximately  $\frac{5}{10}$  mile east and  $\frac{7}{10}$  mile north of Highways 95 and 23; about 2,370 feet west and 2,370 feet north of the southeast corner of sec. 27, T. 8 N., R. 34 E.; 38 degrees, 31 minutes, 23 seconds north latitude and 118 degrees, 10 minutes, 47 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms; dry in the lower part of the moisture control section

*Soil temperature:* 53 to 59 degrees F

*Control section:* Clay content—averages 10 to 18 percent, with individual horizons ranging from 6 to 18 percent; content of rock fragments—averages 15 to 35 percent, as much as 60 percent in some strata of some pedons (more than 50 percent pebbles 2 to 5 millimeters in size)

*Reaction throughout the profile:* Moderately alkaline to very strongly alkaline

*Electroconductivity:* 4 to 16 mmhos per centimeter

*Sodium adsorption ratio:* 30 to 50

*Carbonates:* Slightly effervescent to violently effervescent throughout

#### A horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—2 to 4

Structure—massive or single grained

#### C horizon:

Value—6 or 7 dry, 4 to 6 moist

Chroma—3 or 4

Texture—stratified very gravelly coarse sand to sandy loam (averages gravelly coarse sandy loam)

Structure—subangular blocky, platy, or massive

### Sonoma Series

The Sonoma series consists of very deep, poorly drained soils that formed in silty alluvium and lacustrine deposits derived from mixed rocks with a component of volcanic ash. These soils are on lake plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aeric Fluvaquents

**Typical pedon:** Sonoma silt loam, 0 to 2 percent slopes, in an area of rangeland:

A1—0 to 2 inches; light brownish gray (2.5Y 6/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; few fine distinct yellowish brown (10YR 5/6) mottles in root pores; moderate thin platy structure parting to weak fine and medium granular; slightly hard, very

friable, nonsticky and nonplastic; common medium and many very fine and fine roots; many very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2—2 to 6 inches; light brownish gray (2.5Y 6/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; common medium distinct yellowish brown (10YR 5/6) mottles; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and medium roots; many very fine interstitial and few fine and medium tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

C1—6 to 11 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; common medium distinct yellowish brown (10YR 5/6) mottles; massive; slightly hard, very friable, sticky and slightly plastic; few very fine and common fine and medium roots; many very fine interstitial and few fine and medium tubular pores; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

C2—11 to 33 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; 1- to 2-millimeter vertical cracks throughout with sand grains coating faces of cracks; few large distinct yellowish brown (10YR 5/6) mottles; massive; hard, friable, sticky and plastic; few very fine, fine, and medium roots; common fine and medium tubular pores; silt coatings lining pore walls; layer of white (10YR 8/1) volcanic ash 1 inch thick, upper boundary at 29 inches; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2C3—33 to 44 inches; light brownish gray (2.5Y 6/2) silt loam with thin strata of loamy sand in the lower part; very dark grayish brown (2.5Y 3/2) moist; many medium distinct yellowish brown (10YR 5/6) mottles; massive; soft, very friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; few fine tubular and common very fine and fine interstitial pores; silt coatings lining pore walls; moderately alkaline (pH 8.2); clear smooth boundary.

2C4—44 to 54 inches; gray (2.5Y 5/0) fine sandy loam, black (2.5Y 2/0) moist; many fine distinct yellowish brown (10YR 5/6) mottles; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few fine tubular and common very fine interstitial pores; silt coatings lining pore walls; noneffervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2C5—54 to 60 inches; gray (2.5Y 5/0) sand, black (2.5Y 2/0) moist; few fine distinct yellowish brown (10YR 5/6) mottles; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; noneffervescent; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; about 1,000 feet north and 1,000 feet west of the southeast corner of sec. 28, T. 12 N., R. 29 E.; 38 degrees, 52 minutes, 10 seconds north latitude and 118 degrees, 45 minutes, 10 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Saturated during spring and early summer, unless drained; water table at depths below 40 inches during the remainder of the year

**Soil temperature:** 49 to 53 degrees F

**Control section:** Clay content—25 to 35 percent; texture—stratified silt loam to silty clay loam with strata of clay or silty clay in some pedons

**Depth to buried A horizon:** 30 to 55 inches; no buried A horizon in some pedons

#### A horizon:

Hue—2.5Y or 10YR

Value—3 to 5 moist

Reaction—moderately alkaline to very strongly alkaline; moderately alkaline or strongly alkaline in buried A horizons

#### C horizon:

Hue—10YR, 2.5Y, or 5Y

Value—5 to 7 dry, 2 to 5 moist

Chroma—0 to 2

Structure—platy, subangular blocky, or massive; may be single grained in sandy strata

Texture—coarse sand to silt loam below a depth of 40 inches in some pedons

Reaction—moderately alkaline to very strongly alkaline

Other features—freshwater crustacean shells and lime concretions  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in diameter in most pedons

The Sonoma soils in this survey area have less calcium carbonate than is defined as the range for the series. This difference, however, does not significantly affect the use or management of the soils.

### Squawtip Series

The Squawtip series consists of moderately deep, well drained soils that formed in residuum and colluvium

derived from volcanic rocks. These soils are on side slopes of mountains. Slopes are 30 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Typical pedon:** Squawtip very stony loam, 30 to 50 percent slopes, in an area of woodland in the Squawtip-Brier-Rock outcrop association, where pebbles cover about 30 percent of the surface, cobbles about 10 percent, and stones about 8 percent:

A1—0 to 2 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial and few very fine tubular pores; 35 percent pebbles, 20 percent cobbles; slightly acid (pH 6.2); abrupt smooth boundary.

A2—2 to 10 inches; grayish brown (10YR 5/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine tubular pores; 40 percent pebbles, 20 percent cobbles; slightly acid (pH 6.4); clear smooth boundary.

Bt1—10 to 13 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine to medium roots; few very fine interstitial and common very fine tubular pores; few thin clay films on faces of peds; 40 percent pebbles, 5 percent cobbles; neutral (pH 6.6); clear smooth boundary.

Bt2—13 to 20 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine interstitial and common very fine tubular pores; 40 percent pebbles, 15 percent cobbles; common thin clay films on faces of peds; neutral (pH 6.6); clear smooth boundary.

Bt3—20 to 31 inches; pale brown (10YR 6/3) very cobbly sandy loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial and few very fine tubular pores; few thin clay films on faces of peds;

40 percent cobbles, 20 percent pebbles; neutral (pH 6.6); clear irregular boundary.

Cr—31 inches; weathered volcanic bedrock.

**Type location:** Mineral County, Nevada; approximately 3 miles south of Montgomery Pass; about 100 feet north and 2,000 feet east of the southwest corner of sec. 10, T. 1 N., R. 33 E.; 37 degrees, 56 minutes, 59 seconds north latitude and 118 degrees, 12 minutes, 29 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually moist in winter and spring, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

*Soil temperature:* 43 to 47 degrees F

*Depth to soft bedrock:* 20 to 40 inches

*Depth to hard bedrock:* Greater than 40 inches

*Control section:* Clay content—18 to 25 percent; content of rock fragments—35 to 60 percent

*Thickness of the mollic epipedon:* 10 to 18 inches

#### A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3

Reaction—slightly acid or neutral

#### Bt horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—loam, sandy loam, or sandy clay loam

Reaction—neutral or mildly alkaline

### Stewval Series

The Stewval series consists of very shallow, well drained soils that formed in residuum and colluvium derived from rhyolite and related rock. These soils are on hills and mountains. Slopes are 8 to 75 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Stewval very gravelly fine sandy loam, 15 to 50 percent slopes, in an area of rangeland in the Downeyville-Stewval-Blacktop association:

A—0 to 1 inch; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, nonsticky and slightly plastic; many very fine interstitial pores; few very fine roots; 40 percent pebbles; slightly

effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

Bt—1 to 6 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine tubular pores; common fine and very fine roots; 40 percent pebbles, 5 percent cobbles; slightly effervescent; many moderately thick clay films in pores and on faces of peds; mildly alkaline (pH 8.0); clear irregular boundary.

R—6 inches; hard rhyolite, fractured and weathered; roots in fractures in the upper 3 inches.

**Type location:** Mineral County, Nevada; about 2,400 feet east and 600 feet north of the southwest corner of sec. 25, T. 14 N., R. 34 E.; 39 degrees, 2 minutes, 41 seconds north latitude and 118 degrees, 6 minutes, 0 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Control section:* Clay content—18 to 27 percent; content of rock fragments—35 to 55 percent pebbles, 0 to 10 percent cobbles, 0 to 15 percent stones

*Depth to bedrock:* 4 to 14 inches

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline

*Carbonates:* Slightly effervescent to violently effervescent

#### A horizon:

Hue—10YR or 7.5YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—platy or subangular blocky

#### Bt horizon:

Hue—10YR, 7.5YR, or 5YR

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4

Texture of the fraction less than 2 millimeters—loam or clay loam

Structure—subangular blocky or granular

Other features—silica and lime pendants in some pedons

### Stumble Series

The Stumble series consists of very deep, somewhat

excessively drained soils that formed in mixed sandy alluvium and eolian deposits. These soils are on sand sheets. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Stumble loamy fine sand, 4 to 15 percent slopes, in an area of rangeland:

A—0 to 3 inches; light gray (10YR 7/2) loamy fine sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 10 percent pebbles; moderately alkaline (pH 8.3); clear smooth boundary.

Bw—3 to 12 inches; light gray (10YR 7/2) loamy fine sand, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 5 percent pebbles; moderately alkaline (pH 8.3); clear smooth boundary.

Bk1—12 to 18 inches; very pale brown (10YR 7/3) loamy fine sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and common fine roots; many very fine interstitial pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

Bk2—18 to 24 inches; very pale brown (10YR 7/3) gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and common fine roots; many very fine interstitial pores; 25 percent pebbles; violently effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

C—24 to 60 inches; very pale brown (10YR 7/3) gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 20 percent pebbles; strongly effervescent; strongly alkaline (pH 8.7).

**Type location:** Mineral County, Nevada; about 1,500 feet west and 670 feet north of the southeast corner of sec. 2, T. 4 N., R. 33 E.; 38 degrees, 13 minutes, 39 seconds north latitude and 118 degrees, 13 minutes, 29 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture—loamy sand or loamy fine sand, strata of fine sand and sand in some pedons; content of rock fragments—as much as 35 percent, dominantly pebbles

**Other features:** Value—5.5 to 7 dry, 3.5 to 5 moist; chroma—2 or 3

**Substratum:**

Texture—finer textured layers at depths below 40 inches in some pedons

Structure—single grained, subangular blocky, or massive

**A horizon:**

Reaction—neutral to moderately alkaline

**Bk horizon:**

Carbonates—slightly effervescent to violently effervescent

Reaction—moderately alkaline or strongly alkaline

**C horizon:**

Carbonates—slightly effervescent to violently effervescent

Reaction—moderately alkaline or strongly alkaline

### Sundown Series

The Sundown series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium and eolian deposits on sand sheets over alluvial fan piedmonts and fan skirts. Slopes are 2 to 8 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Sundown loamy sand, 2 to 8 percent slopes, in an area of rangeland:

A—0 to 3 inches; pale brown (10YR 6/3) loamy sand, dark grayish brown (10YR 4/2) moist; weak very thin platy structure; soft, very friable, nonsticky and nonplastic; very few micro roots; many very fine and fine interstitial pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C1—3 to 10 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C2—10 to 19 inches; pale brown (10YR 6/3) loamy fine sand, brown (10YR 4/3) moist; massive; soft, very

friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial and common very fine and fine tubular pores; violently effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

C3—19 to 60 inches; very pale brown (10YR 7/3) loamy fine sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; many very fine and fine interstitial pores; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** Mineral County, Nevada; 1,000 feet west and 2,500 feet north of the southeast corner of sec. 31, T. 9 N., R. 32 E.; 38 degrees, 35 minutes, 57 seconds north latitude and 118 degrees, 34 minutes, 11 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 55 to 59 degrees F

*Carbonates:* Calcareous throughout the profile

*Reaction throughout the profile:* Moderately alkaline to very strongly alkaline

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

#### C horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Texture—dominantly loamy fine sand; thin strata of sand, fine sand, or loamy sand in some pedons

Rock fragments—as much as 15 percent, dominantly pebbles

Unconformable material—at depths of 40 to 60 inches in some pedons, predominantly sandy clay loam

### Teguro Series

The Teguro series consists of shallow, well drained soils that formed in residuum derived from rhyolitic tuff and similar rock. These soils are on mountains. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Loamy, mixed, frigid Lithic Argixerolls

**Typical pedon:** Teguro very stony loam, 15 to 50 percent slopes, in an area of woodland in the Itca-Teguro-Rock outcrop association, where pebbles cover about 30 percent of the surface, cobbles about 10 percent, and stones about 5 percent:

A—0 to 4 inches; grayish brown (10YR 5/2) very stony loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial and few very fine tubular pores; 25 percent pebbles, 5 percent cobbles; neutral (pH 6.8); clear smooth boundary.

Bt1—4 to 8 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 30 percent pebbles; common thin clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

Bt2—8 to 15 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine, fine, and medium roots; common very fine tubular pores; 30 percent pebbles; common thin and few moderately thick clay films on faces of peds; neutral (pH 7.0); abrupt irregular boundary.

R—15 inches; hard, fractured andesite.

**Type location:** Mineral County, Nevada; 1,800 feet north and 1,800 feet east of the southwest corner of sec. 35, T. 2 N., R. 33 E.; 37 degrees, 59 minutes, 0 seconds north latitude and 118 degrees, 22 minutes, 56 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from mid-July to early October

*Soil temperature:* 43 to 47 degrees F

*Thickness of the mollic epipedon:* 7 to 12 inches, including the upper part of the Bt horizon

*Thickness of A and Bt horizons and depth to bedrock:* 14 to 20 inches

*Control section:* Clay content—25 to 35 percent; content of rock fragments—15 to 35 percent, mainly pebbles

*Reaction throughout the profile:* Slightly acid or neutral

#### A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—2 or 3 dry or moist

**Bt horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry or moist

Texture—gravelly loam or gravelly clay loam

**Tejabe Series**

The Tejabe series consists of very shallow, well drained soils that formed in residuum derived from intermediate volcanic rocks. These soils are on back slopes of mountains. Slopes are 30 to 75 percent. Mean annual precipitation is about 10 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, nonacid, mesic Lithic Xeric Torriorthents

**Typical pedon:** Tejabe very stony sandy loam, 50 to 75 percent slopes, in an area of rangeland in the Stewval-Gabbvally-Tejabe association, where pebbles cover about 25 percent of the surface, stones about 10 percent, and cobbles about 5 percent:

- A1—0 to 1 inch; brown (10YR 5/3) very stony sandy loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial and few very fine tubular pores; 35 percent pebbles, 10 percent stones, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary.
- A2—1 to 6 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; 45 percent pebbles; neutral (pH 7.0); clear smooth boundary.
- A3—6 to 8 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium and coarse and few very fine and fine roots; common very fine tubular pores; 50 percent pebbles; neutral (pH 7.0); clear wavy boundary.
- Bt—8 to 9 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; common very fine tubular pores; 50 percent pebbles; few thin clay films on faces of peds and in pores; neutral (pH 7.0); abrupt irregular boundary.

R—9 inches; hard, fractured, welded rhyolitic tuff; roots and soil in fractures.

**Type location:** Mineral County, Nevada; in the Gabbs Valley Range; about 200 feet north and 2,000 feet east of the southwest corner of sec. 16, T. 10 N., R. 34 E.; 38 degrees, 43 minutes, 10 seconds north latitude and 118 degrees, 18 minutes, 22 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Depth to bedrock:** 4 to 10 inches

**Control section:** Clay content—10 to 18 percent; content of rock fragments—35 to 55 percent

**A horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4 dry or moist

**Terlco Series**

The Terlco series consists of very deep, well drained soils that formed in mixed alluvium. These soils are on alluvial fans and fan piedmonts. Slopes are 2 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Typic Natrargids

**Typical pedon:** Terlco very gravelly fine sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Terlco-Annaw-Izo association:

- A1—0 to 1 inch; light gray (10YR 7/2) very gravelly fine sandy loam, brown (10YR 5/3) moist; strong thin and medium platy structure; slightly hard, very friable, sticky and slightly plastic; many fine and medium vesicular pores; 65 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.
- A2—1 to 4 inches; light gray (10YR 7/2) gravelly very fine sandy loam, brown (10YR 5/3) moist; strong thick platy structure; hard, friable, sticky and slightly plastic; many fine and medium vesicular pores; 25 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.
- Btn—4 to 13 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium prismatic structure parting to moderate fine and medium

subangular blocky; slightly hard, very friable, sticky and plastic; common very fine roots; common very fine tubular pores; 15 percent pebbles; many thin and few medium clay films on faces of peds; slightly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

- Btkn**—13 to 17 inches; very pale brown (10YR 7/4) gravelly loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common very fine roots; common very fine tubular pores; 20 percent pebbles; common thin clay films on faces of peds; common medium soft lime masses in seams; lime coatings and pendants on the bottoms of pebbles; violently effervescent; strongly alkaline (pH 8.8); gradual wavy boundary.
- Bk1**—17 to 25 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular pores; 35 percent pebbles; common medium soft lime masses in seams; lime coatings and pendants on the bottoms of pebbles; few fine gypsum filaments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
- Bk2**—25 to 34 inches; light gray (10YR 7/2) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular and common fine interstitial pores; 45 percent pebbles, 5 percent cobbles; common fine lime filaments and soft masses; lime coatings and pendants on the bottoms of pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- 2Bk3**—34 to 49 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 55 percent pebbles, 5 percent cobbles; lime coatings and pendants on the bottoms of pebbles; violently effervescent; strongly alkaline (pH 8.8); gradual wavy boundary.
- 2Bk4**—49 to 64 inches; light gray (10YR 7/2) very gravelly loamy sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 55 percent pebbles, 5 percent cobbles; lime coatings and pendants on the bottoms of pebbles; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Mineral County, Nevada; approximately 120 feet south of the Nye County line and 500 feet west of Highway 361; about 1,200 feet south and 900 feet west of the northeast corner of sec. 1, T. 10 N., R. 35 E.; 38 degrees, 45 minutes, 57 seconds north latitude and 118 degrees, 1 minute, 13 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July to October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Depth to bottom of natric horizon:* 10 to 18 inches

*Control section:* Texture of the fraction less than 2 millimeters—clay loam, loam, or sandy loam (subhorizons of sandy clay in some pedons); clay content—18 to 35 percent; content of coarse fragments—15 to 30 percent pebbles

*Carbonates:* Slightly effervescent to violently effervescent; major accumulations of carbonates in bands or pockets in some pedons

*Reaction:* Moderately alkaline to very strongly alkaline

#### *A horizon:*

Value—6 to 8 dry, 3 to 6 moist

Chroma—2 or 3

Structure—granular or platy

#### *Btn horizon:*

Value—5 to 7 dry, 4 to 6 moist

Chroma—3 or 4

Structure—platy to prismatic; may part to subangular blocky

Clay content—18 to 35 percent; as much as 40 percent in the upper part of the argillic horizon in some pedons

Other features—carbonate accumulations in the lower part of the argillic horizon

Sodium adsorption ratio—13 to 30

#### *Btkn horizon:*

Value—5 to 7 dry, 4 to 6 moist

Chroma—3 or 4

#### *Bk horizon:*

Value—5 to 8 dry, 4 to 7 moist

Chroma—2 to 4

Clay content—8 to 15 percent

Rock fragments—35 to 60 percent pebbles, 0 to 25 percent cobbles

#### *2Bk horizon:*

Value—5 to 8 dry, 4 to 7 moist

Chroma—2 to 4  
 Texture of the fraction less than 2 millimeters—  
 loamy sand or sand  
 Clay content—3 to 10 percent  
 Rock fragments—35 to 60 percent pebbles, 0 to 20  
 percent cobbles

### **Tert Series**

The Tert series consists of very shallow, well drained soils that formed in residuum derived from Tertiary lacustrine sedimentary rocks. These soils are on hills and pediment remnants. Slopes are 4 to 50 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents

**Typical pedon:** Tert loam, 15 to 50 percent slopes, in an area of rangeland in the Tert-Badland association:

A—0 to 3 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; massive; soft, very friable, sticky and plastic; few very fine and fine roots; common very fine interstitial pores; 2 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Cr1—3 to 7 inches; highly weathered and fractured bedrock; crushes to loam; many very fine and common medium roots along fractures; moderately alkaline (pH 8.2); abrupt clear boundary.

Cr2—7 to 16 inches; consolidated fractured lacustrine sediments; common medium roots in cracks.

**Type location:** Mineral County, Nevada; approximately 2 miles southwest of the ghost town of Simon; about 800 feet east and 500 feet south of the northwest corner of sec. 29, T. 8 N., R. 37 E.; 38 degrees, 32 minutes, 35 seconds north latitude and 117 degrees, 53 minutes, 27 seconds west longitude.

#### **Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 54 to 59 degrees F

**Control section:** Clay content—18 to 27 percent; content of rock fragments—0 to 15 percent, mainly pebbles

**Depth to paralithic contact:** 2 to 5 inches

**Depth to hard bedrock:** More than 60 inches

**Carbonates:** Strongly effervescent or violently effervescent

#### **A horizon:**

Hue—2.5Y or 10YR

Value—5 or 6 dry or moist

Chroma—2 to 4 dry or moist

Other features—surface crust about ¼ inch thick in some pedons

### **Theon Series**

The Theon series consists of shallow, well drained soils that formed in residuum derived from volcanic rock, mainly from andesite. These soils are on foothills and low mountains. Slopes are 8 to 75 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Haplargids

**Typical pedon:** Theon very stony fine sandy loam, 30 to 50 percent slopes, in an area of rangeland in the Singatse-Theon-Rock outcrop association, where pebbles cover about 30 percent of the surface, cobbles about 10 percent, and stones about 15 percent:

A—0 to 1 inch; pale brown (10YR 6/3) very stony fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine and fine roots; many very fine interstitial pores; 30 percent pebbles, 15 percent stones, 10 percent cobbles; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bt1—1 to 3 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common very fine and fine vesicular pores; few thin clay films in pores; 35 percent pebbles, 10 percent stones, 5 percent cobbles; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bt2—3 to 8 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium and many very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 30 percent pebbles, 5 percent cobbles, 5 percent stones; moderately alkaline (pH 8.2); abrupt wavy boundary.

R—8 inches; hard andesite, fractured in the upper 2 inches; few fine roots and clay coatings in fractures.

**Type location:** Mineral County, Nevada; approximately 1,400 feet north and 500 feet east of the southwest corner of sec. 19, T. 12 N., R. 32 E.; 38 degrees, 53 minutes, 19 seconds north latitude and 118 degrees, 25 minutes, 26 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist for short periods in winter and spring

*Soil temperature:* 53 to 59 degrees F

*Combined thickness of A and Bt horizons:* 8 to 14 inches

*Control section:* Clay content—25 to 35 percent; content of rock fragments—35 to 60 percent, mainly pebbles

*Depth to lithic contact:* 8 to 14 inches

*A horizon:*

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 to 4

Rock fragments—35 to 80 percent, mainly pebbles or stones

Structure—platy or granular

Reaction—neutral to moderately alkaline

*Bt horizon:*

Hue—10YR, 7.5YR, or 5YR

Value—4 to 7 dry, 3 to 5 moist

Chroma—3 or 4

Texture—very gravelly clay loam, very gravelly sandy clay loam, or very gravelly loam; extremely gravelly subhorizons in some pedons

Reaction—neutral to strongly alkaline

*Cr horizon:*

Other features—discontinuous thin coatings of silica or silica and lime along weak fracture planes in some pedons

### Theriot Series

The Theriot series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium derived from limestone and dolomite. These soils are on mountain slopes and hills. Slopes are 15 to 75 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Torriorthents

**Typical pedon:** Theriot very gravelly sandy loam, 30 to 75 percent slopes, in an area of rangeland in the Theriot-Eaglepass-Rock outcrop association, where pebbles cover about 50 percent of the surface and cobbles cover about 5 percent:

A1—0 to 3 inches; very pale brown (10YR 7/3) very gravelly sandy loam, yellowish brown (10YR 5/6) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine tubular pores; 45 percent pebbles, 15 percent cobbles; violently effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

C1—3 to 10 inches; very pale brown (10YR 7/4) very gravelly loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few medium and common very fine and fine roots; many very fine interstitial pores; 45 percent pebbles, 15 percent cobbles; common lime pendants 1 to 2 millimeters thick on rock fragments; violently effervescent; strongly alkaline (pH 8.7); clear irregular boundary.

R—10 inches; hard, fractured limestone.

**Type location:** Mineral County, Nevada; about 1,800 feet south and 2,400 feet west of the northeast corner of sec. 6, T. 8 N., R. 35 E.; 38 degrees, 34 minutes, 54 seconds north latitude and 118 degrees, 7 minutes, 10 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days in the upper part of the profile during the summer due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Control section:* Texture—loam, fine sandy loam, or sandy loam; content of rock fragments—50 to 80 percent, dominantly stones or cobbles but mostly pebbles in some pedons

*Depth to bedrock:* 4 to 20 inches

*Reaction throughout the profile:* Moderately alkaline to very strongly alkaline

*Value:* 6 or 7 dry, 4 or 5 moist

*Chroma:* 2 to 4

*Carbonates:* Common thin to thick lime pendants on rock fragments in the lower part; thin noncemented or cemented Bk horizons capping the bedrock in some pedons; 40 to 60 percent calcium carbonate equivalent

### Toney Family

The Toney Family consists of deep, well drained soils that formed in residuum and alluvium derived primarily from andesitic rock with some granitic rock and volcanic ash influence. These soils are on alluvial

fan piedmonts. Slopes are 2 to 8 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Fine, montmorillonitic, frigid Xerollic Paleargids

**Reference pedon:** Toney Family, gravelly sandy loam, in an area of rangeland where pebbles cover about 20 percent of the surface:

**A1**—0 to 1 inch; light brownish gray (10YR 6/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular pores; 25 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

**A2**—1 to 6 inches; light brownish gray (10YR 6/2) gravelly loam, dark brown (10YR 3/3) moist; massive; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine vesicular pores; 15 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

**Bt1**—6 to 15 inches; yellowish brown (10YR 5/4) gravelly clay, dark brown (10YR 4/3) moist; strong fine and medium angular blocky structure; hard, firm, very sticky and very plastic; common very fine and fine roots; many very fine and medium interstitial pores; 15 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.

**Bt2**—15 to 24 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong very fine and fine angular blocky structure; hard, friable, sticky and plastic; few very fine roots; many very fine and fine interstitial pores; 25 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

**Bkq**—24 to 36 inches; light gray (10YR 7/2) gravelly sandy loam, pale brown (10YR 6/3) moist; massive; hard, friable, nonsticky and nonplastic; many very fine and fine interstitial pores; 30 percent pebbles; 10 percent very hard and firm durinodes; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

**Bk**—36 to 56 inches; pale brown (10YR 6/3) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; 50 percent pebbles; mildly effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; approximately 16 miles southwest of Hawthorne; near the center of the northeast ¼ of sec. 17, T. 6 N., R. 30 E.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from early July to October

**Soil temperature:** 45 to 47 degrees F

**Bt horizon:**

Texture—gravelly clay, gravelly clay loam

Clay content—35 to 45 percent

Rock fragments—15 to 25 percent pebbles

**Bk horizon:**

Rock fragments—25 to 55 percent pebbles

### Tornillo Variant

The Tornillo Variant consists of deep, well drained soils that formed in alluvium derived from granitic and andesitic rock sources with an addition of volcanic ash (pumice). These soils are on flood plains. Slopes are 0 to 4 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Fluventic Camborthids

**Reference pedon:** Tornillo Variant fine sandy loam, in an area of rangeland:

**A**—0 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, dark brown (10YR 3/3) moist; moderate thick platy structure; soft, friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

**Bw1**—4 to 8 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 3/3) moist; moderate medium platy and strong medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, very sticky and very plastic; many very fine roots; many very fine and fine interstitial pores; mildly alkaline (pH 7.4); abrupt smooth boundary.

**Bw2**—8 to 12 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 3/3) moist; moderate medium platy and strong medium prismatic structure parting to moderate fine and medium angular blocky; hard, friable, very sticky and very plastic; many very fine and fine roots; many very fine and fine interstitial pores; mildly alkaline (pH 7.4); abrupt smooth boundary.

**2Ab**—12 to 19 inches; pale brown (10YR 6/3) sandy clay loam, dark brown (10YR 3/3) moist; massive; soft, friable, slightly sticky and slightly plastic; few

fine roots; many very fine interstitial pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

2Btb1—19 to 28 inches; pale brown (10YR 6/3) silty clay, brown or dark brown (10YR 4/3) moist; moderate fine prismatic structure parting to strong fine and medium angular blocky; very hard, firm, very sticky and very plastic; many very fine interstitial pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

2Btb2—28 to 36 inches; pale brown (10YR 6/3) silty clay loam, brown or dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; many fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

2Bkb1—36 to 48 inches; very pale brown (10YR 7/3) silty clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

2Bkb2—48 to 60 inches; very pale brown (10YR 7/3) silty clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.8).

**Type location:** Mineral County, Nevada; approximately 23 miles south of Hawthorne; about 200 feet north and 200 feet west of the southeast corner of sec. 16, T. 5 N., R. 30 E., in an unsurveyed township.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from early July to October

*Soil temperature:* 48 to 50 degrees F

*Control section:* Texture—averages clay loam or sandy clay loam; clay content—30 to 35 percent

*Bw horizon:*

Texture—clay loam, silty clay loam

Structure—platy, prismatic, or subangular blocky

#### Trocken Series

The Trocken series consists of very deep, well drained soils that formed in mixed alluvium. These soils are on alluvial fans, fan aprons, and inset fans. Slopes are 2 to 15 percent. Mean annual precipitation is about

6 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Trocken gravelly fine sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Rednik-Trocken-Bluewing association:

A1—0 to 3 inches; light gray (10YR 7/2) gravelly fine sandy loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure parting to moderate medium platy; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine and fine interstitial and few very fine tubular pores; 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

Bw—3 to 6 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; few very fine tubular and common very fine interstitial pores; 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.7); clear wavy boundary.

2Bk1—6 to 17 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and few fine roots; many very fine and fine interstitial pores; 55 percent pebbles; violently effervescent; lime pendants on rock fragments; few soft lime masses 3 to 6 centimeters in size; moderately alkaline (pH 8.4); clear wavy boundary.

3Bk2—17 to 36 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular and few very fine interstitial pores; 40 percent pebbles; violently effervescent; lime pendants on rock fragments; few soft lime masses 3 to 6 centimeters in size; few incipient durinodes; moderately alkaline (pH 8.4); gradual wavy boundary.

4Bk3—36 to 54 inches; very pale brown (10YR 7/3) very gravelly loamy coarse sand; single grained; loose, nonsticky and nonplastic; few very fine roots; common very fine and fine interstitial pores; 50 percent pebbles; strongly effervescent; lime pendants on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary.

5C—54 to 60 inches; very pale brown (10YR 7/3)

gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine tubular and few very fine interstitial pores; 15 percent pebbles; slightly effervescent; strongly alkaline (pH 8.5).

**Type location:** Mineral County, Nevada; about 1 mile north of Rawhide; about 100 feet south and 800 feet west of the northeast corner of sec. 31, T. 14 N., R. 32 E.; 39 degrees, 2 minutes, 38 seconds north latitude and 118 degrees, 24 minutes, 26 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Usually dry; moist for short periods in winter and spring

**Soil temperature:** 53 to 57 degrees F

**Combined thickness of A and Bw horizons:** 5 to 10 inches

**Control section:** Clay content—8 to 18 percent; content of rock fragments—35 to 70 percent; texture—highly stratified layers averaging very cobbly loam to extremely gravelly coarse sandy loam, individual strata ranging from gravelly loam to extremely gravelly coarse sand

**Reaction throughout the profile:** Neutral to very strongly alkaline in the upper part, moderately alkaline to very strongly alkaline in the lower part

#### A horizon:

Hue—10YR or 2.5Y

Value—5 to 7 dry, 4 to 6 moist

Chroma—2 or 3

#### Bw horizon:

Hue—10YR or 2.5Y

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

### Troutville Variant

The Troutville Variant consists of very deep, well drained soils that formed in colluvium derived from granodiorite with additions of volcanic ash. These soils are on mountain side slopes. Slopes are 30 to 75 percent. Mean annual precipitation is about 18 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Psammentic Cryoboralfs

**Typical pedon:** Troutville Variant very bouldery sandy loam, 30 to 75 percent slopes, in an area of woodland where pebbles cover about 25 percent of

the surface, cobbles about 5 percent, stones about 5 percent, and boulders about 7 percent:

- A1—0 to 1 inch; pale brown (10YR 6/3) very bouldery loamy sand, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 25 percent pebbles, 5 percent boulders; neutral (pH 6.8); clear smooth boundary.
- A2—1 to 4 inches; pale brown (10YR 6/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine interstitial pores; 30 percent pebbles, 5 percent boulders; neutral (pH 6.8); clear wavy boundary.
- A3—4 to 12 inches; light gray (10YR 7/2) very gravelly sandy loam, grayish brown (10YR 5/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine and common medium and coarse roots; common very fine interstitial and tubular pores; 45 percent pebbles, 10 percent cobbles; slightly acid (pH 6.4); gradual smooth boundary.
- A4—12 to 20 inches; light gray (10YR 7/2) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine and common medium and coarse roots; common very fine interstitial and tubular pores; 45 percent pebbles, 5 percent cobbles; slightly acid (pH 6.4); gradual smooth boundary.
- Bt—20 to 45 inches; pale brown (10YR 6/3) very gravelly loamy sand; matrix averages sandy loam (mixed); brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine and many coarse roots; common very fine interstitial and tubular pores; 40 percent pebbles, 5 percent cobbles, 5 percent stones; 30 percent sandy clay loam or sandy loam lamellae 1 to 5 centimeters in size with common moderately thick clay films; neutral (pH 6.6); gradual smooth boundary.
- C1—45 to 60 inches; pale brown (10YR 6/3) extremely gravelly coarse sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine to coarse roots; common very fine interstitial and tubular pores; 50 percent pebbles, 10 percent cobbles, 5 percent stones; neutral (pH 6.6).

**Type location:** Mineral County, Nevada; on the north side of Corey Peak; about 2,500 feet south and 400 feet west of the northeast corner of sec. 19, T. 7 N., R. 29 E.; 38 degrees, 32 minutes, 52 seconds north

latitude and 118 degrees, 46 minutes, 50 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Usually moist; dry in late summer and fall

*Soil temperature:* 42 to 45 degrees F

*Average summer soil temperature:* 53 to 57 degrees F

*Control section:* Clay content—10 to 18 percent; content of rock fragments—35 to 60 percent, mainly pebbles 2 to 5 millimeters in size

#### A horizon:

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 or 3 dry or moist

Reaction—neutral in the upper part, slightly acid in the lower part

Other features—strong volcanic ash influence dominating the surface color; meets all other requirements for a mollic epipedon

#### Bt horizon:

Value—5 or 6 dry, 4 or 5 moist

Texture—loamy sand matrix with bands and pockets of sandy clay loam and sandy loam; averages sandy loam (mixed)

Clay content—10 to 18 percent

Rock fragments—35 to 60 percent, mainly pebbles 2 to 5 millimeters in size

#### C horizons:

Chroma—2 or 3 dry or moist

Clay content—10 to 14 percent

Rock fragments—60 to 75 percent, mainly pebbles 2 to 5 millimeters in size

### Truhoy Series

The Truhoy series consists of very shallow, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on fan piedmont remnants. Slopes are 2 to 30 percent. Mean annual precipitation is about 7 inches, and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Entic Durorthids

**Typical pedon:** Truhoy gravelly loamy sand, 2 to 8 percent slopes, in an area of rangeland where pebbles cover about 45 percent of the surface:

A1—0 to 2 inches; pale brown (10YR 6/3) gravelly loamy sand, dark brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; many very fine interstitial pores; 30 percent pebbles;

moderately alkaline (pH 8.2); clear smooth boundary.

A2—2 to 5 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate thin and medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; many very fine and fine vesicular pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bqk—5 to 11 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine and medium roots; common very fine vesicular and few very fine tubular pores; 25 percent pebbles, 20 percent plates ¼ to 1 inch thick strongly cemented with silica; 25 percent plates ¼ to 1 inch thick weakly cemented with silica; strongly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

2Bqkm—11 to 17 inches; very pale brown (10YR 7/3) continuous duripan strongly cemented with silica and lime; discontinuous silica laminar cap; brown (10YR 5/3) moist; massive; very hard, extremely firm; very few very fine, fine, and medium roots in fractures; 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

3Bqk—17 to 60 inches; light gray (10YR 7/2) extremely gravelly sand, brown (10YR 5/3) moist; single grained; massive; loose and very hard, loose and very firm, nonsticky and nonplastic; few very fine roots; common very fine and fine interstitial pores; 70 percent pebbles; 35 percent strong to weak discontinuous silica cementation in the form of plates and pendants; violently effervescent; very strongly alkaline (pH 9.2).

**Type location:** Mineral County, Nevada; about 700 feet north and 2,100 feet west of the southeast corner of sec. 14, T. 3 N., R. 33 E.; 38 degrees, 6 minutes, 44 seconds north latitude and 118 degrees, 16 minutes, 34 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 55 to 59 degrees F

*Depth to duripan:* 6 to 14 inches

*Control section:* Clay content—10 to 18 percent; texture—sandy loam, loam, or fine sandy loam (averages sandy loam); content of rock fragments—

averages 15 to 35 percent, 35 to 50 percent in some horizons

*Reaction throughout the profile:* Moderately alkaline or strongly alkaline

*A horizon:*

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

*Bqk horizon:*

Chroma—3 or 4 dry or moist

Clay content—10 to 18 percent

Carbonates—slightly effervescent to strongly effervescent

Other features—30 to 60 percent plates ¼ to 1 inch thick strongly to weakly cemented with silica

*Bqkm horizon:*

Value—7 or 8 dry, 5 or 6 moist

Chroma—2 or 3 dry or moist

Rock fragments—less than 15 percent

*3Bqk horizon:*

Texture—stratified coarse sand to loamy sand

Rock fragments—35 to 75 percent, predominantly pebbles

Reaction—strongly alkaline or very strongly alkaline

Structure—massive or single grained

Consistence—loose to very hard

Other features—30 to 70 percent strong to weak discontinuous silica and lime cementation in the form of plates and pendants on rock fragments

## **Truvar Series**

The Truvar series consists of shallow, well drained soils that formed in mixed alluvium with a component of welded tuff or granite. These soils are on fan piedmont remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Durorthids

**Typical pedon:** Truvar gravelly loamy sand, 2 to 8 percent slopes, in an area of rangeland in the Truvar-Crunker association, where pebbles dominantly 2 to 5 millimeters in diameter cover about 25 percent of the surface:

A1—0 to 2 inches; light brownish gray (10YR 6/2) gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial pores; 25 percent

pebbles; neutral (pH 6.6); clear smooth boundary.  
A2—2 to 10 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine to coarse roots; common very fine vesicular and few very fine tubular pores; 20 percent pebbles; neutral (pH 6.8); gradual wavy boundary.

Bw—10 to 17 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; few very fine to coarse roots; common very fine tubular pores; 30 percent pebbles; 15 percent weak to strong silica plates; neutral (pH 7.2); gradual wavy boundary.

Bqkm—17 to 60 inches; very pale brown (10YR 7/3), strongly cemented duripan, yellowish brown (10YR 5/4) moist; strong continuous silica cementation with discontinuous laminar cap 1 millimeter thick; white (10YR 8/1) laminae, light gray (10YR 7/2) moist, in pockets of lime cementation on undersides of plates; 45 percent pebbles; strongly effervescent on laminar cap and in pockets; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; about 2,300 feet north and 700 feet west of the southeast corner of sec. 7, T. 2 N., R. 33 E.; 38 degrees, 4 minutes, 17 seconds north latitude and 118 degrees, 20 minutes, 44 seconds west longitude.

### **Range in Characteristics**

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Depth to strongly cemented duripan:* 14 to 20 inches

*Control section:* Sand content—50 to 70 percent, mostly medium and coarse; clay content—12 to 18 percent; content of rock fragments—15 to 35 percent pebbles, mostly 2 to 5 millimeters in diameter

*A horizon:*

Chroma—2 or 3 dry or moist

*Bw horizon:*

Clay content—12 to 18 percent

Rock fragments—15 to 35 percent pebbles, mostly 2 to 5 millimeters in diameter

Structure—platy or subangular blocky

Reaction—neutral or mildly alkaline

*Bqkm horizon:*

Value—7 or 8 dry, 5 to 7 moist  
 Chroma—2 or 3 dry, 3 or 4 moist  
 Rock fragments—35 to 50 percent pebbles, mostly  
 2 to 5 millimeters in diameter  
 Reaction—mildly alkaline or moderately alkaline  
 Carbonates—noneffervescent or slightly  
 effervescent in the matrix; slightly effervescent  
 to violently effervescent in pockets and on the  
 laminar cap

**Typic Cryorthents**

The Typic Cryorthents consist of very deep, well drained soils that formed in residuum and colluvium derived from intermediate to felsic volcanic rocks overlain by a mantle of volcanic ash. These soils are on mountain side slopes. Slopes are 15 to 50 percent. Mean annual precipitation is about 14 inches, and mean annual air temperature is about 42 degrees F.

**Reference profile:** Typic Cryorthents, loamy fine sand, 15 to 50 percent slopes, in an area of woodland:

- A1—0 to 5 inches; gray (10YR 5/1) loamy fine sand, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; slightly acid (pH 6.2); abrupt smooth boundary.
- A2—5 to 9 inches; light brownish gray (10YR 6/2) loamy fine sand, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and common medium to very coarse roots; many very fine interstitial pores; slightly acid (pH 6.3); clear smooth boundary.
- C—9 to 22 inches; white (10YR 8/2) loamy fine sand, light brownish gray (10YR 6/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and common medium to very coarse roots; many very fine interstitial pores; slightly acid (pH 6.2); abrupt smooth boundary.
- 2Ab1—22 to 36 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine to coarse roots; common very fine interstitial and few very fine tubular pores; 20 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.
- 2Ab2—36 to 60 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and nonplastic;

few very fine to coarse roots; few very fine tubular and common very fine interstitial pores; 35 percent pebbles; slightly acid (pH 6.2).

**Range in Characteristics**

*Soil moisture:* Usually moist in winter, spring, and early summer, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

*Mean annual soil temperature:* 42 to 44 degrees F

*Average summer soil temperature:* 52 to 54 degrees F

*Control section:* Clay content—averages 8 to 18 percent; content of rock fragments—20 to 40 percent

*Reaction throughout the profile:* Slightly acid or neutral

*Depth to 2A horizon:* 20 to 40 inches

**Typic Torriorthents**

The Typic Torriorthents consist of very deep, well drained or somewhat excessively drained soils that formed in alluvium derived from mixed rock sources and lacustrine materials. These soils are on side slopes of fan piedmont remnants, lake-plain terraces, and shorelines. Slopes are 2 to 75 percent. Mean annual precipitation is about 5 inches, and mean annual air temperature is about 53 degrees F.

**Reference profile:** Typic Torriorthents, very gravelly loamy sand, 8 to 30 percent slopes, in an area of rangeland in the Typic Torriorthents-Gynelle-Oricto association:

- A—0 to 6 inches; light gray (10YR 7/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few fine vesicular and common very fine interstitial pores; moderately alkaline (pH 8.4); clear wavy boundary.
- C—6 to 60 inches; light brownish gray (10YR 6/2) stratified very gravelly sandy loam to very gravelly sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular and few very fine interstitial pores; strongly alkaline (pH 8.6).
- Type location:** Mineral County, Nevada; about 2,400 feet south and 2,400 feet west of the northeast corner of sec. 11, T. 9 N., R. 30 E.; 38 degrees, 39 minutes, 24 seconds north latitude and 118 degrees, 36 minutes, 10 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Mean annual soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—3 to 25 percent; content of rock fragments—0 to 95 percent, mainly pebbles; texture of the fraction less than 2 millimeters—stratified sand to silt loam

**Reaction throughout the profile:** Moderately alkaline to strongly alkaline

### Unsel Series

The Unsel series consists of very deep, well drained soils that formed in mixed alluvium. These soils are on alluvial fan piedmonts. Slopes are 2 to 30 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is 53 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Haplargids

**Typical pedon:** Unsel very gravelly fine sandy loam, 4 to 30 percent slopes, in an area of rangeland in the Unsel-Annav association:

**A1**—0 to 1 inch; light gray (10YR 7/2) very gravelly fine sandy loam, grayish brown (10YR 5/2) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; common very fine interstitial and few very fine vesicular pores; 40 percent pebbles, 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**A2**—1 to 5 inches; light gray (10YR 7/2) gravelly fine sandy loam, grayish brown (10YR 5/2) moist; moderate thick platy structure parting to weak thin platy; slightly hard, very friable, slightly sticky and nonplastic; common very fine to medium roots; common very fine vesicular and few very fine interstitial pores; 20 percent pebbles, 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**Bt**—5 to 8 inches; pale brown (10YR 6/3) gravelly sandy clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine to medium roots; common very fine tubular pores; 25 percent pebbles; common thin clay films on faces of peds; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**Btk**—8 to 11 inches; pale brown (10YR 6/3) gravelly sandy clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine to medium roots; common very fine tubular pores; 25 percent pebbles; few moderately thick and common thin clay films on faces of peds; lime pendants on pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**Bqk**—11 to 30 inches; very pale brown (10YR 7/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; few very fine tubular and common very fine interstitial pores; 25 percent pebbles; 25 percent discontinuous strong silica- and lime-cemented areas and pendants on pebbles; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

**2C**—30 to 60 inches; light gray (10YR 7/2) very gravelly sand, grayish brown (10YR 5/2) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 50 percent pebbles; strongly alkaline (pH 9.0).

**Type location:** Mineral County, Nevada; about 1,250 feet north and 1,250 feet west of the southeast corner of sec. 9, T. 10 N., R. 32 E.; 38 degrees, 44 minutes, 24 seconds north latitude and 118 degrees, 24 minutes, 48 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Depth to Bqk horizon:** 10 to 22 inches

**Control section:** Clay content—27 to 35 percent; texture—clay loam or sandy clay loam; content of rock fragments—15 to 30 percent

**Carbonates:** Noneffervescent to violently effervescent

**Depth to 2C horizon:** 20 to 36 inches

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 to 4

Reaction—moderately alkaline to very strongly alkaline

**Bt horizon:**

Value—5 to 7 dry, 3 to 6 moist

Chroma—2 to 4

Texture—clay loam or sandy clay loam

Rock fragments—15 to 30 percent

Clay content—27 to 35 percent  
 Structure—weak or moderate fine or medium subangular blocky, weak medium or coarse prismatic, or massive  
 Reaction—mildly alkaline or strongly alkaline

**Bqk horizon:**

Value—7 or 8 dry, 4 to 6 moist  
 Chroma—2 to 4

**2C horizon:**

Value—7 or 8 dry, 3 to 5 moist  
 Chroma—2 to 4  
 Rock fragments—50 to 70 percent

**Uripnes Series**

The Uripnes series consists of very shallow, well drained soils that formed in residuum derived from granodiorite. These soils are on mountains and hills. Slopes are 15 to 75 percent. Mean annual precipitation is about 6 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, nonacid, mesic, shallow Typic Torriorthents

**Typical pedon:** Uripnes extremely bouldery sandy loam, 50 to 75 percent slopes, in an area of rangeland in the Uripnes-Budihol-Rock outcrop association, where stones cover about 15 percent of the surface and boulders cover about 10 percent:

A—0 to 4 inches; pale brown (10YR 6/3) extremely bouldery sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many common fine roots; many fine interstitial pores; 20 percent pebbles, 20 percent cobbles, 25 percent boulders and stones; neutral (pH 7.3); clear smooth boundary.

Cr—4 to 21 inches; weathered granodiorite; few fine roots in fractures in the upper part.

R—21 inches; unweathered granodiorite.

**Type location:** Mineral County, Nevada; approximately 1 mile south of Big Kasock Mountain; about 2,100 feet east and 300 feet north of the southwest corner of sec. 36, T. 14 N., R. 32 E.; 39 degrees, 1 minute, 41 seconds north latitude and 118 degrees, 25 minutes, 45 seconds west longitude.

**Range in Characteristics**

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10

to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture of the fine earth fraction—sandy loam or coarse sandy loam; clay content—5 to 18 percent; content of rock fragments—35 to 60 percent, dominantly fine pebbles

**Depth to weathered bedrock:** 3 to 14 inches to paralithic contact

**Depth to unweathered bedrock:** 20 to 40 inches

**Reaction throughout the profile:** Slightly acid to mildly alkaline; moderately alkaline with lime coatings on the undersides of pebbles in the lower part of the profile in some pedons

**A horizon:**

Value—5 to 7 dry, 3 to 5 moist (darker colors due to parent material)

Chroma—2 or 3 dry or moist

Structure—weak subangular blocky, platy, or massive

**C horizon:**

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3 dry or moist

Other features—C horizon only in some pedons 8 to 14 inches thick

**Veet Series**

The Veet series consists of very deep, well drained soils that formed in mixed alluvium. These soils are on alluvial fans, side slopes of fan piedmont remnants, and inset fans. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Xerollic Camborthids

**Typical pedon:** Veet gravelly loamy sand, 2 to 8 percent slopes, in an area of rangeland in the Veet-ltme association:

A—0 to 3 inches; light brownish gray (10YR 6/2) gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 25 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary.

Bw—3 to 17 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky

structure; slightly hard, very friable, nonsticky and nonplastic; common very fine to medium roots; common very fine tubular pores; 35 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary.

**Bk1**—17 to 31 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine to medium roots; few fine interstitial and common very fine tubular pores; 30 percent pebbles, 5 percent cobbles; few lime pendants 1 millimeter thick coating pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

**Bk2**—31 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine to medium roots; few very fine tubular and few very fine interstitial pores; 30 percent pebbles, 15 percent cobbles; few lime pendants 1 millimeter thick coating pebbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; approximately 1.5 miles east of the California State line; about 600 feet south and 800 feet west of the northeast corner of sec. 33, T. 1 N., R. 32 E.; 37 degrees, 54 minutes, 24 seconds north latitude and 118 degrees, 24 minutes, 10 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—10 to 18 percent; content of rock fragments—35 to 65 percent

**Depth to lime:** 12 to 20 inches

#### A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—subangular blocky or single grained

Reaction—mildly alkaline or moderately alkaline

Carbonates—noneffervescent or slightly effervescent

#### Bw horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 to 4

Structure—weak or moderate fine or medium subangular blocky

Reaction—mildly alkaline or moderately alkaline

Carbonates—noneffervescent or slightly effervescent

#### Bk horizon:

Value—5 to 7 dry, 4 or 5 moist

Chroma—2 to 4

Reaction—moderately alkaline or strongly alkaline

Carbonates—strongly effervescent or violently effervescent

### Venable Family

The Venable Family consists of very deep, poorly drained soils that formed in alluvium derived from mixed rock sources. These soils are in intermontane valleys. Slopes are 0 to 8 percent. Mean annual precipitation is about 16 inches, and mean annual temperature is about 42 degrees F.

**Taxonomic class:** Fine-loamy, mixed Cumulic Cryaquolls

**Reference profile:** Cumulic Cryaquolls, loamy, 0 to 8 percent slopes, in an area of rangeland:

**A1**—0 to 15 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; few very fine interstitial and common very fine tubular pores; slightly acid (pH 6.4); clear smooth boundary.

**A2**—15 to 35 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; few fine distinct light yellowish brown (10YR 6/4) mottles, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, sticky and slightly plastic; common very fine, fine, and medium roots; common very fine tubular pores; slightly acid (pH 6.3); clear smooth boundary.

**C**—35 to 60 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; common fine distinct light yellowish brown (10YR 6/4) mottles, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; slightly acid (pH 6.3).

**Type location:** Mineral County, Nevada; approximately 3.5 miles southwest of Mount Grant; about 650 feet east and 1,300 feet north of the southwest corner of sec. 25, T. 8 N., R. 28 E.; 38 degrees, 31 minutes, 15 seconds north latitude and 118 degrees, 48 minutes, 32 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Usually moist throughout the year; water table at depths of 1 to 2 feet from winter to spring

*Mean annual soil temperature:* 40 to 42 degrees F

*Average summer soil temperature:* 46 to 48 degrees F

*Thickness of the mollic epipedon:* 16 to 35 inches

*Control section:* Clay content—18 to 35 percent; content of rock fragments—less than 15 percent; texture—loam, silt loam, or clay loam

*Reaction throughout the profile:* Slightly acid or neutral

### Veta Series

The Veta series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on inset fans. Slopes are 2 to 8 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Xerollic Camborthids

**Typical pedon:** Veta very gravelly sandy loam, 2 to 8 percent slopes, in an area of rangeland in the Veta-Smedley association:

**A**—0 to 4 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine interstitial pores; 35 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

**Bw**—4 to 17 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine tubular and interstitial pores; 35 percent pebbles; neutral (pH 7.2); abrupt wavy boundary.

**C**—17 to 28 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine interstitial pores; 40 percent pebbles, 10 percent cobbles, 5 percent stones; moderately alkaline (pH 7.4); clear wavy boundary.

**Ck**—28 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; many very fine interstitial pores; 45

percent pebbles, 20 percent cobbles; few thin lime pendants on rock fragments; effervescent; mildly alkaline (pH 7.8).

**Type location:** Mineral County, Nevada; 600 feet south and 200 feet east of the northwest corner of sec. 32, T. 8 N., R. 28 E.; 38 degrees, 30 minutes, 56 seconds north latitude and 118 degrees, 54 minutes, 18 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry from mid-June to October

*Soil temperature:* 50 to 53 degrees F

*Combined thickness of A and Bw horizons:* 12 to 20 inches

*Depth to lime:* 28 to 40 inches

*Control section:* Texture—very gravelly or extremely gravelly loam, sandy loam, or coarse sandy loam; clay content—5 to 15 percent; content of rock fragments—35 to 75 percent, mainly pebbles

*Reaction throughout the profile:* Neutral to moderately alkaline

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Rock fragments—35 to 80 percent pebbles or cobbles

Structure—platy or massive

*Bw horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Structure—subangular blocky or massive

*C horizons:*

Value—5 to 7 dry, 3 to 5 moist

Chroma—2 or 3; may be 4 in the Ck horizon

Carbonates—slightly effervescent to strongly effervescent in the lower subhorizons

Other features—thin strata of loamy sand or loamy coarse sand common in lower subhorizons of some pedons

### Vinini Family

The Vinini Family consists of shallow, well drained soils that formed in residuum, alluvium, and colluvium derived from mixed rock sources. These soils are on alluvial fan piedmonts and plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 45 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid, shallow Xerollic Durargids

**Reference pedon:** Vinini Family, very gravelly sand, in an area of rangeland:

A—0 to 1 inch; pale brown (10YR 6/3) very gravelly sand, very dark grayish brown (10YR 3/2) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; 40 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary.

Bt1—1 to 3 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; common very fine and fine tubular and interstitial pores; common thin clay films on faces of ped; 5 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bt2—3 to 9 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine roots; common very fine interstitial pores; common thin clay films on faces of ped; 60 percent gravel-size pan fragments; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bt3—9 to 15 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, brown (10YR 4/3) moist; weak very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common fine and medium interstitial pores; common thin clay films on faces of ped; 60 percent gravel-size pan fragments; moderately alkaline (pH 8.2); abrupt smooth boundary.

Bkq—15 to 19 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, friable, nonsticky and nonplastic; few fine roots; common medium interstitial pores; 60 percent gravel-size pan fragments; moderately alkaline (pH 8.2); abrupt smooth boundary.

Bkqm—19 inches; indurated, platy duripan.

**Type location:** Mineral County, Nevada; approximately 21 miles south of Hawthorne; about 1,500 feet north and 1,200 feet east of the southwest corner of sec. 36, T. 5 N., R. 30 E.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry from early July to October

**Soil temperature:** 44 to 47 degrees F

**Depth to indurated duripan:** 14 to 20 inches

**Bt horizon:**

Clay content—27 to 35 percent

Rock fragments—35 to 60 percent extremely hard and very firm silica-cemented gravel-size duripan fragments

#### Wabuska Series

The Wabuska series consists of very deep, somewhat poorly drained soils that formed in alluvium derived from mixed rocks. These soils are on lake plains. Slopes are 0 to 2 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Wabuska loam, 0 to 2 percent slopes, in an area of rangeland in the Wabuska-Isolde association:

A1—0 to 1 inch; light gray (10YR 7/2) loamy sand, brown (10YR 4/3) moist; strong moderately thick platy structure; soft, very friable, nonsticky and nonplastic; many very fine interstitial pores; few very fine roots; slightly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

A2—1 to 14 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many fine tubular pores; common fine roots; strongly effervescent; very strongly alkaline (pH 9.6); abrupt smooth boundary.

2C1—14 to 25 inches; pale brown (10YR 6/3) loamy coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine interstitial pores; common fine and medium roots; slightly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary.

3C2—25 to 36 inches; very pale brown (10YR 7/3) fine sandy loam, yellowish brown (10YR 5/4) moist; many coarse grayish brown (10YR 5/2 moist) mottles; massive; soft, very friable, nonsticky and slightly plastic; many very fine interstitial pores; few fine roots; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary.

4C3—36 to 45 inches; very pale brown (10YR 7/3) fine sandy loam, yellowish brown (10YR 5/4) moist; common coarse grayish brown (10YR 5/2 moist) mottles; massive; soft, very friable, nonsticky and slightly plastic; many very fine interstitial pores;

strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.

5C4—45 to 60 inches; white (10YR 8/2) fine sandy loam, yellowish brown (10YR 5/4) moist; many very coarse grayish brown (10YR 5/2) and gray (10YR 5/1 moist) mottles; massive; soft, very friable, nonsticky and slightly plastic; many very fine interstitial pores; slightly effervescent; strongly alkaline (pH 9.0).

**Type location:** Mineral County, Nevada; 2,200 feet west and 2,400 feet south of the northeast corner of sec. 36, T. 13 N., R. 33 E.; 38 degrees, 57 minutes, 19 seconds north latitude and 118 degrees, 12 minutes, 48 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Saturated at 30 to 60 inches for 30 to 60 days in spring, unless artificially drained; dry in the upper part of the profile, but moist for short periods in winter and early spring

**Soil temperature:** 53 to 59 degrees F

**Sodium adsorption ratio:** Commonly above 30 in the upper 20 inches, decreasing below this depth

**Control section:** Clay content—10 to 18 percent

**Reaction throughout the profile:** Strongly alkaline or very strongly alkaline and very slightly effervescent to strongly effervescent in the upper 20 inches; mildly alkaline to strongly alkaline and noneffervescent to strongly effervescent below a depth of 20 inches

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

Structure—platy, blocky, granular, or massive

#### C horizon:

Hue—10YR or 2.5Y

Value—5 to 8 dry, 3 to 5 moist

Chroma—2 to 4

Texture—stratified loam to sand, mostly fine sandy loam

Mottles—faint to prominent

### Wardenot Series

The Wardenot series consists of very deep, excessively drained soils that formed in alluvium derived from mixed rocks. These soils are on fan piedmonts and inset fans. Slopes are 2 to 30 percent. Mean annual precipitation is about 5 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Wardenot very gravelly loamy sand, moist, 2 to 8 percent slopes, in an area of rangeland in the Wardenot, moist-izo association:

A1—0 to 1 inch; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; many very fine interstitial pores; 60 percent pebbles; slightly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

A2—1 to 4 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine vesicular and interstitial pores; 50 percent pebbles, 10 percent cobbles; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

Bqk1—4 to 16 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 55 percent pebbles, 5 percent cobbles; thin pendants of silica and lime on rock fragments; strongly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

Bqk2—16 to 24 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; common very fine to medium roots; many very fine and fine interstitial pores; 40 percent pebbles, 5 percent cobbles; thin pendants of silica and lime on rock fragments; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bk—24 to 60 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots with pockets of common very fine to medium roots; many very fine and fine interstitial pores; 60 percent pebbles, 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.7).

**Type location:** Mineral County, Nevada; in Monte Cristo Valley; about 1,500 feet east and 100 feet south of the northwest corner of sec. 10, T. 6 N., R. 37 E.; 38 degrees, 23 minutes, 58 seconds north latitude and 117 degrees, 51 minutes, 24 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually dry; moist in some parts for short periods during winter and early spring and from 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 59 degrees F

**Control section:** Texture of the fraction less than 2 millimeters—averages loamy sand; content of rock fragments—40 to 75 percent (includes cobbles and stones)

**Reaction throughout the profile:** Mildly alkaline to strongly alkaline, commonly increasing with depth

#### A horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3

Carbonates—noneffervescent to strongly effervescent; may be violently effervescent where influenced by eolian depositions

Structure—massive, platy, or subangular blocky; may be single grained in immediate surface

#### Bqk and Bk horizons:

Value—5 to 7 dry, 3 to 5 moist (dark colors due to parent material)

Chroma—2 to 4

Texture—stratified extremely gravelly fine sandy loam to cobbly loamy sand; strata of very gravelly or cobbly sandy loam or fine sandy loam in the upper part of the substratum

Rock fragments—average of 40 to 75 percent; as little as 25 percent in individual strata

Lime and silica—common lime and silica pendants in some part of the B horizon

Carbonates—strongly effervescent or violently effervescent

Structure—single grained or massive

### Wassit Series

The Wassit series consists of very shallow, well drained soils that formed in residuum and colluvium derived from volcanic rocks. These soils are on mountains and hills. Slopes are 15 to 75 percent. Mean annual precipitation is 12 to 14 inches, and mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Lithic Mollic Haploxeralfs

**Typical pedon:** Wassit very gravelly sandy loam, 15 to 50 percent slopes, in an area of woodland in the Wassit-Brawley association:

A1—0 to 1 inch; pale brown (10YR 6/3) very gravelly very fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium and thick platy structure parting to weak thin platy; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores and few very fine vesicular pores; 40 percent pebbles; neutral (pH 7.0); clear smooth boundary.

A2—1 to 6 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine tubular and few very fine interstitial pores; 45 percent pebbles; neutral (pH 7.2); clear smooth boundary.

Bt1—6 to 9 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; common medium and coarse and few very fine and fine roots; common very fine tubular pores and few very fine interstitial pores; 45 percent pebbles; few thin clay films bridging sand grains; neutral (pH 7.2); clear wavy boundary.

Bt2—9 to 12 inches; light olive brown (2.5Y 5/4) very gravelly clay loam, olive brown (2.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common medium and coarse and few very fine and fine roots; common very fine tubular pores and few very fine interstitial pores; 50 percent pebbles; common thin and few moderately thick clay films on faces of peds; neutral (pH 7.2); clear irregular boundary.

R—12 inches; hard, fractured, altered volcanic bedrock with some soil in the fractures.

**Type location:** Mineral County, Nevada; about 700 feet east and 100 feet north of the southwest corner of sec. 2, T. 10 N., R. 28 E.; 38 degrees, 45 minutes, 2 seconds north latitude and 118 degrees, 49 minutes, 56 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Usually moist in winter and spring, dry in summer and fall but moist intermittently due to convection storms; dry in all parts of the profile for at least 45 consecutive days after the summer solstice

**Soil temperature:** 44 to 47 degrees F

**Thickness of the solum and depth to bedrock:** 6 to 14 inches

**Reaction throughout the profile:** Neutral or mildly alkaline

*Control section:* Clay content—18 to 27 percent; content of rock fragments—35 to 60 percent, mostly pebbles

*A horizon:*

Chroma—2 or 3

*B horizon:*

Hue—10YR or 2.5Y

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Clay content—averages 25 to 35 percent; as much as 40 percent in subhorizons

### **Watoopah Family**

The Watoopah Family consists of deep, well drained soils that formed in alluvium derived from mixed rock sources. These soils are on alluvial fan pediments and beach terraces. Slopes are 2 to 8 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 48 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Haplargids

**Reference pedon:** Watoopah Family, loamy sand, in an area of rangeland:

A1—0 to 2 inches; light gray (10YR 7/2) loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; neutral (pH 6.6); abrupt smooth boundary.

A2—2 to 4 inches; pale brown (10YR 6/3) fine sandy loam; dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common fine and medium vesicular pores; neutral (pH 6.6); abrupt smooth boundary.

Bt1—4 to 8 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; neutral (pH 6.6); abrupt smooth boundary.

Bt2—8 to 13 inches; pale brown (10YR 6/3) cobbly sandy loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common fine interstitial pores; 25 percent cobbles, 5 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

Bkq1—13 to 20 inches; pale brown (10YR 6/3) gravelly

sandy clay loam, brown (10YR 4/3) moist; massive; hard, firm, sticky and plastic; few fine roots; many very fine and fine interstitial pores; 30 percent pebbles; weakly to moderately cemented with silica; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

Bkq2—20 to 29 inches; pale brown (10YR 6/3) gravelly loamy sand, dark brown (10YR 3/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; common very fine interstitial pores; 35 percent pebbles; moderately cemented with silica; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

Bkq3—29 to 44 inches; pale brown (10YR 6/3) very gravelly sand, brown (10YR 4/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; common fine interstitial pores; 45 percent pebbles; weakly cemented with silica; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary.

Bkqm—44 inches; indurated duripan.

**Type location:** Mineral County, Nevada; approximately 34 miles south of Hawthorne; about 2,600 feet south and 1,500 feet west of the apparent northeast corner of sec. 5, T. 3 N., R. 29 E.

#### **Range in Characteristics**

*Soil moisture:* Moist in winter and spring, dry from early July to October

*Soil temperature:* 47 to 50 degrees F

*Depth to indurated duripan:* 40 to 60 inches

*A horizon:*

Structure—single grained or massive

*Bt horizon:*

Clay content—10 to 18 percent

Texture—fine sandy loam, sandy loam, or cobbly sandy loam

Rock fragments—0 to 5 percent pebbles, 0 to 30 percent cobbles

*Bk horizon:*

Texture—stratified sandy clay loam, loamy sand, and sand

Rock fragments—35 to 45 percent pebbles

### **Wedlar Series**

The Wedlar series consists of very deep, well drained soils that formed in alluvium derived from granitic rocks or welded rhyolitic tuff. These soils are on fan piedmonts and ballenas and in interplateau basins. Slopes are 2 to 15 percent. Mean annual precipitation is

about 9 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Wedlar loamy sand, 2 to 4 percent slopes, in an area of rangeland in the Wellsed-Wedlar association:

**A1**—0 to 5 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 10 percent pebbles; neutral (pH 7.3); abrupt wavy boundary.

**A2**—5 to 8 inches; light gray (10YR 7/2) sandy loam, brown (10YR 4/3) moist; moderate very thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular pores; neutral (pH 7.3); abrupt smooth boundary.

**Bt1**—8 to 11 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular and interstitial pores; common thin clay films lining pores; mildly alkaline (pH 7.8); abrupt smooth boundary.

**Bt2**—11 to 15 inches; yellowish brown (10YR 5/4) sandy clay, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; hard, firm, very sticky and plastic; common very fine and fine roots; common very fine tubular pores; many moderately thick clay films lining pores and coating faces of peds; neutral (pH 7.2); abrupt smooth boundary.

**Bt3**—15 to 21 inches; yellowish brown (10YR 5/4) sandy clay, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick clay films lining pores and coating faces of peds; neutral (pH 7.2); abrupt smooth boundary.

**Btk**—21 to 31 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and nonplastic; few very fine roots; common very fine tubular pores; common thin clay films lining pores; 10 percent pebbles; few fine prominent white (10YR 8/2) lime filaments; neutral (pH 7.2); abrupt irregular boundary.

**Bqk**—31 to 60 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR

4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine tubular and interstitial pores; 20 percent pebbles, 5 percent cobbles; few thin lime and silica pendants on rock fragments; discontinuous weak cementation in thick lenses; strongly effervescent; mildly alkaline (pH 7.6).

**Type location:** Mineral County, Nevada; about 1,250 feet north and 1,250 feet west of the southeast corner of sec. 9, T. 10 N., R. 32 E.; 38 degrees, 44 minutes, 24 seconds north latitude and 118 degrees, 24 minutes, 48 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Control section:** Clay content—27 to 35 percent

**Depth to Bq horizon:** 25 to 40 inches

#### A horizon:

Value—5 to 7 dry, 3 or 4 moist

Chroma—2 or 3

Structure—granular, platy, single grained, or massive

Reaction—slightly acid or neutral

#### Bt horizons:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4

Texture—sandy clay loam; sandy clay common in the lower subhorizons

Structure—angular or subangular blocky

Reaction—neutral or mildly alkaline

#### Bq horizon:

Value—6 or 7 dry, 4 or 5 moist

Chroma—3 or 4 dry or moist

Texture—gravelly sandy loam or gravelly loamy sand

Rock fragments—15 to 35 percent pebbles

Reaction—neutral to moderately alkaline

Carbonates—noneffervescent to strongly effervescent

Other important features—20 to 75 percent durinodes in a friable matrix or discontinuous weak silica cementation

The Wedlar soils in this survey area have more carbonate than is defined as the range for the series. This difference, however, does not significantly affect the use or management of the soils.

## Wellsed Series

The Wellsed series consists of moderately deep, well drained soils that formed in alluvium derived predominantly from granitic rocks. These soils are on old alluvial fans, fan piedmonts, and ballenas. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 51 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Durargids

**Typical pedon:** Wellsed gravelly fine sand, 2 to 8 percent slopes, in an area of rangeland in the Wellsed-Wedlar association:

- A1**—0 to 2 inches; pale brown (10YR 6/3) gravelly fine sand, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 15 percent pebbles; neutral (pH 7.3); abrupt smooth boundary.
- A2**—2 to 7 inches; pale brown (10YR 6/3) gravelly loamy fine sand, brown (10YR 4/3) moist; moderate very thick platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine vesicular pores; 20 percent pebbles; neutral (pH 7.3); abrupt smooth boundary.
- Bt1**—7 to 13 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine tubular pores; common thin clay films lining pores; few thin clay films on faces of peds; 20 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary.
- Bt2**—13 to 17 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular and interstitial pores; few thin clay films lining pores; 20 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary.
- Bk**—17 to 22 inches; very pale brown (10YR 7/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine interstitial and tubular pores; 20 percent pebbles; few thin lime filaments and few thin lime coatings on pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

- Bqk**—22 to 25 inches; very pale brown (10YR 7/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine interstitial and tubular pores; 30 percent pebbles; few thin clay films tonguing into fractures and pores; many weakly cemented discontinuous lenses; common lime and silica pendants on rock fragments; slightly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.
- Bqkm**—25 to 45 inches; strongly cemented duripan with a continuous thin indurated laminar cap; very hard, very firm; strongly effervescent.
- 2Bqk**—45 to 60 inches; light yellowish brown (10YR 6/4) gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, firm and brittle, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 25 percent pebbles, 5 percent cobbles; common thin lime and silica pendants on rock fragments; common weakly cemented discontinuous lenses; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** Mineral County, Nevada; about 2,400 feet south and 500 feet east of the northwest corner of sec. 19, T. 6 N., R. 28 E.; 38 degrees, 21 minutes, 59 seconds north latitude and 118 degrees, 53 minutes, 55 seconds west longitude.

### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 53 to 57 degrees F

**Depth to indurated duripan:** 20 to 40 inches

**Control section:** Clay content—20 to 35 percent

**A horizon:**

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Structure—granular, platy, or single grained

Reaction—slightly acid or neutral

**Bt horizon:**

Hue—10YR or 7.5YR

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 to 5

Structure—angular or subangular blocky

Reaction—mildly alkaline to strongly alkaline

Rock fragments—15 to 35 percent fine pebbles

**Bqk horizon:**

Value—6 to 8 dry, 4 to 6 moist

Chroma—3 or 4

Rock fragments—5 to 35 percent fine pebbles; as

much as 50 percent fine pebbles in subhorizons of some pedons

Reaction—strongly alkaline or very strongly alkaline

### **Whilphang Series**

The Whilphang series consists of shallow, well drained soils that formed in residuum and colluvium derived from Tertiary lacustrine sediments with admixtures of mixed alluvial material. These soils are on pediments and pediment remnants overlain by fan piedmonts. Slopes are 4 to 50 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents

**Typical pedon:** Whilphang very gravelly sandy loam, 8 to 30 percent slopes, in an area of rangeland in the Armespan-Whilphang-Wrango association, where pebbles cover about 60 percent of the surface, cobbles about 5 percent, and stones about 1 percent:

A1—0 to 1 inch; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine interstitial pores; 50 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2—1 to 4 inches; light gray (10YR 7/2) gravelly loam, brown (10YR 5/3) moist; moderate thin platy structure; hard, very friable, sticky and slightly plastic; common very fine roots; common very fine vesicular and few very fine interstitial pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

A3—4 to 11 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine to coarse roots; common very fine interstitial pores; 15 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr—11 inches; highly fractured mudstone with lime and discontinuous 1- to 2-millimeter silica coatings in fractures; many roots in fractures.

**Type location:** Mineral County, Nevada; about 2,600 feet north and 300 feet west of the southeast corner of sec. 8, T. 7 N., R. 37 E.; 38 degrees, 29 minutes,

9 seconds north latitude and 117 degrees, 51 minutes, 3 seconds west longitude.

#### **Range in Characteristics**

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

**Soil temperature:** 54 to 59 degrees F

**Depth to soft bedrock:** 10 to 20 inches

**Control section:** Clay content—10 to 18 percent; content of rock fragments—15 to 35 percent

**Reaction throughout the profile:** Moderately alkaline or strongly alkaline

**Carbonates:** Strongly effervescent or violently effervescent

**A horizon:**

Value—6 or 7 dry, 4 or 5 moist

Chroma—2 or 3 dry or moist

### **Wiskiflat Series**

The Wiskiflat series consists of very deep, somewhat excessively drained soils that formed in alluvium derived predominantly from granitic rock sources with a component of volcanic ash throughout. These soils are on alluvial fans, inset fans, and fan aprons. Slopes are 2 to 15 percent. Mean annual precipitation is about 8 inches, and mean annual air temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, nonacid, mesic Xeric Torriorthents

**Typical pedon:** Wiskiflat gravelly loamy sand, 2 to 15 percent slopes, in an area of rangeland:

A1—0 to 10 inches; light brownish gray (10YR 6/2) gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; common very fine and fine roots; few medium and coarse roots; many very fine interstitial pores; 15 percent pebbles; neutral (pH 6.7); clear wavy boundary.

C1—10 to 30 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots and few fine and coarse roots; many very fine and fine interstitial pores; 40 percent pebbles; neutral (pH 6.8); clear smooth boundary.

C2—30 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 4/3) moist;

massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine and fine interstitial pores; 50 percent pebbles; neutral (pH 7.3).

**Type location:** Mineral County, Nevada; on the northwest side of Whiskey Flat; about 1,100 feet south and 300 feet east of the northwest corner of sec. 1, T. 6 N., R. 30 E.; 38 degrees, 24 minutes, 46 seconds north latitude and 118 degrees, 35 minutes, 35 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Mean annual soil temperature:* 55 to 59 degrees F

*Control section:* Texture of the fraction less than 2 millimeters—stratified sandy loam to coarse sand (averages sandy loam); clay content—5 to 10 percent; silt content—15 to 35 percent; content of rock fragments—35 to 60 percent, predominantly pebbles

#### A horizon:

Value—predominantly 6 dry and 4 moist; may be 5 dry and 3 moist in the top 2 or 3 inches in some pedons

#### C horizon:

Chroma—2 or 3 dry or moist  
Reaction—neutral or mildly alkaline

### Wrango Series

The Wrango series consists of very deep, excessively drained soils that formed in alluvium derived from mixed rock sources. These soils are on inset fans. Slopes are 2 to 8 percent. Mean annual precipitation is about 8 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Xeric Torriorthents

**Typical pedon:** Wrango very gravelly loamy sand, 2 to 8 percent slopes, in an area of rangeland in the Armespan-Whilphang-Wrango association:

A—0 to 4 inches; light brownish gray (10YR 6/2) very gravelly sandy loamy sand, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and few fine interstitial pores; 35 percent pebbles; strongly effervescent;

moderately alkaline (pH 8.3); clear smooth boundary.

C—4 to 10 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and few fine interstitial pores; 35 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Ck—10 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and common fine interstitial pores; 70 percent pebbles; lime pendants on pebbles; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; at the north end of Monte Cristo Valley; 2,500 feet north and 600 feet west of the southeast corner of sec. 14, T. 7 N., R. 37 E.; 38 degrees, 27 minutes, 43 seconds north latitude and 117 degrees, 49 minutes, 25 seconds west longitude.

#### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 59 degrees F

*Reaction throughout the profile:* Mildly alkaline or moderately alkaline

*Control section:* Texture—averages loamy coarse sand or sand; clay content—0 to 8 percent; content of rock fragments—60 to 75 percent

*Carbonates:* Slightly effervescent to violently effervescent

*Soil profile:* Value—6 or 7 dry, 3 or 4 moist; chroma—2 or 3

#### A horizon:

Structure—platy, subangular blocky, massive, or single grained

Carbonates—noncalcareous or slightly effervescent

### Zadvar Series

The Zadvar series consists of very shallow, well drained soils that formed in mixed alluvium derived from volcanic rock sources. These soils are on fan piedmont and alluvial fan remnants. Slopes are 2 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow  
Haploxerollic Durargids

**Typical pedon:** Zadvar gravelly fine sandy loam, 4 to 15 percent slopes, in an area of rangeland in the Belted-Zadvar association:

**A**—0 to 3 inches; light gray (10YR 7/2) gravelly fine sandy loam, grayish brown (10YR 5/2) moist; strong thick platy structure; hard, very friable, slightly sticky and nonplastic; few very fine roots; many very fine vesicular pores; 25 percent pebbles; moderately alkaline (pH 8.3); clear smooth boundary.

**Bt**—3 to 10 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine to coarse roots; common very fine tubular and few very fine vesicular pores; 20 percent pebbles; common thin clay films on faces of peds and few moderately thick clay films on faces of peds and in pores; 25 percent plates ¼ to 1 inch thick of strong to weak silica cementation; strongly effervescent in the lower part; moderately alkaline (pH 8.0); clear wavy boundary.

**Bqkm**—10 to 25 inches; white (10YR 8/2) duripan strongly cemented with continuous silica and lime, with discontinuous silica laminae; very pale brown (10YR 7/3) moist; massive parting to ½- to 1-inch plates in places; very hard, extremely firm and brittle; 15 percent pebbles, 5 percent cobbles; 15 percent manganese coatings in fractures and discontinuous ¼-inch bands in the upper 1 or 2 inches of the duripan; strongly effervescent; strongly alkaline (pH 8.7); gradual wavy boundary.

**Bqk**—25 to 60 inches; white (10YR 8/2) very gravelly sand, very pale brown (10YR 7/3) moist; massive; very hard to hard, extremely firm to firm; very few very fine roots in pockets of material weakly cemented with silica; common very fine and fine interstitial pores; 45 percent pebbles, 5 percent cobbles; 70 percent discontinuous strong and 30 percent weak silica cementation; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** Mineral County, Nevada; about 700 feet north and 700 feet east of the southwest corner of sec. 18, T. 2 N., R. 34 E.; 38 degrees, 1 minute, 28 seconds north latitude and 118 degrees, 14 minutes, 20 seconds west longitude.

#### Range in Characteristics

**Soil moisture:** Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative

between July and October due to convection storms  
**Soil temperature:** 53 to 59 degrees F

**Control section:** Clay content—18 to 27 percent; content of rock fragments—20 to 35 percent

**Depth to hardpan:** 10 to 14 inches

**A horizon:**

Value—6 or 7 dry (may be 5 in the upper part), 4 or 5 moist

Chroma—2 or 3

Reaction—mildly alkaline or moderately alkaline

Structure—single grained, granular, platy, or subangular blocky

**Bt horizon:**

Value—5 or 6 dry, 4 or 5 moist

Chroma—3 or 4

Reaction—mildly alkaline or moderately alkaline

Texture—clay loam or sandy clay loam

Rock fragments—10 to 30 percent, mainly pebbles

Clay content—generally averages 27 to 35 percent clay; more than 35 percent possible in some subhorizons

Carbonates—noncalcareous; slightly effervescent to strongly effervescent in the lower part of some pedons

Structure—prismatic or subangular blocky

**Bqk horizon:**

Reaction—moderately alkaline or strongly alkaline

Carbonates—strongly effervescent or violently effervescent

Texture—stratified sand, loamy sand, sandy loam

Rock fragments—35 to 65 percent, mainly pebbles

### Zyzzi Series

The Zyzzi series consists of well drained, moderately slowly permeable soils that are very shallow to weathered bedrock. These soils formed in residuum derived from granitic rock. They are on mountains. Slopes are 8 to 30 percent. Mean annual precipitation is about 9 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Zyzzi very gravelly sandy loam, 8 to 30 percent slopes, in an area of rangeland:

**A**—0 to 4 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and

nonplastic; few very fine roots; many very fine and fine interstitial pores; 45 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.

**Bt**—4 to 8 inches; brown (10YR 5/3) extremely gravelly sandy clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial and tubular pores; common thin and moderately thick clay films lining pores and coating faces of peds; 60 percent fine pebbles; neutral (pH 7.0); clear wavy boundary.

**Cr**—8 inches; weathered granite; common thin clay films in fractures in the upper 3 inches; few fine and medium roots extending into fractures.

**Type location:** Mineral County, Nevada; about 1,500 feet south and 700 feet east of the northwest corner of sec. 29, T. 10 N., R. 28 E.; 38 degrees, 42 minutes, 11 seconds north latitude and 118 degrees, 52 minutes, 21 seconds west longitude.

### Range in Characteristics

*Soil moisture:* Moist in winter and spring, dry in summer and fall, except for 10 to 20 days cumulative between July and October due to convection storms

*Soil temperature:* 53 to 57 degrees F

*Control section:* Clay content—20 to 35 percent; content of rock fragments—50 to 75 percent, mostly less than 5 millimeters in diameter

*Depth to paralithic contact:* 4 to 10 inches

*Reaction throughout the profile:* Neutral or mildly alkaline

*A horizon:*

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3

Rock fragments—35 to 80 percent, mostly less than 5 millimeters in diameter

*B2t horizon:*

Hue—10YR or 7.5YR

Value—4 or 5 dry, 3 or 4 moist

Chroma—3 to 5

Clay content—25 to 35 percent



# Formation of the Soils

---

Soil is a natural three-dimensional body on the earth's surface that is capable of supporting plants. It is a dynamic mixture of mineral material, organic matter, water, and air. Each soil has distinctive properties that are the product of environmental forces acting upon earthy material over a period of time.

The soils in the survey area differ from one another within relatively short distances. These differences are the result of the interaction of five soil-forming factors: (1) parent material, including its physical characteristics as well as its mineralogical and chemical composition; (2) climate, mainly temperature and precipitation; (3) relief; (4) biological forces, mainly the plant cover and the organisms living in and on the soil; and (5) the length of time the environmental forces have been acting on the soil material.

## Climate

Climate affects soil formation through its effect on vegetation, weathering, water movement, and erosion. The main climatic factors which influence soil formation in this area are precipitation, wind, and temperature.

The climate of the survey area is characterized by warm, dry summers and cool, moist winters. Temperatures and precipitation throughout the area vary considerably with elevation, aspect, and, to some degree, storm patterns. The average annual air temperature ranges from 55 degrees F at the lower elevations in the valleys to 43 degrees F or lower on the high mountain slopes. The average annual precipitation ranges from about 4 inches at the lower elevations to over 16 inches at the higher elevations. Major climatic variations are the result of the effects of topography and relief. Temperature decreases with increasing elevation. Precipitation increases with increasing elevation and is highest in the mountainous areas in the western part of the survey area. As a consequence, the soils of the area reflect a general zonation with respect to elevation. Precipitation

patterns, particularly as they relate to time of year and intensity of storms, play an important role in the formation of soils in this area.

The summer convection storms do not account for a very large amount of the total precipitation. Because of their intensity and their pattern of frequency over the years, however, these storms play an extremely important role in soil formation in this area. Unless they are protected by cover or are in a position with favorable relief, soils are subject to erosion. As a result, a large number of the soils in this survey area are relatively young.

At the lower elevations in the survey area, the average annual precipitation is only about 4 to 8 inches. Weathering of parent material is slow, leaching is incomplete, and eluviation and illuviation proceed at a very slow rate. The plant cover is sparse and consists mainly of drought- and salt-tolerant shrubs. Typically, the soils are low in organic matter content and have a thin, light colored A horizon. Soluble salts and calcium carbonate accumulate in the soil profile at a relatively shallow depth. Gynelle soils and other Typic Torriorthents reflect the type of soil formation in this arid part of the area.

At the mid elevations in the survey area, the average annual precipitation is about 8 to 12 inches. This results in deeper leaching of salts and calcium carbonate, decreased reaction, changes in the kind and density of vegetation, and a thicker, darker A horizon. Breko soils and other Xerollic Haplargids and Veet soils and other Xerollic Camborthids are typical of the soils that formed at these elevations.

At the higher elevations in the survey area, the average annual precipitation is about 12 to 16 inches and the temperature is lower than that at the mid and lower elevations. Leaching of salts and carbonates is more intensive, the soils are neutral or slightly acid, and the A horizon is thicker and higher in organic matter content. The vegetation is mostly pinyon and juniper, but at the highest elevations sagebrush and a variety of

grasses are common. Kiote and Nire soils and other Argic Pachic Cryoborolls are typical of the soils that formed at the higher elevations.

The effects of wind on soil formation in this area are exhibited in several ways. The presence of a desert pavement is typified by Belted soils and other Haplic Durargids and by Terlco soils and other Typic Natrargids. The movement and deposition of sand in sand sheets or sand dunes are characterized by Hawsley, Stumble, and Isolde soils and other Typic Torripsammets. The deposition of carbonate dust in areas of soils that formed in residuum of noncalcareous parent material has resulted in calcareous soils, such as Pumel soils and other calcareous Typic Torriorthents.

In winter, freezing and thawing occur throughout most of the survey area, except for those areas that are insulated by a snow cover. The effects of frost action include the heaving of plants and erosion of the surface soil resulting from solifluction. At some of the higher elevations, the process of freezing and thawing has fractured and displaced the bedrock.

In summer, the hot sun and lack of moisture drastically affect plant growth, especially at the lower elevations. This effect is shown both by a lack of plant variety and by root distribution. The lack of roots in the surface layer results in very low amounts of organic matter in the soils. This characteristic is evident in Gynelle and Inmo soils and in other Typic Torriorthents.

## Relief

Relief, through its effects on drainage, runoff, erosion, and exposure to the sun and wind, has had an important influence on soil formation in the survey area. The mountain ranges, piedmont slopes, and bolson and semi-bolson floors reflect the gross variations in relief within the area.

The mountain ranges are mainly characterized by steep relief. Runoff is generally rapid or very rapid, and the hazard of erosion is generally high. Erosion inhibits or prevents soil formation. Blacktop soils and other Lithic Torriorthents and Beelem soils and other Lithic Xeric Torriorthents are examples of soils on the less stable mountain slopes, where the processes of soil formation have been unable to act on the parent material long enough for any diagnostic horizons to form. Soil formation on unstable mountain surfaces that are subject to a high rate of geologic erosion is limited primarily to the accumulation of organic matter, which results in a dark surface layer. Nupart soils and other

Entic Haploxerolls are typical soils in these areas. A cambic or an argillic horizon has formed in the soils on the more stable mountain surfaces, where the rate of geologic erosion is slower. Downeyville soils and other Lithic Haplargids, Stewval and Gabbvally soils and other Lithic Xerollic Haplargids, Loomer and Brier soils and other Lithic Argixerolls, and Squawtip soils and other Typic Argixerolls are examples of soils that formed on the more stable mountain slopes and have an argillic horizon.

The higher concave and north-facing slopes commonly have pockets where snow remains into late spring and early summer. The soils in these areas support a dense stand of shrubs and grasses. They have a thick, dark A horizon with a high content of organic matter. Kiote soils and other Argic Pachic Cryoborolls and Snopoc soils and other Pachic Cryoborolls are examples of these soils.

The upper piedmont slopes are generally dissected. They have stable surfaces on fan remnants and have narrow, less stable inset fans and channels. The fan remnants have been relatively stable over a long period because of the routing of drainage water through the dissecting channels. The stability has allowed sufficient time for strong profile development. Unsel soils and other Duric Haplargids and Belted soils and other Haplic Durargids are examples of soils that formed on these surfaces. The inset fans are not as stable and have periodically received overflow from upslope areas. The soils in these positions commonly have cambic horizons. Annaw soils and other Typic Camborthids are typical of these soils. Soils in the channels periodically receive run-on and soil material from upslope areas. These soils are very unstable and have not formed diagnostic horizons. Izo soils and other Typic Torriorthents are typical of these soils. Fan skirts are coalescent extensions of inset fans, and the soils in these positions are very similar to those on the inset fans.

On the bolson floor of alluvial flats and on flood-plain playas that are perpendicular to the piedmont slope are nearly level, well drained soils that carry very low velocity floodwater and runoff, thus allowing some deposition of soil material. Slaw and Cirac soils and other Typic Torrifluents are typical soils in these areas. At the end of the flood-plain playas and alluvial flats and on lake plains adjacent to the playas, drainage is often restricted, runoff is very slow, and salts accumulate. Wabuska and Nuyobe soils and other Aeric Halaquepts typify the soils in these areas.

## Biological Forces

Plants, animals, insects, and microflora are important biological forces that affect soil formation in the survey area. Although mammals, such as badgers and ground squirrels, and insects, such as cicadas and ants, have had some effect on soil formation, plants appear to have had the major biological influence on the soils in the survey area.

Because of the intensity of summer storms, the vegetation is particularly important in this area as it helps to control erosion. Where vegetation is sparse, there is little cover and a high rate of geological erosion occurs. Pintwater soils and other Lithic Torriorthents and Izo soils and other Typic Torriorthents are examples of soils that formed in sparsely vegetated areas. In areas where the vegetative cover is thicker, the surface is protected from the intense rains and the roots help to protect the soil from erosion. Ravenswood soils and other Typic Argixerolls are examples of soils that formed in these areas.

Because of climatic differences, plants vary considerably in kind and amount as the elevation increases. On the bolson floors, fan piedmonts, and hills and mountains at low elevations, the main plants are drought- and salt-tolerant shrubs. Because of the scarcity of available moisture, plants cover only a small part of the surface. They add little organic matter to the soils and provide little protection from the wind, rain, and sun. Salt-tolerant shrubs also tend to recycle salts from the deeper layers to the surface soil.

The mountainous areas generally support a denser stand of shrubs, grasses, and, in places, trees. Because of the more abundant vegetation, the A horizon of the soils in these areas is thicker, higher in content of organic matter, and darker. Snopoc soils and other Pachic Cryoborolls are examples of soils that formed in mountainous areas.

## Parent Material

Parent material is the earthy material in which soils form. The physical and chemical composition of the parent material greatly influences soil formation. The main kinds of parent material in this survey area are residuum derived from volcanic, sedimentary, and plutonic rocks; alluvium; and eolian deposits with additions of volcanic ash.

The volcanic rock, including basalt, andesite, rhyolite, and silicic tuff, is the main source of parent material in the Broken Hills, Monte Cristo Mountains, Gabbs Valley Range, Gillis Range, Mount Montgomery, and the

Aurora and Candelaria hills areas (15). Volcanic rocks generally contain minerals which may weather to clay when time and climatic conditions are favorable. For this reason soils that formed in residuum and colluvium derived from this parent material and that are on sufficiently stable landforms for long periods have argillic horizons. Downeyville soils and other Lithic Haplargids and Bellehelen soils and other Lithic Argixerolls are examples of these soils.

The sedimentary formations, including dolomite, limestone, shale, slate, and chert, all exhibit varying degrees of metamorphism. They are a main source of parent material in the Pilot Mountains, Garfield Hills, Cedar Mountains, and southern Gabbs Valley Range (15). Some sedimentary rocks, such as chert, are high in content of carbonates. Because carbonates tend to inhibit the formation of argillic horizons, few soils with high amounts of carbonates in the parent material have argillic horizons. Kyler soils and other Lithic Xeric Torriorthents are examples of these soils. Soils that formed in noncalcareous parent material or parent material with a low content of carbonates may have argillic horizons if they are on stable landforms. Penelas soils and other Xerollic Haplargids are examples. Tertiary sedimentary rocks are throughout the survey area but are mainly in the Stewart Valley area. They consist primarily of lakebed deposits containing interbedded tuff, siltstone, sandstone, shale, and locally abundant fanglomerate and conglomerate (15). Tert and Whilphang soils and other Xeric Torriorthents and Roic soils and other Typic Torriorthents are typical of the shallow soils on unstable landform surfaces where soil formation is minimal.

The plutonic rocks, the predominant mineralogy of which is quartz monzonite (15), are a major source of parent material in the Wassuk Mountains, Excelsior Mountains, and the Gillis Range. The relatively large amount of quartz mineral and its resistance to weathering result in soils that have an abundance of coarse sand particles and fine pebbles. Uripnes soils and other Typic Torriorthents and Lazan and Powment soils and other Typic Xerorthents are examples. Plutonic rocks also contain minerals which may weather to clay when time and climatic conditions are favorable. For this reason soils that formed in this parent material and that are on stable slopes have argillic horizons. Armoine and Zyzzi soils and other Xerollic Haplargids are examples.

Alluvium deposited as alluvial fans, fan piedmonts, fan skirts, lake plains, and alluvial flats consists of sandy, loamy, silty, or clayey material that is of generally mixed mineralogy and that has eroded from

the adjacent mountains. Alluvium deposited on fans and fan piedmonts is mostly loamy or sandy and has varying amounts of pebbles, cobbles, and stones. Soils closer to the mountains on fan piedmonts and alluvial fans generally formed in parent material that is higher in content of rock fragments. Gynelle soils and other Typic Torriorthents are examples. As distance from the mountains increases, the content of rock fragments in the parent material generally decreases. Sodaspring soils and other Typic Torriorthents are typical of soils with a lower content of rock fragments.

Eolian material, consisting mainly of sand, has been deposited in large areas of Gabbs Valley, Soda Spring Valley, Huntoon Valley, and valleys north and east of Walker Lake. These deposits occur as sand sheets, most of which have been reworked by wind and water, and as dunes. Examples of soils that formed in this material are Stumble, Hawsley, Sundown, and Isolde soils and other Typic Torripsammets.

Volcanic ash, primarily from the Mono-Inyo crater areas, has affected soil formation in this area. It has served as a source of silica in the formation of soils with silica-cemented layers, such as Hottle Variant soils and other Aridic Duric Haploxerolls and Fadoll soils and other Xeric Torriorthents. Also, it has reduced the organic matter content in the surface layer of soils that would have normally had a thick, dark surface layer. Examples are Wassit soils and other Lithic Mollic Haploxeralfs, Katyblay soils and other Andeptic Cryoboralfs, and Brawley soils and other Typic Palixeralfs.

## Time

Time is required for the formation of soils. Soils underlain by sedimentary or igneous rocks began to form after the parent rock weathered to permeable material. The thickness and other characteristics of the A and B horizons reflect the relative age of the soil.

The soils in this survey area range from a few years to possibly a few hundred thousand years old. This range is a major reason for the many kinds of soils in the survey area.

The interrelations between time and the other soil-forming factors are not well understood by soil scientists and geologists working in this field. Many think that weathering of parent material and soil profile development have been essentially continuous, with little change in rate throughout the Quaternary (11, 12, 16, 20). Recently, earth scientists concerned with differentiating Quaternary deposits have proposed that soil development has not proceeded continuously at the

same rate but has taken place intermittently at rapid rates (8, 9, 10, 14). Concepts of soil stratigraphy use weathering profiles as stratigraphic markers to differentiate and correlate Quaternary deposits. These concepts of soil formation are based on the assumption that weathering profiles formed in response to infrequent combinations of climatic factors that induced minimal erosion and deposition and a greatly accelerated rate of chemical weathering.

Although scientists disagree as to the relative influence of time and other soil-forming factors, the concept of intermittency of soil formation has been supported by numerous studies and provides a practical technique to discuss the age of soils in this survey area in terms of geologic and climatic factors in the Quaternary.

The kinds of diagnostic subsurface horizons and other subsurface diagnostic properties, together with their strength of expression, provide general clues to the age of the soils in the area. Important subsurface diagnostic horizons in the soils include argillic, natric, cambic, and calcic horizons and horizons exhibiting silica cementation.

Prominent argillic horizons in this area are believed to occur generally only in soils formed primarily during the Pleistocene. This concept has been established by studies in the Southwest (4, 5) and is further supported in *Soil Taxonomy* (18). If soil-forming conditions remain constant, argillic horizons become finer in texture with increasing age, become somewhat thicker, and tend to develop abrupt upper boundaries. Weakly expressed, thin argillic horizons may have formed during the very late Pleistocene or early Holocene.

Natric horizons are special kinds of argillic horizons that formed under the influence of a high content of exchangeable sodium. The effect of sodium on the dispersion of clay may tend to accelerate the rate at which argillic horizons form. This acceleration is believed to be significant only in weakly expressed natric horizons that formed on Holocene surfaces. Following the formation of argillic horizons, prominent natric horizons may have developed as a result of sodium supplied by the deposition of surficial loess. This important present-day process affects the physical and chemical properties of the soils in the area.

Cambic horizons in soils within the survey area formed for the most part on Holocene surfaces. The original stratification is no longer evident, and carbonates have been removed from the upper horizons and redeposited in underlying horizons. Investigations in southern New Mexico indicate that the cambic horizons in that region are less than about 5,000 years old (3, 6).

Cambic horizons in this survey area and in other areas in northern Nevada are generally thought to be less than 10,000 and possibly less than 7,000 years old. This age has been determined mostly as a result of soil mapping in areas below the last high stage of Pleistocene Lake Lahontan (7, 8, 9, 10).

The youngest soils in the area are those which formed in recently transported alluvium or material which has been recently exposed by erosion. Izo soils and other Typic Torriorthents are examples of soils that formed in recent alluvium. Isolde soils and other Typic Torripsamments formed in recently deposited sandy eolian material. These soils show little or no evidence of profile development.

Somewhat older than the youngest soils are soils on fan skirts and alluvial flats. These soils have weakly expressed horizons. They may have cambic horizons or thin argillic horizons. The lower horizons have an

accumulation of calcium carbonates in the form of pendants on the rock fragments. Examples are Fawin soils and other Typic Camborthids.

Soils of intermediate age are more strongly developed than younger soils and have distinct horizons. These soils have thicker, well developed argillic horizons and may have durinodes, strongly developed hardpans cemented with silica and lime, or calcic horizons. Oricto soils and other Typic Haplargids, Candelaria soils and other Typic Calciorthids, and Beano soils and other Haplic Durargids are examples.

Soils on the oldest, most stable surfaces are characterized by strong profile development and have considerably more distinct horizons than those of younger soils. Examples are Antholop and Fulstone soils and other Abruptic Xerollic Durargids, Mopana soils and other Abruptic Aridic Durixerolls, and Brawley soils and other Mollic Palexeralfs.



# References

---

- (1) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vols., illus.
- (2) American Society for Testing and Materials. 1985. Standard test method for classification of soils for engineering purposes. ASTM Stand. D 2487.
- (3) Gile, L.H. 1966. Cambic and certain noncambic horizons in desert soils of southern New Mexico. *Soil Sci. Soc. Am. Proc.* 30: 773-781.
- (4) Gile, L.H., and R.B. Grossman. 1968. Morphology of the argillic horizon in desert soils of southern New Mexico. *Soil Sci.* 106: 6-15.
- (5) Gile, L.H., and J.W. Hawley. 1966. Periodic sedimentation and soil formation on an alluvial fan piedmont in southern New Mexico. *Soil Sci. Soc. Am. Proc.* 30: 261-268.
- (6) Gile, L.H., F.F. Peterson, and R.B. Grossman. 1966. Morphological and genetic sequences of carbonate accumulation in desert soils. *Soil Sci.* 101: 347-360.
- (7) Hawley, J.W. 1962. The late Pleistocene and recent geology of the Winnemucca segment of the Humboldt River Valley, Nevada. Ph.D. thesis, University of Illinois.
- (8) Morrison, R.B. 1964. Lake Lahontan: Geology of the Carson Desert, Nevada. U.S. Geol. Surv. Prof. Pap. 401, 156 pp., illus.
- (9) Morrison, R.B. 1964. Soil stratigraphy: Principles, applications to differentiation and correlation of Quaternary deposits and landforms, and applications to soil science. Ph.D. thesis, University of Nevada.
- (10) Morrison, R.B. 1965. Principles of Quaternary soil stratigraphy. *In* R.B. Morrison and M.E. Wright, Jr., eds., Quaternary soils. Internat. Assoc. Quaternary Res., VII Cong., Proc., Vol. 9, pp. 1-69.
- (11) Nikiforoff, C.C. 1942. Fundamental formula of soil formation. *Am. J. of Sci.* 240: 847-866.
- (12) Nikiforoff, C.C. 1949. Weathering and soil evolution. *Soil Sci.* 67: 219-223.
- (13) Peterson, Frederick F. 1981. Landforms of the Basin and Range Province defined for soil survey. *Nevada Agric. Exp. Stn. Tech. Bull.* 28, 52 pp., illus.
- (14) Richmond, G.M. 1962. Quaternary geology of the La Sal Mountains, Utah. U.S. Geol. Surv. Prof. Pap. 324, 135 pp., illus.
- (15) Ross, Donald C. 1961. Geology and mineral deposits of Mineral County, Nevada. *Nevada Bur. Mines Bull.* 58, 98 pp., illus.
- (16) Springer, M.E. 1953. Soil formation in the desert of the Lahontan Basin, Nevada. Ph.D. thesis, University of California.
- (17) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus.
- (18) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. *Soil Conserv. Serv., U.S. Dep. Agric. Handb.* 436, 754 pp., illus.

- (19) United States Department of Agriculture. National soils handbook. (Available in local offices of the Soil Conservation Service)
- (20) Ward, W.T. 1965. Soils of the Adelaide Area, South Australia, in relation to time. *In* R.B. Morrison and M.E. Wright, Jr., eds., Quaternary soils. Internat. Assoc. Quaternary Res., VII Cong., Proc., Vol. 9, pp. 293-306.

# Glossary

---

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial fan.** A semiconical, or fan-shaped, constructional, major landform that is mainly stratified alluvium with debris flow deposits in some areas. It is on the upper margin of a piedmont slope, and its apex is a source of alluvium debouching from a mountain valley into an intermontane basin. Also, a generic term for similar landforms in various other landscape positions.

**Alluvial flat.** The nearly level alluvial surface between a piedmont slope and the playa of a bolson or the axial-stream flood plain of a semi-bolson. This landform can include both recent and relict components.

**Alluvial plain.** A major landform of some basin floors, comprised of the flood plain of a major Pleistocene stream that crossed the floor or of a low-gradient fan-delta built by such a stream. It is distinguished from an alluvial flat by its relatively well sorted and stratified alluvium.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Animal-unit-month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Arroyo valley.** A small valley that is tributary to a major valley of a desert stream.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

**Back slope.** The slope component that is the steepest, straight to concave or merely concave middle portion of an erosional slope.

**Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

**Ballena.** A major landform comprising distinctively round-topped ridgeline remnants of fan alluvium. The broadly rounded shoulder slopes of the ridge meet from either side to form a narrow crest and merge smoothly with the concave back slopes. In ideal examples, the slightly concave foot slopes of adjacent ballenas merge to form a smoothly rounded drainageway.

**Bar (offshore and barrier).** A component landform comprised of elongated, commonly curving, low ridges of well sorted sand and gravel that stand above the general level of a bolson floor. It is the result of the wave action of a Pleistocene lake.

**Basal area.** The area of a cross section of a tree. It is a measure of stand density, commonly expressed in square feet. For pinyon pine and juniper stands, it is the section at a height of 1 foot and measured outside the bark.

**Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

- Basin.** A general term for an intermontane basin, a bolson, a semi-bolson, an area of centripetal drainage, or a structural depressional area.
- Basin floor.** The lowermost, nearly level major physiographic part of a bolson or semi-bolson. It includes all alluvial, eolian, and erosional landforms that are below the piedmont slopes.
- Basin-floor remnant.** A generally flat-topped erosional remnant of a basin floor that has been dissected by an axial stream.
- Beach plain.** A major landform of bolson floors comprised of numerous closely spaced offshore bars and intervening lagoons. It is the result of a receding Pleistocene lake.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bolson.** An internally drained intermontane basin.
- Bolson floor.** The specific identification of the floor of a bolson, as compared with the floor of a semi-bolson; both are basin floors.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Brush management.** Use of mechanical, chemical, or biological methods to reduce or eliminate competition of woody vegetation to allow understory grasses and forbs to recover or to make conditions favorable for reseeding. It increases production of forage, which reduces the hazard of erosion. Brush management may improve the habitat for some species of wildlife.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Cemented pan** (as a restrictive feature). A cemented pan is too close to the surface for the specified use.
- Channel.** The bed of a single or braided waterway that commonly is barren of vegetation. Channels form in young alluvium. They may be enclosed by banks or they may be splayed across a fan surface and slightly mounded above it. They may include bars and dumps of cobbles and stones. Channels, except flood-plain playas, are landform elements.
- Chemical treatment.** Control of unwanted vegetation by use of chemicals.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.
- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
- Coarse textured soil.** Sand or loamy sand.
- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Cobbly soil material.** Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.
- Colluvium.** Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Component landform.** A feature of the earth's surface that is part of a major landform and was created by partial dissection of the major landform or by alluvial or eolian accretion. A component landform is the smallest type of landform that can be described as a single unit. Its morphological parts are called landform elements. A side slope element can be subdivided into slope components.
- Conglomerate.** A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer material. Conglomerate is the consolidated equivalent of gravel.
- Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain

grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Consistence, soil.** The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

*Loose.*—Noncoherent when dry or moist; does not hold together in a mass.

*Friable.*—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

*Firm.*—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

*Plastic.*—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a “wire” when rolled between thumb and forefinger.

*Sticky.*—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

*Hard.*—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

*Soft.*—When dry, breaks into powder or individual grains under very slight pressure.

*Cemented.*—Hard; little affected by moistening.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coppice dune.** A small dune of fine grained soil material stabilized around shrubs or small trees.

**Corrosive.** High risk of corrosion to uncoated steel or deterioration of concrete.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Crest.** The slope component comprising a very narrow, commonly linear top of an erosional ridge, hill, mountain, or other landform.

**Crop residue management.** Returning crop residue to the soil. Crop residue management helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Cropping system.** Growing crops using a planned system of rotation and management practices.

**Crown.** The upper part of a tree or shrub, including the living branches and their foliage.

**Cutbanks cave.** The walls of excavations tend to cave in or slough.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deferred grazing.** Postponing grazing or resting grazing for a prescribed period.

**Depth to rock** (as a restrictive feature). Bedrock is too near the surface for the specified use.

**Desert pavement.** A layer of gravel or coarser fragments on a desert soil surface that was emplaced by the upward movement of fragments from underlying sediment or that remains after finer particles have been removed by running water or wind.

**Desert stream valley.** A valley cut through several desert semi-bolsions by a perennial, mountain-fed stream.

**Desert varnish.** A glossy sheen or coating on stones and gravel in arid regions.

**Drainage class** (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

*Excessively drained.*—These soils have very high and high hydraulic conductivity and low water-holding capacity. They are not suited to crop production unless irrigated.

*Somewhat excessively drained.*—These soils have high hydraulic conductivity and low water-holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

*Well drained.*—These soils have intermediate water-holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

*Moderately well drained.*—These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

*Somewhat poorly drained.*—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

*Poorly drained.*—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

*Very poorly drained.*—These soils are wet to the surface most of the time. They are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Draw.** A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

**Droughty.** The soil holds too little water for plants during dry periods.

**Duff.** A term used to identify a generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Effervescence.** A soil quality measured when drops of diluted (1:10) hydrochloric acid (HCl) are added to the soil. The ratings are as follows:

Very slightly effervescent . . . . .	few bubbles
Slightly effervescent . . . . .	bubbles readily
Strongly effervescent . . . . .	bubbles form low foam
Violently effervescent . . . . .	bubbles form thick foam quickly

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Ephemeral stream.** A stream or reach of a stream that flows only in direct response to precipitation. It receives no long-continued supply from melting

snow or other source, and its channel is above the water table at all times.

**Erodes easily** (as a restrictive feature). Water erodes the soil easily.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion* (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

**Erosion pavement.** A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting. Synonym: scarp.

**Excess fines** (as a restrictive feature). Excess silt and clay are in the soil. The soil does not provide a source of gravel or sand for use in construction.

**Excess lime** (as a restrictive feature). The soil has excess carbonates that restrict the growth of some plants.

**Excess salt** (as a restrictive feature). The soil has excess water-soluble salts that restrict the growth of most plants.

**Excess sodium** (as a restrictive feature). The soil has excess exchangeable sodium that restricts the growth of plants.

**Extrusive rock.** Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

**Fan apron.** A component landform consisting of a sheetlike mantle of relatively young alluvium that partially covers the surface of an older fan piedmont or, in some places, an alluvial fan. A fan apron buries a pedogenic soil.

**Fan collar.** A component landform comprised of a thin, short, relatively young mantle of alluvium along the very upper margin of a major alluvial fan at a mountain front. The mantle somewhere buries a pedogenic soil that can be traced to the edge of the fan collar where it emerges as the land surface, or relict soil.

**Fanlette.** A very small, normally undissected alluvial fan, something less than a few tenths of a square mile in area, that may occur below a gully, inset fan, or ravine in a variety of positions on the piedmont slope or within mountain valleys.

**Fan piedmont.** The most extensive major landform of most piedmont slopes. It is formed by the lateral coalescence of mountain-front alluvial fans into one generally smooth slope and by accretion of fan aprons. Fan piedmonts commonly are complexes of many component landforms.

**Fan remnant.** A generic term for a component landform that is the remainder of various older fans that have been dissected (erosional fan remnants) or partially buried (nonburied fan remnants). Erosional fan remnants have a flattish summit that consists of a relict fan surface; nonburied fan remnants consist entirely of a relict fan surface.

**Fan-remnant side slope.** A landform element comprised of the relatively young erosional slope around the sides of an erosional fan remnant. It is composed of shoulder slopes, back slopes, and foot slopes.

**Fan skirt.** A major landform comprised of laterally coalescing, small alluvial fans that originate from gullies that are cut into or that extend from inset fans of a fan piedmont and merge along their toe slopes with the basin floor. Fan skirts are smooth or only slightly dissected.

**Fine textured soil.** Sandy clay, silty clay, and clay.

**Flood plain.** The transversely level floor of an axial stream of a semi-bolson or of a major desert stream valley that is occasionally or regularly alluviated by the stream overflowing its channel during periods of flooding.

**Flood-plain playa.** A component landform consisting of very low gradient, barren, axial stream segments in an intermontane basin. It is subject to broad and shallow floods and is veneered with barren, fine textured sediment that crusts. A flood-plain playa commonly is segmented by transverse, narrow bands of vegetation, and it may alternate with ordinary, narrow or braided channel segments.

**Foothill.** A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

**Foot slope.** The relatively gently sloping, slightly concave slope component of an erosional slope that is at the base of the back slope component. Synonym: pediment.

**Forb.** Any herbaceous plant not a grass or a sedge.

**Frost action** (as a restrictive feature). The moisture in the soil freezes and thaws. Frost action can damage roads, buildings, and other structures.

**Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

**Gravel.** Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter. Very gravelly soil material is 35 to 60 percent of these rock fragments, and extremely gravelly soil material is more than 60 percent.

**Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Hard to pack** (as a restrictive feature). The soil is difficult to compact.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:  
*O horizon.*—An organic layer of fresh and decaying plant residue.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified

organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

**B horizon.**—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

**E horizon.**—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

**C horizon.**—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

**R layer.**—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally,

material is removed from an upper horizon and deposited in a lower horizon.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Inset fan.** The flood plain of a commonly ephemeral stream that is confined between fan remnants, basin-floor remnants, ballenas, or closely opposed fan toe slopes. Its transversely level cross section is evidence of alluviation of a fluve. It is wide enough that raw channels cover only a fraction of its surface.

**Interdune flat.** That portion of an alluvial flat that is exposed among sand dunes that have been emplaced over it.

**Intermittent stream.** A stream or reach of a stream that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Interplateau basin.** A depressional area on a plateau summit. Depth to the plateau bedrock is greater in this area than on the surrounding summit.

**Irrigation.** Application of water to soils to assist in production of crops.

**Lacustrine deposit (geology).** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lake plain.** A major landform of some bolson floors that is nearly level and consists of fine textured, stratified bottom sediment of a Pleistocene lake.

**Lake-plain terrace.** A somewhat elevated area and component landform of a lake plain.

**Landform element.** The morphological part of a component landform. Side slope landform elements may be subdivided into slope components.

**Large stones (as a restrictive feature).** The soil has rock fragments that are 3 inches (7.5 centimeters) in diameter or more.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Light textured soil.** Sand and loamy sand.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Low strength** (as a restrictive feature). The soil is not strong enough to support loads.

**Major landform.** A subdivision of the piedmont slope or basin floor major physiographic part that reflects a major morphogenetic process taking place over a long period or that is the result of a special erosional or depositional process. Many major landforms are dissected, and their original area is occupied by component landforms.

**Major physiographic part.** The very large part of an intermontane basin that is characterized by dominant slope and position and is comprised of major landforms (i.e., steeply sloping mountains that stand above less sloping piedmonts that in turn grade to nearly level basin floors).

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, or other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, and fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, and silty clay loam.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain.** A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can

occur as a single, isolated mass or in a group forming a chain or range.

**Mountain-valley fan.** A major landform that is the result of alluvial filling of a mountain valley or intramontane basin by coalescent valley-side slope fans whose toe slopes meet from either side of the valley along an axial drainageway. It is an extension of the upper piedmont slope into mountain valleys. Most mountain-valley fans have been dissected.

**Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

**Munsell notation.** A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Neutral soil.** A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Observed rooting depth.** Depth to which roots have been observed to penetrate.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Parent ballena.** A spur, with a fully rounded crest, that is connected to an erosional fan remnant large enough that some relict fan surface is preserved on the remnant summit.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** The foot slope component of an erosional slope.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Permafrost.** Layers of soil, or even bedrock, occurring

in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

**Permeability.** The quality of the soil that enables water to move downward through the profile.

Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow . . . . .	less than 0.06 inch
Slow . . . . .	0.06 to 0.2 inch
Moderately slow . . . . .	0.2 to 0.6 inch
Moderate . . . . .	0.6 inch to 2.0 inches
Moderately rapid . . . . .	2.0 to 6.0 inches
Rapid . . . . .	6.0 to 20 inches
Very rapid . . . . .	more than 20 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piedmont slope.** A major physiographic part of an intermontane basin that comprises all of the constructional and erosional, major and component landforms from the basin floor to the mountain front and into alluvium-filled mountain valleys.

**Piping.** Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Plain.** A flat, undulating or rolling area, large or small, that includes few prominent hills or valleys. It generally is at a low elevation in relation to surrounding areas, and it may have considerable overall slope and local relief.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Playa.** An ephemerally flooded, barren area on a basin floor that is veneered with fine textured sediment and acts as a temporary or final sink for drainage water.

**Ponding.** Standing water on soils in closed depressional areas. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Potential native plant community.** The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

**Potential rooting depth (effective rooting depth).**

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Range condition.** The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Range site.** An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are—

Extremely acid .....	below 4.5
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Medium acid .....	5.6 to 6.0
Slightly acid .....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Mildly alkaline .....	7.4 to 7.8
Moderately alkaline .....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline .....	9.1 and higher

**Relict.** Old, or remaining from previous times; in the present context, of Pleistocene age.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Remnant.** The remainder of a larger landform or of a land surface that has been dissected or partially buried.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Ridgeline remnant.** A narrow ridge that has a fully rounded crest and is accordant with the crests of similar, nearby ridges. Together these accordant crests approximately mark the position of a pre-existing land surface that has been destroyed by dissection.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rooting depth** (as a restrictive feature). The soil is shallow to a layer that greatly restricts roots; shallow root zone.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Six classes of runoff are recognized:

*Ponded.*—Little of the precipitation and run-on escapes as runoff, and free water stands on the surface for significant periods. The amount of water that must be removed from ponded areas by movement through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs in level to nearly level depressional areas, and the water depth may fluctuate greatly.

*Very slow.*—Surface water flows away slowly, and free water stands on the surface for long periods

or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils commonly are level or nearly level or are very open and porous.

*Slow.*—Surface water flows away slowly enough that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils commonly are either nearly level or very gently sloping or they are steeper but absorb precipitation very rapidly.

*Medium.*—Surface water flows away fast enough that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils commonly are either nearly level or gently sloping and absorb precipitation at a moderate rate or they are steeper but absorb water rapidly.

*Rapid.*—Surface water flows away fast enough that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep, and they have a moderate to slow rate of absorption.

*Very rapid.*—Surface water flows away so fast that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep, and they absorb precipitation slowly.

**Run-on.** Soil moisture received as runoff from adjacent areas.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium. The conductivity of extract, in millimhos per centimeter, is expressed as—

Nonsaline .....	0 to 4
Slightly saline .....	4 to 8
Moderately saline .....	8 to 16
Strongly saline .....	more than 16

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sand dune.** A component landform made up of eolian, sand-sized mineral particles. Dunes commonly are on the leeward side of a Pleistocene lakebed.

**Sand sheet.** A major landform comprising an extensive layer, several feet thick, of eolian sand from pluvial

lake beaches, sometimes partly redeposited by water. It is spread across alluvial flats, onto piedmont slopes, or over low mountains and has an undulating and commonly duned surface.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage.** The movement of water through the soil. Seepage adversely affects the specified use of the soil.

**Semi-bolson.** An externally drained intermontane basin.

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the substratum. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Shoulder slope.** The convex slope component at the top of an erosional side slope.

**Shrink-swell** (as a restrictive feature). The soil shrinks when dry and swells when wet.

**Side slope.** The erosional slope around the sides of an erosional fan remnant, hill, ballena, mountain, or other landform. It is composed of shoulder slopes, back slopes, foot slopes, and toe slopes. Also, the planimetrically linear parts of the slopes around a digitately dissected fan remnant or hill or other landform as compared with the planimetrically convex nose slope and concave head slope parts.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Site index.** A designation of the quality of a forest site. For pinyon pine and juniper stands, it is based on tree diameter at a height of 1 foot and the spacing between trees.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level.....	0 to 2 percent
Gently sloping .....	2 to 4 percent
Moderately sloping .....	4 to 8 percent
Strongly sloping.....	8 to 15 percent
Moderately steep .....	15 to 30 percent
Steep.....	30 to 50 percent
Very steep .....	50 to 75 percent
Extremely steep.....	more than 75 percent

**Slope component.** A morphological element of an erosional slope and a morphological subdivision of the side slope landform element.

**Small stones** (as a restrictive feature). The soil has rock fragments that are less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are—

Nonsodic.....	less than 13:1
Slightly sodic .....	13-46:1
Strongly sodic .....	more than 46:1

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in

millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay .....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the substratum. The living roots and plant and animal activities are largely confined to the solum.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Stony soil material.** Material, commonly a subsurface layer, that contains a specified amount of rock fragments that are mainly 10 to 24 inches in diameter. The amount of these fragments, by volume, is expressed as—

Stony .....	.01 to 3 percent
Very stony .....	3 to 15 percent
Extremely stony .....	more than 15 percent

**Stream terrace.** A transversely level erosional remnant of a former axial stream or major desert stream flood plain that slopes in the same direction as the adjacent, incised stream and is underlain by well sorted, stratified sand and gravel or by loamy or clayey sediment.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Substratum.** The part of the soil below the solum.

**Summit.** The flattish top of an erosional fan remnant, hill, mountain, or other landform. The term is used for both a landform element and a slope component.

**Tailwater.** The water just downstream of a structure.

**Talus.** Rock fragments of any size or shape, commonly coarse and angular, derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose, broken rock formed chiefly by falling, rolling, or sliding.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

**Terrace.** Any part of a general slope that stands above a short, steep scarp and has a generally flat, nearly level or gently sloping summit. It may have another short scarp above the summit. Synonym: bench.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Toe slope.** The lowest part of a foot slope component of an erosional slope. It is distinguished from the upper part of a foot slope by a greater accumulation of pedisegment. Also, the lowest and most gently sloping part of a slope.

**Tuff.** A compacted deposit that is 50 percent or more volcanic ash and dust.

**Valley.** An elongated depressional area cut by stream erosion and the associated water erosion of its side slopes (stream valley). Also used to describe intermontane and intramontane basins.

**Variant, soil.** A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

**Variegation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Water-supplying capacity.** Refers to the amount of water available in the soil for plant growth in a normal year from the total of precipitation, run-on, and a capillary fringe minus runoff.

**Water table.** The upper level of ground water or that level below which the soil is saturated.

**Water table (perched).** The water table of a saturated layer of soil that is separated from an underlying saturated layer by an unsaturated layer.

**Weathering.** All physical and chemical changes

produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

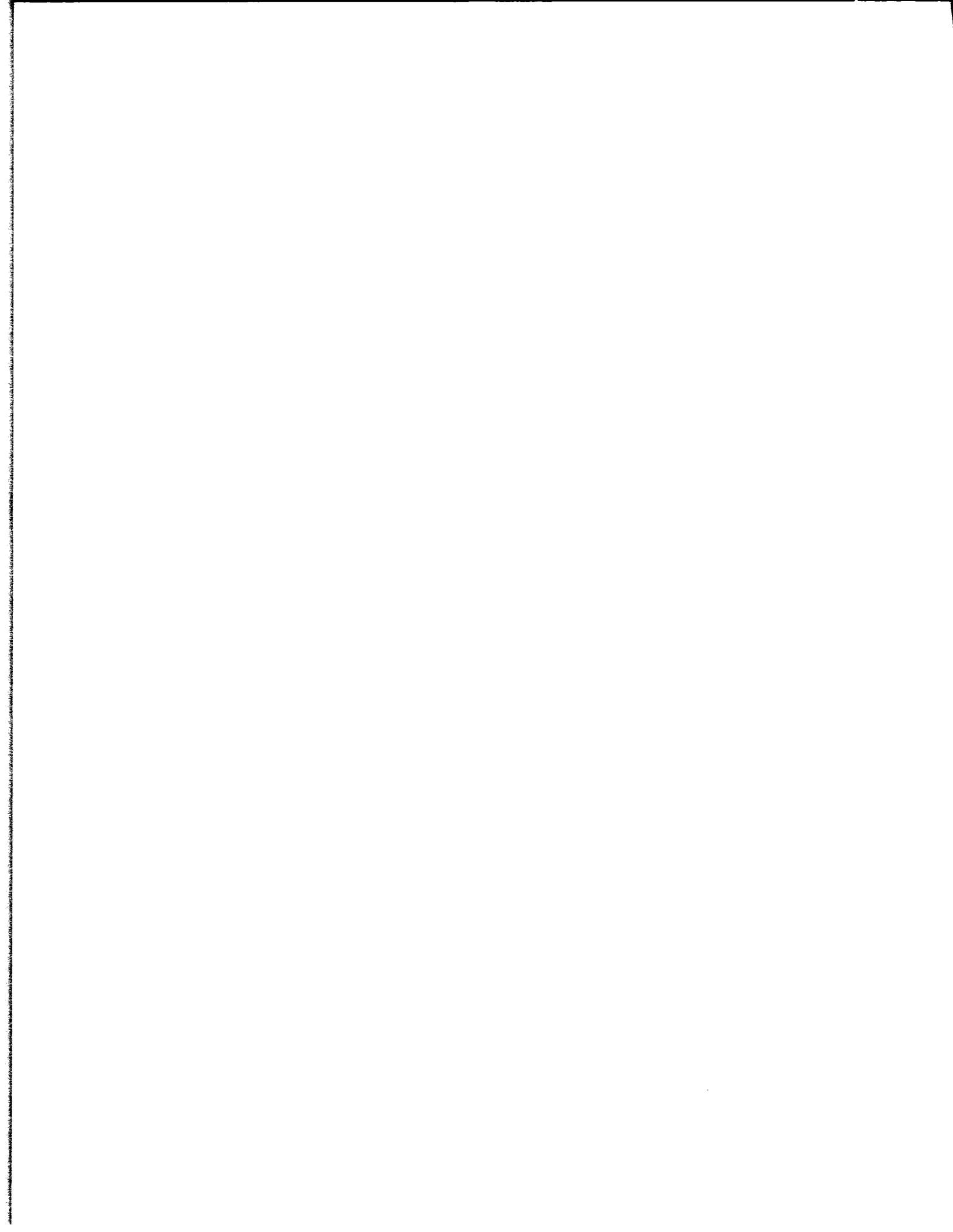


United States  
Department of  
Agriculture

Soil  
Conservation  
Service

In cooperation with  
United States Department  
of the Interior, Bureau of  
Land Management and  
Bureau of Indian Affairs;  
United States Department  
of Agriculture, Forest  
Service; and University of  
Nevada, Agricultural  
Experiment Station

# **Soil Survey of Mineral County Area, Nevada (Volume II)**



# Appendix

---

### Criteria Used in Rating Soils for Selected Uses Shallow Excavations

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Depth to bedrock (inches):				
Hard .....	>60	40-60	<40	Depth to rock.
Soft .....	>40	20-40	<20	Depth to rock.
3. Depth to cemented pan (inches):				
Thick .....	>60	40-60	<40	Cemented pan.
Thin .....	>40	20-40	<20	Cemented pan.
4. USDA texture (20 to 60 inches) ...	---	SI <sup>1</sup>	COS, S, FS, VFS, LCOS, LS, LFS, LVFS, G, SG	Cutbanks cave.
5. USDA texture (20 to 60 inches) ...	---	C, SIC	---	Too clayey.
6. Soil order .....	---	---	Vertisols	Cutbanks cave.
7. Bulk density (g/cc) .....	---	>1.8	---	Dense layer.
8. Unified (20 to 60 inches) .....	---	---	OL, OH, PT	Excess humus.
9. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	<25	25-50	>50	Large stones.
10. Depth to high water table (feet) ...	---	---	+	Ponding.
	>6	2.5-6	0-2.5	Wetness.
11. Flooding .....	None, rare, protected.	Common	---	Flooding.
12. Slope (percent) .....	0-8	8-15	>15	Slope.

<sup>1</sup> In areas of loess, rating should be *slight*.

<sup>2</sup> Weighted average to 40 inches.

**Local Roads and Streets**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Depth to bedrock (inches):				
Hard .....	>40	20-40	<20	Depth to rock.
Soft .....	>20	<20	---	Depth to rock.
3. Depth to cemented pan (inches):				
Thick .....	>40	20-40	<20	Cemented pan.
Thin .....	>20	<20	---	Cemented pan.
4. AASHTO group index number <sup>1 2</sup>	0-4	5-8	>8	Low strength.
5. AASHTO <sup>1 3</sup> .....	---	A-4, A-5	A-6, A-7, A-8	Low strength.
6. Depth to high water table (feet) ...	---	---	+	Ponding.
	>2.5	1.0-2.5	0-1.0	Wetness.
7. Slope (percent) .....	0-8	8-15	>15	Slope.
8. Flooding .....	None, protected.	Rare	Common	Flooding.
9. Potential frost action .....	Low	Moderate	High	Frost action.
10. Shrink-swell potential <sup>1</sup> .....	Low	Moderate	High	Shrink-swell.
11. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	<25	25-50	>50	Large stones.

<sup>1</sup> Thickest layer between 10 and 40 inches.

<sup>2</sup>  $GIN = (F-35)[.2 + .005(LL-40)] + .01 (F-15)(PI-10)$  where F = percent passing No. 200 sieve. If F is <35 and PI is >11, use only part 2 of equation. Use median values.

<sup>3</sup> Use AASHTO classification only when group index is not known.

<sup>4</sup> Weighted average to 40 inches.

## Roadfill

Property	Limits			Restrictive feature
	Good	Fair	Poor	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Depth to bedrock (inches) .....	>60	40-60	<40	Area reclaim.
3. AASHTO group index number <sup>1</sup> <sup>2</sup> ...	0-4	5-8	>8	Low strength.
4. AASHTO <sup>2</sup> <sup>3</sup> .....	---	A-4	A-5, A-6, A-7, A-8	Low strength.
5. Layer thickness (inches) .....	>60	30-60	<30	Thin layer.
6. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	<25	25-50	>50	Large stones.
7. Depth to high water table (feet) ....	>3	1-3	<1	Wetness.
8. Slope (percent) .....	0-15	15-25	>25	Slope.
9. Shrink-swell potential <sup>2</sup> .....	Low	Moderate	High	Shrink-swell.

<sup>1</sup>  $GIN = (F-35)[.2 + .005(LL-40)] + .01 (F-15)(PI-10)$  where F = percent passing No. 200 sieve. If F is <35 and PI is >11, use only part 2 of equation. Use median values.

<sup>2</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

<sup>3</sup> Use AASHTO classification only when group index is not known.

<sup>4</sup> Weighted average to 40 inches.

**Sand**

Property	Limits		Restrictive feature
	Probable source	Improbable source	
1. Unified <sup>1</sup> .....	SW, SP, SW-SM, SP-SM	---	---
	GW, GP, GW-GM, GP-GM <sup>2</sup>	---	---
	---	GW, GP, GW-GM, GP-GM <sup>3</sup>	Small stones.
	---	All other	Excess fines.
2. Layer thickness (inches) ....	---	<36	Thin layer.
	>36	---	---
3. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	---	>50	Large stones.
	<50	---	---

<sup>1</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

<sup>2</sup> Percent passing No. 4 sieve minus percent passing No. 200 sieve is greater than 25.

<sup>3</sup> Percent passing No. 4 sieve minus percent passing No. 200 sieve is less than 25.

<sup>4</sup> Thickest layer between 10 and 60 inches.

**Gravel**

Property	Limits		Restrictive feature
	Probable source	Improbable source	
1. Unified <sup>1</sup> .....	GW, GP, GW-GM, GP-GM	---	---
	SW, SP, SW-SM, SP-SM <sup>2</sup>	SW, SP, SW-SM, SP-SM <sup>3</sup>	Too sandy.
	---	All other	Excess fines.
2. Layer thickness .....	---	<36	Thin layer.
	>36	---	---
3. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	---	>50	Large stones.
	<50	---	---

<sup>1</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on bottom layer, verify thickness.

<sup>2</sup> 100 minus percent passing No. 4 sieve is greater than 25.

<sup>3</sup> 100 minus percent passing No. 4 sieve is less than 25.

<sup>4</sup> Thickest layer between 10 and 60 inches.

**Embankments, Dikes, and Levees**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Layer thickness (inches).....	>60	30-60	<30	Thin layer.
3. Unified <sup>1</sup> .....	---	---	GW, GP, SW, SP, GW-GM, GP-GM, SW-SM, SP-SM, SM, <sup>2</sup> GM	Seepage.
4. Unified <sup>1</sup> .....	---	GM, <sup>3</sup> CL <sup>4</sup>	ML, <sup>5</sup> SM, <sup>6</sup> SP, CL-ML	Piping.
5. Unified <sup>1</sup> .....	---	---	PT, OL, OH	Excess humus.
6. Unified <sup>1</sup> .....	---	---	MH, CH <sup>7</sup>	Hard to pack.
7. Fraction greater than 3 inches (percent by weight) <sup>8</sup> .....	<15	15-35	>35	Large stones.
8. Depth to high water table (feet) ...	---	---	+	Ponding.
Apparent.....	>4	2-4	<2	Wetness.
Perched .....	>3	1-3	<1	Wetness.
9. Sodium adsorption ratio (great group) .....	---	---	>12 (natric, halic)	Excess sodium.
10. Salinity (mmhos/cm) .....	<8	8-16	>16	Excess salt.

<sup>1</sup> Thickest layer between 10 and 60 inches.

<sup>2</sup> Rate *moderate* if more than 20 percent passing No. 200 sieve and *slight* if more than 30 percent passing No. 200 sieve.

<sup>3</sup> Rate *slight* if less than 35 percent passing No. 200 sieve, less than 50 percent passing No. 40 sieve, and less than 65 percent passing No. 10 sieve. The soil must meet all three criteria before it is rated *slight*.

<sup>4</sup> Rate *slight* if PI is greater than 15.

<sup>5</sup> Rate *moderate* if PI is greater than 10.

<sup>6</sup> Rate *moderate* if less than 70 percent passing No. 40 sieve and less than 90 percent passing No. 10 sieve, and rate *slight* if less than 60 percent passing No. 40 sieve and less than 75 percent passing No. 10 sieve.

<sup>7</sup> Rate *moderate* if PI is less than 40.

<sup>8</sup> Weighted average to 40 inches.

## Range Seeding

Property	Limits			Restrictive feature
	Good	Fair	Poor	
Moisture regime .....	Aquic, xeric, ustic, and xeric and ustic bordering on aridic or torric.	Aridic and torric bordering on aquic, xeric or ustic.	Aridic and torric.	Too arid.
Effective moisture <sup>1</sup> .....	>10 in. (25 cm)	7-10 in. (17.5-25 cm)	<7 in. (17.5 cm)	Too arid.
Available water capacity .....	Surface 10 in. (27 cm) >1.25 in. (3.2 cm). Soil profile > 4 in. (10.2 cm).	Surface 10 in. (25 cm) 0.75-1.25 in. (1.9-3.2 cm). Soil profile 2.5-4 in. (6.4-10.2 cm).	Surface 10 in. (25 cm) <0.75 in. (1.9 cm). Soil profile < 2-5 in. (6.4 cm).	Droughty.
Texture surface 7 in. (17.5 cm) .....	LVFS, COSL, SL, FSL, VFSL, L SIL, SCL, and CL SICL with <35% C.	VFS, LFS, SC, SIC, C and CL and SICL with >35% C.	LS, LCOS, FS, COS.	Too sandy. Too clayey.
Rock fragments in surface 7 in. (17.5 cm) .....	GR <35%; CB <15%; ST <3%. Total rock fragments <35%.	GR <35%; CB 15-35%; ST 3-15%. Total rock fragments <35%.	GR >35%; CB 35%; ST >15%. Total rock fragments >35%.	Small stones. Large stones.
Depth to abrupt A-B texture boundary <sup>2</sup> .....	>10 in. (25 cm)	>10 in. (25 cm)	<10 in. (25 cm)	Rooting depth.
Depth to bedrock or hardpan .....	>20 in. (50 cm)	10-20 in. (25-50 cm)	<10 in. (25 cm)	Depth to rock/pan.
Electrical conductivity-saturation extract-25°C .....	<2 mmhos/cm (0.2 s/m) in upper 20 in. (50 cm).	2-4 mmhos/cm (0.2-0.4 s/m) in upper 10 in. (25 cm) and 4-8 mmhos/cm (0.4-0.8 s/m) in 10-20 in. (25-50 cm).	>4 mmhos/cm (0.4 s/m) in upper 10 in. (25 cm) and/or >8 mmhos/cm (0.8 s/m) in 10-20 in. (25-50 cm).	Excess salt.
Sodium adsorption ratio .....	<8 in upper 20 in. (50 cm).	8-13 in upper 10 in. (25 cm) and <20 in 10-20 in. (25-50 cm).	>13 in upper 10 in. (25 cm) and/or >20 in 10-20 in. (25-50 cm).	Excess sodium.
K x % slope <sup>3</sup> .....	<4 <sup>4</sup> ; <6 <sup>5</sup>	4-6 <sup>4</sup> ; 6-8 <sup>5</sup>	>6 <sup>4</sup> ; >8 <sup>5</sup>	Erodes easily.
I x C <sup>6</sup> .....	<60	<60	>60	Soil blowing.
Soil surface morphological types <sup>7</sup> ..	Types I and II >60%; Type IV <5%; or with mollic epipedon <sup>8</sup>	Types I and II 20-60%; Type IV <10% <sup>8</sup>	Type III <60%; Type IV >10% <sup>8</sup>	Too crusty.

<sup>1</sup> Moisture from precipitation, run-on, and ground water budgeted to actual evapotranspiration.

<sup>2</sup> Rate Vertisols and Vertic subgroups as poor.

<sup>3</sup> Sheet and rill erosion hazard (bare soil).

<sup>4</sup> For ustic bordering on aridic or torric, and aridic or torric bordering on ustic moisture regimes.

<sup>5</sup> For xeric, xeric bordering on aridic or torric, and aridic or torric bordering on xeric moisture regimes.

<sup>6</sup> Wind erosion hazard (bare soil).

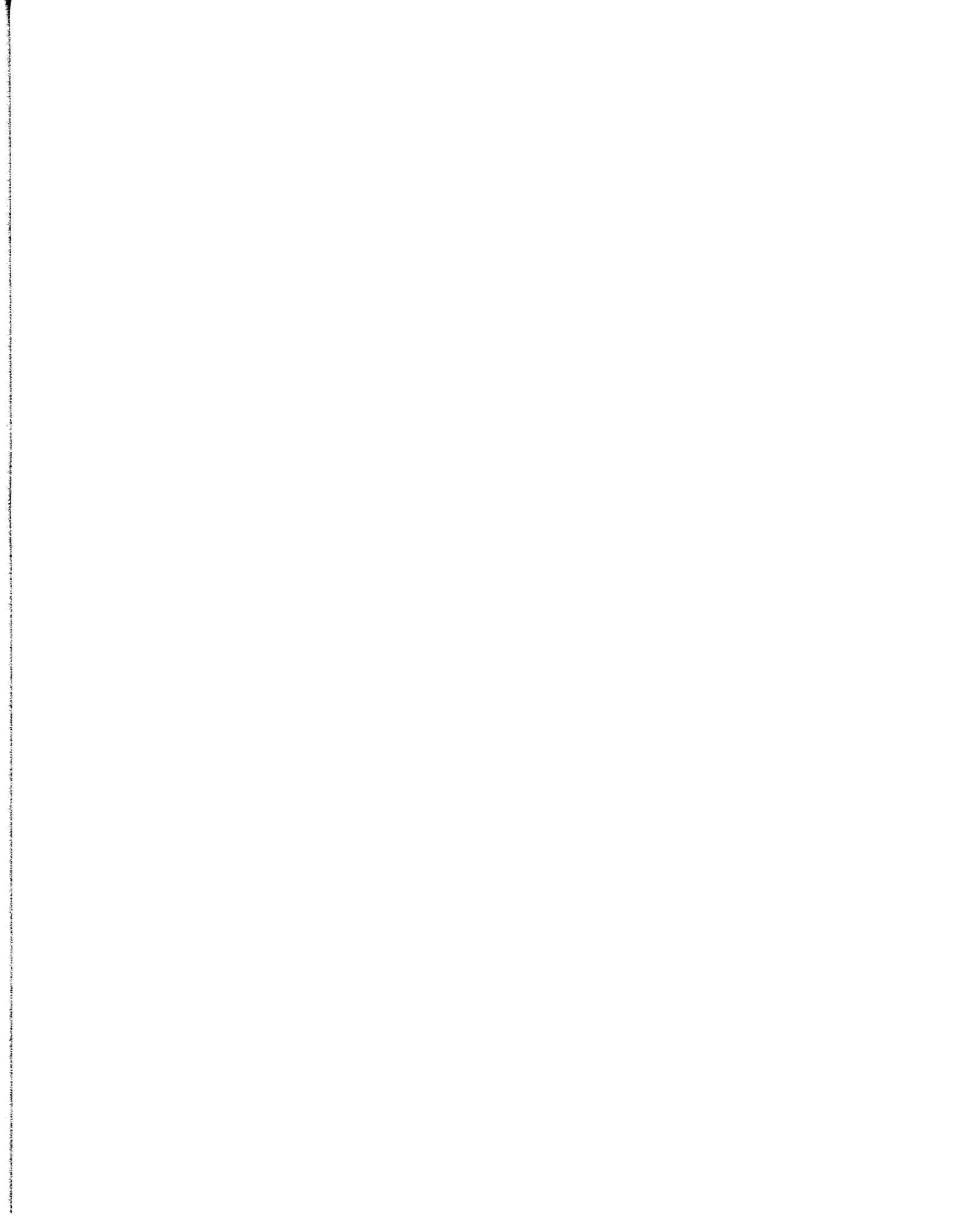
<sup>7</sup> See: (1) Final Report. Properties, Occurrence and Management of Soils with Vesicular Surface Horizons, 1977. Contract No. 52500-CT 5(N). USDI-BLM and UNR-Ag. Exp. Sta. Eckert, Peterson, Wood, and Blackburn; and (2) Final Report. Properties, Occurrence and Management of Soils with Vesicular Surface Horizons—Effects of Trampling on Seeding Emergence. 1979. Contract No. YA 512-CT 7-14. USDI-BLM and UNR-Ag. Exp. Sta. Stephens, Eckert, and Peterson.

<sup>8</sup> Soils without crusting morphology are to be included in Types I and II for rating.

**Guide for Estimating the Hazard of Erosion on Bare Soil in Nevada**

“K” means erosion factor K; “S” means percent slope; “I” means wind erodibility index; “C” means climatic factor.

	Water (K x S)	Wind (I x C)
Slight.....	<4	<60
Moderate.....	4-8	60-100
High.....	>8	>100



# Tables

---

TABLE 1.--TEMPERATURE AND PRECIPITATION  
(Recorded in the period 1951-80 at Mina, Nevada)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>Units</u>	<u>In</u>	<u>In</u>	<u>In</u>		<u>In</u>
January-----	46.3	20.4	33.4	65	-1	41	.33	.01	.56	1	1.8
February-----	52.8	25.2	39.0	70	7	81	.91	---	.74	1	1.7
March-----	58.1	28.4	43.3	78	11	160	.34	---	.60	1	1.6
April-----	65.4	34.8	50.1	85	19	317	.45	---	.77	1	.9
May-----	75.6	44.1	59.9	94	27	617	.60	.08	1.00	2	.3
June-----	86.3	53.1	69.7	102	37	891	.40	---	.71	1	.4
July-----	95.4	60.8	78.1	105	48	1,181	.45	.03	.76	1	.4
August-----	93.1	57.7	75.4	103	44	1,097	.42	---	.72	1	.0
September----	84.8	47.8	66.3	98	32	789	.37	---	.67	1	.0
October-----	72.5	37.5	55.0	89	21	465	.41	---	.69	1	.5
November-----	56.6	28.0	42.3	74	11	132	.32	---	.55	1	.4
December-----	47.7	21.3	34.5	64	1	32	.37	.02	.62	1	1.2
Yearly:											
Average----	69.6	38.3	53.9	---	---	---	---	---	---	---	---
Extreme----	---	---	---	105	-2	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,803	4.87	3.26	6.34	13	8.4

\* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL  
(Recorded in the period 1951-80 at Mina, Nevada)

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 11	May 14	May 27
2 years in 10 later than--	Apr. 30	May 7	May 20
5 years in 10 later than--	Apr. 9	Apr. 25	May 7
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 14	Oct. 3	Sept. 22
2 years in 10 earlier than--	Oct. 21	Oct. 9	Sept. 27
5 years in 10 earlier than--	Nov. 3	Oct. 21	Oct. 7

TABLE 3.--GROWING SEASON  
(Recorded in the period 1951-80 at Mina, Nevada)

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	<u>Days</u>	<u>Days</u>	<u>Days</u>
9 years in 10	168	150	126
8 years in 10	181	160	135
5 years in 10	207	178	152
2 years in 10	234	196	168
1 year in 10	247	205	177

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
202	Tornillo Variant fine sandy loam, 0 to 4 percent slopes-----	1,090	*
203	Toney Family, 2 to 8 percent slopes-----	4,797	0.2
205	Pedee Variant sand, 2 to 15 percent slopes-----	1,083	*
206	Bombadil-Acana Families association-----	8,578	0.4
207	Bulake Family, 8 to 30 percent slopes-----	67,372	2.9
208	Bregar Family, 2 to 15 percent slopes-----	2,489	0.1
211	Langston-Karpp Families association-----	5,764	0.3
213	Ratto-Vinini Families association-----	2,851	0.1
214	Watoopah Family, 2 to 8 percent slopes-----	10,279	0.4
216	Merino Family, 30 to 50 percent slopes-----	1,207	0.1
218	Ratto-Borealis Families association-----	6,329	0.3
301	Lazan Family-Powment association-----	38,418	1.7
302	Jenness Family, 0 to 4 percent slopes-----	7,294	0.3
304	Reese Family-Tornillo Variant-Kawich Family association-----	814	*
305	Sheeprock Family, 4 to 30 percent slopes-----	1,475	0.1
306	Baldy Variant silt loam, 0 to 4 percent slopes-----	523	*
307	Jenness Family-Fadoll association-----	8,076	0.4
502	Haggood Family, 4 to 15 percent slopes-----	2,429	0.1
504	Coutis Family, 15 to 50 percent slopes-----	2,846	0.1
505	Madeline-Bulake Families association-----	4,460	0.2
507	Clanalpine Family, 15 to 50 percent slopes-----	1,488	0.1
902	Lava flows-Lithic Xerorthents complex, 2 to 8 percent slopes-----	2,259	0.1
1032	Goldyke-Trocken association-----	6,935	0.3
1033	Goldyke-Blacktop-Koyen association-----	15,475	0.7
1040	Isolde-Hawsley association-----	12,082	0.5
1041	Isolde-Playas-Wabuska association-----	2,060	0.1
1042	Isolde-Dune land association-----	1,445	0.1
1043	Isolde-Cirac-Playas association-----	5,365	0.2
1044	Isolde-Patna-Hawsley association-----	3,665	0.2
1072	Rednik-Trocken-Bluewing association-----	18,800	0.8
1090	Singatse-Theon-Rock outcrop association-----	46,771	2.0
1091	Singatse-Gynelle-Izo association-----	3,065	0.1
1094	Singatse-Hawsley association-----	1,073	*
1121	Theon-Old Camp association-----	3,245	0.1
1127	Theon very gravelly sandy loam, 8 to 30 percent slopes-----	130	*
1130	Uripnes-Rock outcrop association-----	9,134	0.4
1131	Uripnes-Budihol-Rock outcrop association-----	1,370	0.1
1136	Uripnes-Pumel-Rock outcrop association-----	2,840	0.1
1138	Uripnes-Petspring-Rock outcrop association-----	6,615	0.3
1139	Uripnes-Zyzzi-Rock outcrop association-----	4,695	0.2
1140	Wabuska-Isolde association-----	1,025	*
1141	Wabuska-Playas-Isolde association-----	1,330	0.1
1142	Wabuska-Playas association-----	5,120	0.2
1151	Gynelle very gravelly loamy sand, sodic, 0 to 4 percent slopes-----	4,645	0.2
1153	Gynelle gravelly loamy sand, 2 to 4 percent slopes-----	7,715	0.3
1155	Gynelle-Izo association-----	49,895	2.2
1156	Gynelle-Izo association, strongly sloping-----	1,270	0.1
1171	Hawsley-Theon association-----	1,860	0.1
1172	Hawsley sand, 0 to 4 percent slopes-----	9,620	0.4
1173	Hawsley-Izo association-----	2,530	0.1
1174	Hawsley-Typic Torriorthents association-----	2,600	0.1
1180	Buckaroo-Bluewing association-----	575	*
1190	Old Camp-Theon-Rock outcrop association-----	2,140	0.1
1200	Playas-----	21,280	0.9
1201	Playas-Slaw association-----	4,375	0.2
1202	Dumps-Pits association-----	525	*
1205	Badland-----	1,195	0.1
1210	Trocken-Bluewing association-----	8,650	0.4
1221	Eastgate gravelly sandy loam, 0 to 4 percent slopes-----	6,350	0.3
1223	Eastgate-Cirac association-----	2,675	0.1
1240	Blacktop-Downeyville-Rock outcrop association-----	72,086	3.2
1241	Blacktop-Rock outcrop association-----	29,580	1.3
1243	Blacktop-Rodad-Theriot association-----	3,050	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
1280	Chill-Petspring association-----	1,005	*
1281	Chill-Beelem-Rock outcrop association-----	2,795	0.1
1282	Chill-Veet association-----	1,035	*
1283	Chill-Itme association-----	1,020	*
1290	Petspring-Rock outcrop-Budihol association-----	4,388	0.2
1291	Petspring-Uripnes-Beelem association-----	12,125	0.5
1301	Sundown loamy sand, 2 to 8 percent slopes-----	8,760	0.4
1310	Typic Torriorthents-Gynelle-Oricto association-----	3,100	0.1
1320	Belted-Downeyville association-----	5,170	0.2
1322	Belted-Annaw association-----	12,800	0.6
1323	Belted-Izo association-----	6,815	0.3
1324	Belted-Annaw association, stony-----	5,260	0.2
1325	Belted-Terlco-Izo association-----	4,985	0.2
1326	Belted-Breko association-----	460	*
1327	Belted-Lathrop association-----	1,055	*
1328	Belted-Zadvar association-----	1,455	0.1
1329	Belted-Koyen association-----	6,880	0.3
1340	Barnmot-Belted association-----	3,105	0.1
1341	Barnmot-Haarvar association-----	1,220	0.1
1342	Barnmot-Badland association-----	1,670	0.1
1350	Calpeak-Gabbvally-Tejabe association-----	5,660	0.2
1351	Calpeak-Goldyke association-----	2,250	0.1
1353	Calpeak-Goldyke-Gabbvally association-----	8,278	0.4
1354	Calpeak-Lomoine association-----	900	*
1361	Gabbvally-Tejabe-Mirkwood association-----	12,585	0.6
1362	Gabbvally-Gabbvally, very steep-Stewval association-----	31,024	1.4
1363	Gabbvally very stony loam, moist, 15 to 50 percent slopes-----	7,320	0.3
1365	Gabbvally-Rock outcrop association-----	4,810	0.2
1366	Gabbvally-Beelem-Rock outcrop association-----	2,952	0.1
1420	Dedmount-Slaw association-----	6,350	0.3
1440	Slaw-Isolde-Cirac association-----	5,784	0.3
1441	Slaw silt loam, 0 to 2 percent slopes-----	5,660	0.2
1442	Slaw-Playas association-----	1,515	0.1
1445	Slaw, reclaimed-Slaw-Fallon complex, 0 to 2 percent slopes-----	2,705	0.1
1450	Nuyobe-Playas association-----	3,940	0.2
1451	Nuyobe-Slaw association-----	1,590	0.1
1480	Fawin-Crunker association-----	1,630	0.1
1482	Fawin-Izo association-----	3,100	0.1
1483	Fawin fine sandy loam, 0 to 2 percent slopes-----	3,140	0.1
1490	Ratleflat-Crunker association-----	19,020	0.8
1492	Ratleflat-Wiskiflat association-----	6,865	0.3
1500	Chuckridge-Crunker association-----	1,290	0.1
1510	Advokay-Budihol-Pumel association-----	3,370	0.1
1511	Advokay sandy loam, moist, 2 to 8 percent slopes-----	1,020	*
1530	Dakent-Crunker association-----	3,615	0.2
1540	Beano-Annaw association-----	2,920	0.1
1551	Typic Torriorthents-Unsel association-----	2,100	0.1
1570	Budihol-Uripnes-Petspring association-----	7,280	0.3
1580	Rockabin-Hiridge association-----	4,670	0.2
1590	Snopoc-Rockabin-Fusuvar association-----	1,800	0.1
1591	Snopoc-Rockabin-Hiridge association-----	7,265	0.3
1600	Nupart-Lazan-Rock outcrop association-----	62,306	2.7
1601	Nupart-Rock outcrop association-----	1,410	0.1
1632	Annaw-Wardenot-Pintwater association-----	370	*
1641	Unsel-Annaw association-----	9,990	0.4
1643	Unsel-Annaw-Izo association-----	15,105	0.7
1670	Bouncer gravelly loamy fine sand, 15 to 50 percent slopes-----	2,330	0.1
1680	Lazan-Lazan, very steep-Nupart association-----	7,199	0.3
1691	Crunkvar-Lazan association-----	1,425	0.1
1700	Granmount-Klote-Hiridge association-----	165	*
1710	Troutville Variant very bouldery sandy loam, 30 to 75 percent slopes-----	600	*
1730	Bijorja-Petspring association-----	2,255	0.1
1750	Wedlar-Tert association-----	1,050	*

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
1753	Wedlar sand, 2 to 8 percent slopes-----	1,858	0.1
1780	Borealis-Rock outcrop association-----	5,470	0.2
1781	Borealis-Antholop-Rock outcrop association-----	13,878	0.6
1782	Borealis-Mopana association-----	3,512	0.2
1783	Borealis-Itca association-----	27,089	1.2
1790	Antholop-Wedlar association-----	2,102	0.1
1820	Lomoin-Petspring-Uripnes association-----	2,460	0.1
1821	Lomoin-Kyler-Budihol association-----	14,405	0.6
1822	Lomoin-Kyler-Petspring association-----	4,160	0.2
1825	Lomoin-Beelem-Rock outcrop association-----	6,625	0.3
1840	Kyler-Gabbvally association-----	3,990	0.2
1842	Kyler-Rock outcrop association-----	5,510	0.2
1843	Kyler-Logring-Rock outcrop association-----	2,665	0.1
1844	Kyler very gravelly fine sandy loam, 15 to 50 percent slopes-----	9,760	0.4
1860	Venable Family, 0 to 8 percent slopes-----	265	*
1870	Luning-Sundown association-----	12,340	0.5
1871	Luning sandy loam, 0 to 4 percent slopes-----	5,980	0.3
1875	Luning-Hawsley-Bluewing association-----	4,895	0.2
1877	Luning-Izo association-----	7,720	0.3
1878	Luning-Oricto association-----	3,635	0.2
1879	Luning-Eastgate association-----	6,295	0.3
1890	Wardenot, moderately steep-Wardenot-Izo association-----	3,510	0.2
1891	Wardenot-Izo association-----	7,810	0.3
1892	Wardenot, moist-Izo association-----	17,270	0.8
1893	Wardenot-Annaw-Izo association-----	4,325	0.2
1894	Wardenot-Truhoy-Izo association-----	16,640	0.7
1897	Wardenot-Stumble-Izo association-----	1,871	0.1
1910	Izo, rarely flooded-Izo association-----	11,125	0.5
1930	Cirac fine sandy loam, 0 to 2 percent slopes-----	3,465	0.2
1931	Cirac fine sandy loam, ponded, 0 to 2 percent slopes-----	1,010	*
1940	Typic Torriorthents, 15 to 75 percent slopes-----	1,795	0.1
1950	Lathrop-Terlco-Izo association-----	890	*
1951	Lathrop-Beltd-Veet association-----	485	*
1970	Pintwater-Blacktop-Rock outcrop association-----	109,460	4.8
1972	Pintwater-Terlco association-----	2,805	0.1
1980	Tert-Whilphang-Armespan association-----	2,180	0.1
1981	Tert-Whilphang-Geer association-----	5,165	0.2
1982	Tert-Badland association-----	3,515	0.2
1983	Tert-Roic association-----	1,010	*
1990	Whilphang-Armespan association-----	3,110	0.1
2002	Sodaspring-Izo association-----	12,290	0.5
2011	Nuahs loamy sand, 0 to 4 percent slopes-----	2,345	0.1
2020	Armespan-Whilphang-Wrango association-----	14,915	0.7
2022	Armespan-Whilphang-Geer association-----	1,010	*
2023	Armespan-Wrango association-----	2,455	0.1
2030	Theriot-Theriot, very steep-Rock outcrop association-----	13,530	0.6
2031	Theriot-Eaglepass-Rock outcrop association-----	2,355	0.1
2032	Theriot-Kyler-Rock outcrop association-----	4,160	0.2
2080	Roic-Roic, dry, association-----	1,600	0.1
2081	Roic-Roic, dry-Badland association-----	8,850	0.4
2082	Roic-Koyen association-----	6,080	0.3
2091	Geer-Veet association-----	1,340	0.1
2092	Geer fine sandy loam, 0 to 4 percent slopes-----	905	*
2100	Rodad-Theriot-Kyler association-----	1,660	0.1
2101	Rodad-Penelas-Blacktop association-----	4,260	0.2
2110	Bylo Variant very fine sandy loam, 0 to 2 percent slopes-----	285	*
2120	Itme-Truhoy association-----	2,730	0.1
3000	Perazzo-Typic Torriorthents association-----	870	*
3001	Perazzo-Rawe-Bluewing association-----	2,150	0.1
3002	Perazzo-Veet-Rawe association-----	1,060	*
3003	Perazzo-Bluewing association-----	1,555	0.1
3020	Rawe-Bluewing-Trocken association-----	3,380	0.1
3040	Deefan-Rawe-Bluewing association-----	6,755	0.3

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
3042	Deefan-Perazzo association-----	1,235	0.1
3043	Deefan-Cleaver-Bluewing association-----	3,645	0.2
3052	Veet-Itme association-----	1,895	0.1
3054	Veet gravelly sandy loam, 4 to 8 percent slopes-----	1,010	*
3060	Smedley-Silverbow-Annaw association-----	1,495	0.1
3061	Smedley-Annaw-Izo association-----	3,675	0.2
3063	Smedley very gravelly sandy loam, 4 to 30 percent slopes-----	6,895	0.3
3070	Silverbow-Rubble land-Smedley association-----	4,990	0.2
3090	Inmo-Inmo, occasionally flooded, association-----	11,290	0.5
3091	Inmo-Rednik association-----	1,755	0.1
3092	Inmo-Nuahs-Luning association-----	3,840	0.2
3095	Inmo-Stumble association-----	1,485	0.1
3110	Fulstone-Wedlar-Veet association-----	7,909	0.3
3111	Fulstone-Mickey association-----	2,305	0.1
3120	Wassit-Brawley association-----	17,840	0.8
3123	Wassit very stony sandy loam, 15 to 50 percent slopes-----	16,024	0.7
3124	Wassit-Loomer association-----	9,775	0.4
3130	Mickey-Smedley-Veet association-----	3,500	0.2
3131	Mickey-Veet association-----	10,502	0.5
3133	Mickey very gravelly sandy loam, 4 to 30 percent slopes-----	4,210	0.2
3140	Loomer-Rowel-Downeyville association-----	6,530	0.3
3141	Loomer-Rowel-Wassit association-----	13,060	0.6
3142	Loomer-Downeyville-Rock outcrop association-----	1,595	0.1
3143	Loomer-Rowel-Rubble land association-----	2,240	0.1
3150	Zyzzi very gravelly sandy loam , 8 to 30 percent slopes-----	2,380	0.1
3151	Zyzzi-Nupart association-----	3,870	0.2
3170	Ravenell-Haar-Rock outcrop association-----	2,510	0.1
3191	Wellsted-Mickey-Veet association-----	6,784	0.3
3192	Wellsted-Ravenell-Haar association-----	2,275	0.1
3193	Wellsted-Wedlar association-----	6,870	0.3
3194	Wellsted-Smedley-Mickey association-----	3,635	0.2
3210	Fallon-Fettic Variant-Fallon, saline-sodic, association-----	1,845	0.1
3212	Fallon-Slaw complex-----	2,290	0.1
3220	Rowel very cobbly sandy loam, 8 to 30 percent slopes-----	650	*
3221	Rowel-Rock outcrop association-----	415	*
3300	Typic Torriorthents, 4 to 15 percent slopes-----	19,855	0.9
3310	Veta-Smedley association-----	510	*
4000	Garhill-Blacktop association-----	48,156	2.1
4021	Argalt-Gabbvally association-----	6,115	0.3
4030	Koyen-Geer association-----	1,550	0.1
4050	Haarvar-Wrango association-----	1,070	*
4061	Truhoy-Wardenot association-----	6,462	0.3
4062	Truhoy gravelly loamy sand, 2 to 8 percent slopes-----	1,200	0.1
4070	Zadvar-Stewval association-----	2,910	0.1
4071	Zadvar-Wrango association-----	5,855	0.3
4073	Zadvar-Veet association-----	1,450	0.1
4080	Truvar-Crunker association-----	2,686	0.1
4081	Truvar-Fadoll association-----	1,320	0.1
4090	Eaglepass-Rock outcrop complex, 30 to 75 percent slopes-----	1,170	0.1
4100	Stumble loamy sand, 2 to 4 percent slopes-----	49,074	2.1
4102	Stumble loamy fine sand, 4 to 15 percent slopes-----	8,990	0.4
4103	Stumble-Stumble, sodic loamy fine sands, 0 to 8 percent slopes-----	2,290	0.1
4110	Fadoll loamy sand, 0 to 4 percent slopes-----	6,745	0.3
4121	Brawley very stony fine sandy loam, 15 to 50 percent slopes-----	3,530	0.2
4130	Penelas-Rodad-Gabbvally association-----	2,435	0.1
4150	Stewval-Lomoine association-----	13,840	0.6
4152	Stewval-Pintwater-Rock outcrop association-----	9,795	0.4
4153	Stewval very gravelly sandy loam, 8 to 50 percent slopes-----	36,946	1.6
4154	Stewval, very steep-Stewval-Gabbvally association-----	31,660	1.4
4155	Stewval-Kyler association-----	11,010	0.5
4156	Stewval-Beelem association-----	6,110	0.3
4157	Stewval-Bellehelen-Rock outcrop association-----	7,590	0.3
4159	Stewval-Gabbvally-Tejabe association-----	8,745	0.4

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
4161	Terlco-Izo association-----	3,080	0.1
4162	Terlco-Annaw-Izo association-----	10,425	0.5
4163	Terlco-Izo association, moderately steep-----	4,585	0.2
4165	Terlco-Wardenot-Roic association-----	5,250	0.2
4166	Terlco, dry-Wardenot-Roic association-----	4,545	0.2
4170	Downeyville-Blacktop association-----	24,117	1.1
4171	Downeyville-Hawsley association-----	1,010	*
4173	Downeyville-Stewval-Rock outcrop association-----	4,940	0.2
4174	Downeyville-Stewval-Mirkwood association-----	3,230	0.1
4175	Downeyville, moist-Downeyville-Blacktop association-----	24,090	1.1
4176	Downeyville, moist-Downeyville-Gabbvally association-----	28,230	1.2
4177	Downeyville-Mirkwood-Nemico association-----	1,750	0.1
4178	Downeyville-Stewval-Blacktop association-----	5,440	0.2
4180	Candelaria-Izo association-----	10,265	0.4
4181	Candelaria-Wardenot-Izo association-----	31,461	1.4
4182	Candelaria-Gynelle-Izo association-----	9,320	0.4
4183	Candelaria-Izo, rarely flooded, association-----	2,330	0.1
4184	Candelaria, dry-Izo association-----	3,665	0.2
4185	Candelaria-Typic Torriorthents association-----	2,575	0.1
4186	Candelaria-Roic-Izo association-----	2,570	0.1
4188	Candelaria-Downeyville-Annaw association-----	1,830	0.1
4189	Candelaria-Typic Torriorthents, very steep, association-----	1,770	0.1
4190	Brier-Beelem-Wassit association-----	2,075	0.1
4191	Brier-Brawley-Rock outcrop association-----	1,846	0.1
4192	Brier-Katyblay-Hiridge association-----	1,264	0.1
4200	Sonoma silt loam-----	1,915	0.1
4210	Sagouspe sand, frequently flooded, 0 to 2 percent slopes-----	1,755	0.1
4211	Sagouspe sand, drained, 0 to 2 percent slopes-----	1,025	*
4212	Sagouspe sand, dry, 0 to 4 percent slopes-----	1,245	0.1
4220	Patna-Hawsley sands, 0 to 4 percent slopes-----	8,990	0.4
4221	Patna sand, 0 to 2 percent slopes-----	2,090	0.1
4230	Typic Torriorthents-Patna-Badland association-----	1,065	*
4240	Typic Torriorthents, 2 to 4 percent slopes-----	1,285	0.1
4250	Bango-Hawsley complex, 0 to 4 percent slopes-----	3,715	0.2
5010	Mopana-Nire association-----	2,814	0.1
5011	Mopana-Holtle Variant association-----	2,173	0.1
5050	Nire-Epvip-Hiridge association-----	4,615	0.2
5051	Nire stony fine sandy loam, 4 to 15 percent slopes-----	4,605	0.2
5052	Nire-Hiridge association-----	3,037	0.1
5080	Epvip-Hiridge-Katyblay association-----	3,520	0.2
5100	Oricto-Gynelle-Izo association-----	64,986	2.8
5101	Oricto-Izo association-----	13,345	0.6
5103	Oricto, dry-Sundown-Oricto association-----	1,575	0.1
5105	Oricto-Luning association-----	9,135	0.4
5106	Oricto-Barnmot-Gynelle association-----	1,105	*
5107	Oricto-Terlco-Roic association-----	760	*
5110	Cucamungo Variant gravelly sandy loam, 4 to 15 percent slopes-----	1,230	0.1
6000	Hiridge-Katyblay-Granmount association-----	1,174	0.1
6001	Hiridge very gravelly sandy loam, 8 to 30 percent slopes-----	1,400	0.1
6010	Typic cryorthents, 15 to 50 percent slopes-----	860	*
6020	Celeton-Dumps-Izo association-----	165	*
6060	Wiskiflat gravelly loamy sand, 2 to 15 percent slopes-----	4,310	0.2
6070	Breko-Crunker association-----	8,050	0.4
6071	Breko stony loamy sand, 4 to 15 percent slopes-----	1,100	*
6072	Breko-Wiskiflat association-----	5,345	0.2
6073	Breko gravelly sandy loam, 2 to 8 percent slopes-----	2,135	0.1
6081	Handpah-Breko-Crunker association-----	3,605	0.2
6082	Handpah-Breko association-----	2,340	0.1
6092	Beelem-Wassit association-----	2,678	0.1
6093	Beelem-Stewval-Rock outcrop association-----	2,315	0.1
6094	Beelem-Bellehelen-Stewval association-----	4,505	0.2
7000	Logring-Kyler association, steep-----	7,255	0.3
7001	Logring-Kyler association-----	1,450	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
7002	Logring-Eaglepass-Kyler complex, 15 to 75 percent slopes-----	1,630	0.1
7010	Armoine-Beelem association-----	2,600	0.1
7012	Armoine-Petspring association-----	5,630	0.2
7020	Squawtip-Brier-Rock outcrop association-----	2,590	0.1
7021	Squawtip-Gabbvally-Rock outcrop association-----	850	*
8030	Ravenswood-Brier-Itca association-----	1,505	0.1
8040	Jetcop-Gabbvally association-----	24,830	1.1
8050	Itca-Teguro-Rock outcrop association-----	1,010	*
	Water-----	30,480	1.3
	Total-----	2,285,841	100.0

\* Less than 0.1 percent.

TABLE 5.--ENGINEERING INDEX PROPERTIES

(The symbol &lt; means less than; &gt; means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number-				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
202----- Tornillo Variant	0-4	Fine sandy loam	SM, ML	A-2, A-4	0	100	100	70-90	30-65	20-25	NP-5
	4-12	Clay loam-----	CL	A-6, A-7	0	100	100	60-90	55-80	35-45	15-25
	12-60	Stratified sandy clay loam to silty clay.	CL	A-6, A-7	0	100	100	75-100	55-80	35-50	15-25
203----- Toney Family	0-6	Gravelly sandy loam.	SM	A-1, A-2	0	80-95	50-75	35-45	20-30	20-25	NP-5
	6-15	Gravelly clay----	SC	A-7	0	80-90	60-75	50-60	40-50	45-50	25-30
	15-24	Gravelly clay loam.	SC, GC	A-7	0	70-85	60-70	50-65	40-50	40-45	20-25
	24-56	Very gravelly sandy loam, gravelly sandy loam.	GM	A-1, A-2	0	40-65	30-60	20-50	15-30	20-25	NP-5
205----- Pedee Variant	0-3	Sand-----	SM	A-1, A-2	0	100	90-100	40-60	20-30	---	NP
	3-9	Sandy clay loam	SC	A-6	0	100	90-100	50-60	35-45	25-35	10-15
	9-16	Gravelly clay----	GC, SC	A-7	0	70-80	60-70	50-60	45-50	40-55	25-35
	16-29	Very gravelly clay.	GC	A-2	0	30-50	25-40	20-35	15-30	45-55	25-35
	29-44	Extremely gravelly sandy clay loam.	GC, GP-GC	A-2	0	15-30	10-25	5-20	5-15	35-45	20-25
206*: Bombadil Family-	0-2	Very gravelly sand.	GP-GM, GP, SP-SM, SP	A-1	0	50-60	40-50	30-35	0-10	---	NP
	2-6	Gravelly sandy loam.	SM	A-1, A-2, A-4	0	70-80	60-75	40-60	20-40	20-30	NP-5
	6-9	Loam, clay loam	CL, CL-ML	A-4, A-6	0	95-100	75-90	60-80	50-65	25-35	5-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Acana Family----	0-2	Very gravelly loamy sand.	GM	A-1	0	45-55	35-50	20-35	10-20	---	NP
	2-6	Sandy loam-----	SM	A-4	0	85-95	80-90	50-65	35-50	20-25	NP-5
	6-10	Gravelly clay loam.	GC, CL	A-6, A-7	0	70-80	65-75	60-70	35-55	35-45	15-20
	10-16	Cemented-----	---	---	---	---	---	---	---	---	---
	16	Indurated-----	---	---	---	---	---	---	---	---	---
207----- Bulake Family	0-4	Gravelly loamy sand.	SM	A-1	0	65-85	50-75	25-45	15-25	---	NP
	4-17	Clay-----	CH, CL	A-7	0	85-100	75-90	70-85	60-80	45-55	20-30
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
208----- Bregar Family	0-2	Very gravelly sand.	SP-SM, SP	A-1	10-15	50-60	45-55	25-35	0-10	---	NP
	2-5	Sandy loam-----	SM	A-4	0	100	80-95	50-75	35-50	15-25	NP-5
	5-8	Very gravelly loam, very gravelly clay loam.	GC	A-2	0	30-65	25-50	20-40	15-35	25-35	10-20
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
211*: Langston Family-	0-4	Loamy sand-----	SM	A-2, A-4	0	100	100	50-80	25-40	---	NP
	4-9	Sandy loam-----	SM, SM-SC	A-4	0	100	100	70-80	40-50	20-30	NP-10
	9-14	Sandy clay loam	CL	A-6	0	100	100	70-90	50-60	30-40	10-20
	14-40	Very gravelly sand.	GP-GM, SP-SM	A-1	0	50-60	30-50	20-35	5-10	---	NP
	40-50	Loamy sand-----	SM	A-1, A-2, A-4	0	80-100	75-100	40-80	15-40	---	NP
Karpp Family----	0-2	Very gravelly sandy loam.	GM	A-1	0	30-55	25-50	15-40	10-25	15-25	NP-5
	2-9	Extremely gravelly sandy loam.	GP, GP-GM, GM	A-1	0	15-30	10-25	5-20	0-15	15-25	NP-5
	9	Indurated-----	---	---	---	---	---	---	---	---	---
213*: Ratto Family----	0-3	Gravelly sand----	SP-SM, SM	A-1	0-10	60-80	50-75	25-35	5-15	---	NP
	3-18	Clay-----	CL, CH	A-7	0	85-100	80-100	70-80	65-75	45-55	20-30
	18	Indurated-----	---	---	---	---	---	---	---	---	---
Vinini Family----	0-1	Very gravelly sand.	GP-GM, SP-SM	A-1	0-5	50-60	35-45	15-30	5-10	---	NP
	1-3	Clay loam-----	CL	A-6, A-7	0	90-100	80-100	50-75	40-55	35-45	15-20
	3-15	Very gravelly clay loam.	GC	A-2, A-6, A-7	0	30-55	25-50	20-45	20-40	35-45	15-20
	15-19	Very gravelly sandy loam.	GM	A-1	0	30-60	25-50	20-40	10-25	20-25	NP-5
	19	Indurated-----	---	---	---	---	---	---	---	---	---
214----- Watoopah Family	0-2	Loamy sand-----	SM	A-2	0	100	90-100	70-80	15-20	---	NP
	2-8	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	100	95-100	70-90	35-60	20-30	NP-10
	8-13	Cobbly sandy loam	SM, SM-SC	A-2	25-45	90-100	85-95	50-60	20-35	20-30	NP-10
	13-20	Gravelly sandy clay loam.	SC, CL	A-6, A-7	0	70-85	55-70	45-60	40-55	30-45	10-20
	20-44	Stratified gravelly loamy sand to very gravelly sand.	GP-GM, GM, SP-SM, SM	A-1	0	50-60	40-50	25-35	5-15	---	NP
	44	Indurated-----	---	---	---	---	---	---	---	---	---
216----- Merino Family	0-2	Extremely gravelly coarse sand.	GP	A-1	0	35-50	15-25	10-20	0-5	---	NP
	2-5	Sandy loam-----	SM-SC	A-2, A-4	0	90-95	80-90	45-65	30-45	25-30	5-10
	5-12	Extremely gravelly sandy loam.	GP-GC	A-2	0	35-60	5-10	5-10	0-5	25-30	5-10
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
218*: Ratto Family----	0-3	Gravelly sand----	SP-SM, SM	A-1	0-10	60-80	50-75	25-35	5-15	---	NP
	3-18	Clay-----	CL, CH	A-7	0	85-100	80-100	70-80	65-75	45-55	20-30
	18	Indurated-----	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
218*: Borealis Family-	0-2	Very cobbly sandy loam.	SM	A-4	45-60	90-95	85-95	50-70	35-50	20-25	NP-5
	2-8	Gravelly sandy loam.	SM	A-1, A-2, A-4	0	70-80	50-70	40-60	20-40	20-25	NP-5
	8-20	Clay-----	CH, CL	A-7	0	85-90	80-90	70-80	60-80	45-60	20-30
	20-24	Indurated-----	---	---	---	---	---	---	---	---	---
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
301*: Lazan Family----	0-2	Gravelly sand----	SM	A-1, A-2	10	70-80	50-70	35-50	15-30	---	NP
	2-4	Very gravelly sand.	SP, SP-SM	A-1	0	60-70	25-50	15-25	0-10	---	NP
	4-23	Weathered bedrock	---	---	0	---	---	---	---	---	---
	23-30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Powment-----	0-2	Very gravelly sand.	SP-SM	A-1	0	75-90	25-50	15-30	5-10	---	NP
	2-10	Extremely gravelly sand, very gravelly sand.	SP	A-1	0	70-80	10-35	5-20	0-5	---	NP
	10	Weathered bedrock	---	---	---	---	---	---	---	---	---
302----- Jeness Family	0-37	Sandy loam-----	SM	A-4	0	80-100	75-100	50-75	35-50	15-25	NP-5
	37-60	Loamy very fine sand.	SM	A-4	0	80-100	75-100	60-100	35-50	---	NP
304*: Reese Family----	0-9	Loamy sand-----	SM	A-2, A-4	0	100	95-100	40-65	30-40	---	NP
	9-60	Stratified loamy sand to silty clay loam.	CL-ML, ML	A-4, A-6	0	100	90-100	85-95	70-80	25-40	5-15
Tornillo Variant	0-17	Silty clay loam	ML	A-6, A-7	0	100	100	85-95	80-90	35-45	10-15
	17-22	Very fine sandy loam.	SM-SC	A-4	0	100	100	85-95	40-50	20-30	5-10
	22-32	Silty clay loam	ML	A-6, A-7	0	100	100	85-95	80-85	35-45	10-15
	32-60	Stratified very fine sandy loam to sand.	SM-SC, SM	A-4, A-2	0	100	100	75-90	25-50	20-30	NP-10
Kawich Family----	0-3	Fine sand-----	SM	A-2, A-4	0	100	100	80-90	30-40	---	NP
	3-60	Fine sand-----	SM	A-2, A-4	0	100	100	80-90	30-40	---	NP
305----- Sheeprock Family	0-6	Gravelly sandy loam.	SM, SM-SC	A-2, A-4	0	70-80	55-65	35-55	25-40	20-30	NP-10
	6-55	Very gravelly loamy sand.	GM, GP-GM	A-1	0	40-55	35-50	25-40	5-15	---	NP
306----- Baldy Variant	0-24	Silt loam-----	ML, CL-ML	A-4	0	100	100	70-80	50-70	25-35	5-10
	24-32	Silty clay loam	CL, ML	A-7	0	100	90-100	80-90	70-80	40-50	15-20
	32-44	Very fine sandy loam.	CL-ML, SM-SC	A-4	0	100	90-100	70-90	40-60	25-30	5-10
	44-56	Very gravelly sand.	GM	A-1	0	40-60	25-40	20-35	10-20	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number-				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
307*: Jenness Family--	0-37	Sandy loam-----	SM	A-4	0	80-100	75-100	50-75	35-50	15-25	NP-5
	37-60	Loamy very fine sand.	SM	A-4	0	80-100	75-100	60-100	35-50	---	NP
Fadoll-----	0-10	Gravelly loamy sand.	SM, GM	A-1	0	55-80	50-75	35-50	15-20	---	NP
	10-35	Loamy sand, sand	SM	A-2	0	85-100	75-100	55-65	20-30	---	NP
	35-60	Very gravelly sand.	SP-SM, GP-GM	A-1	0	45-60	35-50	20-30	5-10	---	NP
502----- Hapgood Family	0-5	Very cobbly sandy loam.	SM, SM-SC	A-2, A-4	50-65	75-90	70-85	50-65	25-40	20-30	NP-10
	5-40	Very cobbly sandy loam.	SM, SM-SC	A-2, A-4	50-65	75-90	70-85	50-65	25-40	20-30	NP-10
504----- Coutis Family	0-29	Sandy loam-----	SM	A-4	0	95-100	85-95	60-70	40-50	15-25	NP-5
	29-43	Very gravelly sandy loam.	GM, SM	A-1, A-2	0	40-70	30-50	20-45	10-30	15-25	NP-5
	43-53	Weathered bedrock	---	---	---	---	---	---	---	---	---
505*: Madeline Family-	0-2	Gravelly sandy loam.	SM	A-2, A-4	0-5	75-85	60-75	50-65	25-45	20-25	NP-5
	2-5	Clay loam-----	CL	A-6, A-7	0-5	85-95	80-90	75-85	65-80	35-45	15-20
	5-10	Clay-----	CH	A-7	0-5	85-95	80-90	75-85	65-80	50-65	25-35
	10-16	Weathered bedrock	---	---	---	---	---	---	---	---	---
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Bulake Family---	0-4	Cobbly very fine sandy loam.	SM	A-4	25-35	80-90	70-80	65-75	35-45	20-25	NP-5
	4-17	Clay-----	CH, CL	A-7	0	95-100	90-95	70-85	55-70	40-55	15-30
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
507----- Clanalpine Family	0-3	Very cobbly very fine sandy loam.	SM	A-4	50-60	80-90	75-85	70-80	35-45	20-25	NP-5
	3-8	Cobbly loam-----	CL-ML, CL	A-4, A-6	15-30	90-100	85-95	60-90	50-60	25-35	5-15
	8-15	Very cobbly clay loam.	CL	A-6	50-60	80-90	75-85	70-80	60-70	30-40	15-20
	15-40	Extremely cobbly loam.	GM-GC, GC	A-2	70-80	40-55	30-45	25-40	15-30	25-35	5-15
902*: Lava flows.  Lithic Xerorthents----	0-2	Very cobbly fine sand.	SM	A-2	50-60	80-90	75-80	60-75	20-30	---	NP
	2-9	Very cobbly fine sand, extremely cobbly fine sand.	SM	A-2	60-80	80-90	75-80	60-75	20-30	---	NP
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1032*: Goldyke-----	0-3	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-85	55-70	30-50	15-30	20-25	NP-5
	3-6	Gravelly sandy loam, gravelly fine sandy loam.	SM-SC, SM	A-2, A-1	0	60-80	50-75	40-65	10-35	20-30	NP-10
	6-22	Weathered bedrock	---	---	---	---	---	---	---	---	---
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Trocken-----	0-3	Gravelly loamy sand.	SM	A-1	0-10	65-85	50-75	30-50	10-20	---	NP
	3-60	Stratified gravelly loam to extremely gravelly loamy coarse sand.	GM, SM	A-1	0-15	35-70	20-50	15-40	10-20	20-25	NP-5
1033*: Goldyke-----	0-3	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-85	55-70	30-50	15-30	20-25	NP-5
	3-9	Gravelly sandy loam, gravelly fine sandy loam.	SM-SC, SM	A-2, A-1	0	60-80	50-75	40-65	10-35	20-30	NP-10
	9-27	Weathered bedrock	---	---	---	---	---	---	---	---	---
	27-31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Koyen-----	0-2	Fine sandy loam	SM	A-4	0	90-100	85-100	75-90	35-50	15-25	NP-5
	2-18	Sandy loam-----	SM	A-4	0	90-95	85-95	50-75	35-50	15-25	NP-5
	18-40	Stratified loam to gravelly loamy sand.	SM	A-2, A-4	0	80-90	75-85	50-60	25-40	15-25	NP-5
	40-60	Gravelly loamy sand, very gravelly loamy sand.	GP-GM, GM, SP-SM, SM	A-1	0	50-60	45-55	25-35	5-15	---	NP
1040*: Isolde-----	0-6	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	6-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
Hawsley-----	0-3	Loamy sand-----	SM	A-2	0	100	90-100	60-75	20-35	---	NP
	3-60	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
1041*: Isolde-----	0-6	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	6-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
Playas.											
Wabuska-----	0-9	Loamy sand-----	SM	A-2	0	100	95-100	55-70	15-30	---	NP
	9-60	Stratified sand to silt loam.	SM, SM-SC, CL-ML, ML	A-4	0	100	95-100	60-75	40-60	20-30	NP-10

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
1042*: Isolde-----	0-6	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	6-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
Dune land.											
1043*: Isolde-----	0-6	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	6-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
Cirac-----	0-5	Sandy clay loam	CL	A-6	0	100	75-100	60-75	50-60	30-40	10-20
	5-60	Stratified gravelly sand to silt loam.	SM	A-4	0	100	75-100	50-70	35-50	15-25	NP-5
Playas.											
1044*: Isolde-----	0-6	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	6-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
Patna-----	0-6	Loamy sand-----	SM	A-2	0	95-100	95-100	60-70	15-25	---	NP
	6-24	Sandy loam, fine sandy loam, coarse sandy loam.	SM-SC	A-4	0	95-100	95-100	65-80	35-50	25-30	5-10
	24-43	Sand, loamy sand	SP-SM, SM	A-2, A-3	0	95-100	95-100	50-60	5-20	---	NP
	43-60	Fine sand, loamy fine sand, loamy sand.	SM	A-2	0	95-100	95-100	60-80	15-35	---	NP
Hawsley-----	0-8	Sand-----	SM, SP-SM	A-2, A-3	0	100	90-100	75-90	5-20	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
1072*: Rednik-----	0-6	Very gravelly sandy loam.	GM	A-1	0-5	45-55	35-50	25-40	15-25	---	NP
	6-11	Very gravelly sandy loam, extremely gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	35-60	30-50	20-35	15-30	25-35	10-15
	11-16	Very gravelly sandy loam, very gravelly fine sandy loam.	GM	A-1	5-30	35-60	30-50	15-40	10-25	---	NP
	16-60	Very gravelly sand, extremely gravelly loamy sand.	GP, GP-GM, SP-SM, GM	A-1	5-30	30-60	25-60	15-30	0-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
1072*: Troocken-----	0-3	Gravelly fine sandy loam.	SM	A-1, A-2	0-10	65-85	50-75	40-60	20-30	20-25	NP-5
	3-60	Stratified gravelly loam to extremely gravelly loamy coarse sand.	GM, SM	A-1	0-15	35-70	20-50	15-40	10-20	20-25	NP-5
Bluewing-----	0-7	Very gravelly loamy sand.	GP-GM	A-1	5-15	30-40	25-35	15-25	5-10	---	NP
	7-60	Stratified very gravelly coarse sand to extremely gravelly loamy sand.	GP-GM	A-1	15-25	30-40	25-35	15-25	5-10	---	NP
1090*: Singatse-----	0-3	Very gravelly sandy loam.	SM	A-1	0-10	70-80	45-55	30-40	15-25	15-25	NP-5
	3-9	Very gravelly sandy loam, very gravelly loam.	SM	A-1, A-2	0-10	60-70	30-50	20-30	10-30	15-25	NP-5
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Theon-----	0-1	Very stony fine sandy loam.	GM-GC, SM-SC	A-2, A-4	15-55	55-80	45-75	35-50	20-45	20-30	5-10
	1-8	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	5-25	40-60	25-50	15-40	10-30	30-40	10-20
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1091*: Singatse-----	0-2	Very gravelly sandy loam.	SM	A-1	0-10	70-80	45-55	30-40	15-25	15-25	NP-5
	2-6	Very gravelly sandy loam, very gravelly loam.	SM	A-1, A-2	0-10	60-70	30-50	20-30	10-30	15-25	NP-5
	6	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gynelle-----	0-2	Very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-60	30-50	15-35	5-15	---	NP
	2-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	35-60	20-40	10-20	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number-				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1091*: Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1094*: Singatse-----	0-3	Very stony sandy loam.	GM	A-1	25-45	40-60	35-55	20-35	10-20	15-25	NP-5
	3-9	Very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	0-10	35-55	30-50	20-45	10-35	15-25	NP-5
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hawsley-----	0-8	Loamy sand-----	SM	A-2	0	100	90-100	60-75	20-35	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
1121*: Theon-----	0-3	Very gravelly sandy loam.	GM-GC, GM	A-2, A-1	5-10	40-60	30-50	20-45	15-35	20-30	NP-10
	3-12	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	5-15	40-60	30-50	25-40	15-30	30-40	10-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Old Camp-----	0-2	Very stony loam	GM, GM-GC, SM, SM-SC	A-2, A-4	25-55	60-70	55-65	45-55	30-40	15-25	NP-10
	2-14	Very cobbly clay loam, extremely stony sandy clay loam, very stony clay loam.	GC	A-2, A-6	35-50	40-55	35-50	30-45	25-40	30-40	15-25
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1127----- Theon	0-2	Very gravelly sandy loam.	GM-GC, GM	A-2, A-1	5-10	40-60	30-50	20-45	15-35	20-30	NP-10
	2-11	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	5-15	40-60	30-50	25-40	15-30	30-40	10-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
1130*: Uripnes-----	0-3	Very stony sandy loam.	SM	A-1	20-35	75-90	30-50	25-35	10-25	20-25	NP-5
	3-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1131*: Uripnes-----	0-4	Extremely bouldery sandy loam.	SM	A-1	45-60	70-85	30-45	15-30	10-20	20-25	NP-5
	4-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Budihol-----	0-2	Extremely bouldery sandy loam.	SM	A-1, A-2	20-50	75-95	65-85	45-60	20-35	20-25	NP-5
	2-10	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	20-25	NP-5
	10-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1136*: Uripnes-----	0-3	Extremely bouldery sandy loam.	SM	A-1	45-60	70-85	30-45	15-30	10-20	20-25	NP-5
	3-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Pumel-----	0-1	Very gravelly sandy loam.	SP-SM, GP-GM, SM, GM	A-1	10-25	40-70	35-50	25-35	10-15	20-25	NP-5
	1-4	Very gravelly coarse sandy loam, extremely gravelly sandy loam.	SM, GM	A-1	10-25	40-70	25-50	10-35	10-15	20-25	NP-5
	4-8	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1138*: Uripnes-----	0-3	Extremely bouldery sandy loam.	SM	A-1	45-60	70-85	30-45	15-30	10-20	20-25	NP-5
	3-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1138*: Petspring-----	0-1	Very bouldery coarse sandy loam.	SP-SM, SM	A-1	15-30	80-90	25-50	15-30	5-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1139*: Uripnes-----	0-3	Very stony sandy loam.	SM	A-1	20-35	75-90	30-50	25-35	10-25	20-25	NP-5
	3-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Zyzzi-----	0-2	Very gravelly sandy loam.	SM	A-1	0-5	75-90	35-50	20-35	10-20	---	NP
	2-6	Extremely gravelly sandy clay loam, very gravelly sandy clay loam.	SC	A-2	0-5	60-75	20-35	15-30	10-20	35-40	15-20
	6-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1140*: Wabuska-----	0-14	Loam-----	CL-ML	A-4	0	100	100	85-100	65-85	25-30	5-10
	14-60	Stratified sand to silt loam.	SM, SM-SC, CL-ML, ML	A-4	0	100	95-100	60-75	40-60	20-30	NP-10
Isolde-----	0-4	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	4-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
1141*: Wabuska-----	0-9	Loam-----	CL-ML	A-4	0	100	100	85-100	65-85	25-30	5-10
	9-60	Stratified sand to silt loam.	SM, SM-SC, CL-ML, ML	A-4	0	100	90-100	60-75	40-60	20-30	NP-10
Playas.											
Isolde-----	0-6	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	6-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
1142*: Wabuska-----	0-9	Loam-----	CL-ML	A-4	0	100	100	85-100	65-85	25-30	5-10
	9-60	Stratified sand to silt loam.	SM, SM-SC, CL-ML, ML	A-4	0	100	90-100	60-75	40-60	20-30	NP-10
Playas.											
1151----- Gynelle	0-2	Very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-60	30-50	15-35	5-15	---	NP
	2-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	35-60	20-40	10-20	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1153----- Gynelle	0-3	Gravelly loamy sand.	SM	A-2	0-5	65-85	55-75	40-50	25-35	---	NP
	3-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	40-60	20-40	10-20	---	NP
1155*: Gynelle-----	0-2	Very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-60	30-50	15-35	5-15	---	NP
	2-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	35-60	20-40	10-20	---	NP
Izo-----	0-3	Extremely gravelly loamy sand.	GP	A-1	0-15	20-40	10-25	0-10	0-5	---	NP
	3-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1156*: Gynelle-----	0-3	Loamy sand-----	SM	A-1, A-2	0	80-95	80-95	45-60	20-35	---	NP
	3-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-75	40-60	20-40	10-20	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1171*: Hawsley-----	0-8	Loamy sand-----	SM	A-2	0	100	90-100	60-75	20-35	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
Theon-----	0-2	Very gravelly sandy loam.	GM-GC, GM	A-2, A-1	5-10	40-60	30-50	20-45	15-35	20-30	NP-10
	2-11	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	5-15	40-60	30-50	25-40	15-30	30-40	10-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1172----- Hawsley	0-8	Sand-----	SM, SP-SM	A-2, A-3	0	100	90-100	75-90	5-20	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
1173*: Hawsley-----	0-8	Sand-----	SM, SP-SM	A-2, A-3	0	100	90-100	75-90	5-20	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1174*: Hawsley-----	0-8	Sand-----	SM, SP-SM	A-2, A-3	0	100	90-100	75-90	5-20	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
Typic Torriorthents--	0-6	Gravelly loamy sand.	SM	A-1, A-2	0	60-80	50-75	30-55	10-20	---	NP
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
1180*: Buckaroo-----	0-4	Stony fine sandy loam.	GM, SM	A-2, A-4	5-15	60-85	50-75	40-70	25-45	15-25	NP-5
	4-18	Clay, clay loam	CL, CH	A-7	0-5	90-100	85-100	75-90	65-80	40-55	15-30
	18-60	Very gravelly sandy loam.	GM	A-1	0-15	45-60	30-45	20-35	10-25	15-25	NP-5
Bluewing-----	0-7	Stony loamy sand	GP-GM	A-1	5-15	30-40	25-35	15-25	5-10	---	NP
	7-60	Stratified very gravelly coarse sand to extremely gravelly loamy sand.	GP-GM	A-1	15-25	30-40	25-35	15-25	5-10	---	NP
1190*: Old Camp-----	0-2	Extremely stony loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-55	60-70	55-65	45-55	30-40	15-25	NP-10
	2-14	Very cobbly clay loam, extremely stony sandy clay loam, very stony clay loam.	GC	A-2, A-6	35-50	40-55	35-50	30-45	25-40	30-40	15-25
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1190*: Theon-----	<u>In</u>										
	0-2	Very stony fine sandy loam.	GM-GC, SM-SC	A-2, A-4	15-55	55-80	45-75	35-50	20-45	20-30	5-10
	2-11	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	5-25	40-60	25-50	15-40	10-30	30-40	10-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1200*. Playas											
1201*: Playas.											
Slaw-----	0-9	Silt loam-----	CL-ML	A-4	0	95-100	95-100	85-100	75-90	25-30	5-10
	9-48	Stratified very fine sandy loam to silty clay.	ML, CL	A-6, A-7	0	100	100	95-100	85-95	35-45	10-20
	48-60	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-4, A-2, A-6	0	95-100	95-100	70-80	30-50	20-35	NP-15
1202*: Dumps.											
Pits.											
1205*. Badland											
1210*: Trocken-----	0-3	Gravelly loamy sand.	SM	A-1	0-10	65-85	50-75	30-50	10-20	---	NP
	3-60	Stratified gravelly loam to extremely gravelly loamy coarse sand.	GM, SM	A-1	0-15	35-70	20-50	15-40	10-20	20-25	NP-5
Bluewing-----	0-7	Very gravelly loamy sand.	SP-SM	A-1	10-25	70-85	35-45	15-30	5-10	---	NP
	7-60	Stratified very gravelly sand to extremely gravelly loamy coarse sand.	GP-GM, GP	A-1	0-25	40-50	20-35	10-15	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1221----- Eastgate	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-5	70-85	60-75	35-50	20-35	15-20	NP-5
	6-14	Gravelly sandy loam, sandy loam.	SM	A-1, A-2	0	75-95	70-90	40-55	20-30	15-20	NP-5
	14-31	Gravelly loamy sand, loamy sand.	SM	A-1	0	75-95	70-90	35-50	10-20	---	NP
	31-60	Very gravelly loamy sand.	GP-GM	A-1	0-10	40-55	35-50	15-35	5-10	---	NP
1223*: Eastgate-----	0-5	Gravelly loamy sand.	SM	A-1	0	60-75	55-70	30-50	10-20	---	NP
	5-17	Gravelly sandy loam, sandy loam.	SM	A-1, A-2	0	75-95	70-90	40-55	20-30	15-20	NP-5
	17-25	Gravelly loamy sand, loamy sand.	SM	A-1	0	75-95	70-90	35-50	10-20	---	NP
	25-60	Very gravelly loamy sand.	GP-GM	A-1	0-10	40-55	35-50	15-35	5-10	---	NP
Cirac-----	0-5	Fine sandy loam	SM	A-4	0	100	75-100	60-75	35-45	15-25	NP-5
	5-60	Stratified gravelly sand to silt loam.	SM	A-4	0	100	75-100	50-70	35-50	15-25	NP-5
1240*: Blacktop-----	0-4	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	4-8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Downeyville-----	0-5	Very gravelly sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	20-45	15-30	15-25	NP-10
	5-14	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1241*: Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1243*: Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1243*: Rodad-----	0-4	Very cobbly loam	GM, GM-GC, SM, SM-SC	A-1, A-2	25-40	45-70	40-65	30-50	20-35	20-30	NP-10
	4-12	Very channery clay loam, very gravelly clay loam.	GC	A-2, A-6, A-7	0-15	35-65	30-55	25-50	20-45	35-45	15-25
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
Theriot-----	0-3	Very gravelly sandy loam.	GM, SM	A-1, A-2	15-35	40-70	40-60	25-50	10-30	---	NP
	3-14	Very stony loam, very cobbly loam, very gravelly sandy loam.	GM, SM	A-1, A-2, A-4	20-55	40-75	35-75	25-60	15-50	20-25	NP-5
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1280*: Chill-----	0-4	Gravelly sandy loam.	SM	A-1, A-2	0	80-95	55-75	40-55	20-35	---	NP
	4-7	Gravelly sandy clay loam.	SC	A-2	0	90-100	50-75	40-60	25-35	35-45	15-20
	7	Weathered bedrock	---	---	---	---	---	---	---	---	---
Petspring-----	0-1	Very gravelly coarse sandy loam.	SM	A-1	0-20	80-90	30-50	15-30	10-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
1281*: Chill-----	0-3	Gravelly sandy loam.	SM	A-1, A-2	0	80-95	55-75	40-55	20-35	---	NP
	3-7	Gravelly sandy clay loam.	SC	A-2	0	90-100	50-75	40-60	25-35	35-45	15-20
	7	Weathered bedrock	---	---	---	---	---	---	---	---	---
Beelem-----	0-1	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1282*: Chill-----	0-3	Gravelly sandy loam.	SM	A-1, A-2	0	80-95	55-75	40-55	20-35	---	NP
	3-7	Gravelly sandy clay loam.	SC	A-2	0	90-100	50-75	40-60	25-35	35-45	15-20
	7	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1282*: Veet-----	0-5	Gravelly sandy loam.	SM	A-2	0-10	75-90	50-75	40-60	25-35	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP
1283*: Chill-----	0-3	Gravelly sandy loam.	SM	A-1, A-2	0	80-95	55-75	40-55	20-35	---	NP
	3-7	Gravelly sandy clay loam.	SC	A-2	0	90-100	50-75	40-60	25-35	35-45	15-20
	7	Weathered bedrock	---	---	---	---	---	---	---	---	---
Itme-----	0-6	Very gravelly sand.	SP-SM, SP	A-1	0-5	65-85	25-50	10-30	0-10	---	NP
	6-60	Very gravelly loamy sand, very gravelly sand.	SP-SM, SM, SP	A-1	0-25	65-85	25-50	10-30	0-15	---	NP
1290*: Petspring-----	0-1	Very gravelly coarse sandy loam.	SM	A-1	0-20	80-90	30-50	15-30	10-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Budihol-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	55-75	40-55	20-35	20-25	NP-5
	2-10	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1, A-2	0-10	70-80	55-75	35-55	20-35	20-25	NP-5
	10	Weathered bedrock	---	---	---	---	---	---	---	---	---
1291*: Petspring-----	0-1	Very gravelly coarse sandy loam.	SM	A-1	0-20	80-90	30-50	15-30	10-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
Uripnes-----	0-3	Very gravelly sandy loam.	SM	A-1	5-10	75-90	30-50	25-35	10-25	20-25	NP-5
	3-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1291*: Beelem-----	0-1	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-85	30-50	25-35	15-30	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1301----- Sundown	0-3	Loamy sand-----	SM	A-1	0-5	95-100	85-100	25-40	10-25	---	NP
	3-60	Loamy fine sand	SM	A-2	0-5	95-100	85-100	70-85	15-30	---	NP
1310*: Typic Torriorthents--	0-6	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
Gynelle-----	0-2	Very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-60	30-50	15-35	5-15	---	NP
	2-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	35-60	20-40	10-20	---	NP
Oricto-----	0-3	Very gravelly sandy loam.	GM	A-1, A-2	10-25	40-60	35-55	25-45	15-30	15-25	NP-5
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	0-30	30-60	25-50	10-35	0-15	---	NP
1320*: Belted-----	0-4	Very gravelly loam.	GM-GC	A-2	0-10	35-65	30-50	20-45	15-35	25-30	5-10
	4-10	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	10-34 34-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	---	---	---	---	---	---	---	---	---
			GP	A-1	0-10	30-50	20-35	5-15	0-5	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1320*: Downeyville-----	0-4	Very gravelly sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	20-45	15-30	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1322*: Belted-----	0-4	Very gravelly loam.	GM-GC	A-2	0-10	35-65	30-50	20-45	15-35	25-30	5-10
	4-10	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	10-34 34-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	---	---	---	---	---	---	---	---	---
Annaw-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
1323*: Belted-----	0-4	Very gravelly loam.	GM-GC	A-2	0-10	35-65	30-50	20-45	15-35	25-30	5-10
	4-10	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	10-34 34-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	---	---	---	---	---	---	---	---	---
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plasticity index
			Unified	AASHTO		4	10	40	200		
1324*: Belted-----	0-2	Very stony loam	SM-SC, CL-ML	A-4	15-30	70-90	60-80	45-65	35-55	25-30	5-10
	2-7	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	7-31 31-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	---	---	---	---	---	---	---	---	---
Annaw-----	0-2	Very stony loamy sand.	GM, GP-GM	A-1	25-40	30-55	25-45	10-30	5-15	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
1325*: Belted-----	0-2	Very cobbly sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	30-45	50-65	45-60	30-50	15-25	20-30	NP-10
	2-7	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	7-31 31-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	---	---	---	---	---	---	---	---	---
Terlco-----	0-2	Very gravelly sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	2-11	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	11-18	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	18-60	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1326*: Belted-----	0-4	Very gravelly loam.	GM-GC	A-2	0-10	35-65	30-50	20-45	15-35	25-30	5-10
	4-10	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	10-34 34-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	GP	A-1	0-10	30-50	20-35	5-15	0-5	---	NP
Breko-----	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-5	65-80	55-75	35-60	15-35	15-25	NP-5
	6-21	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	35-60	25-50	15-45	10-35	30-40	10-20
	21-29	Extremely gravelly sandy clay loam.	GP-GC	A-2	0	25-40	10-25	10-20	5-10	30-40	10-20
	29-60	Stratified gravelly sandy loam to extremely gravelly loamy sand.	GP-GM	A-1	0	35-45	10-35	5-15	5-10	15-25	NP-5
1327*: Belted-----	0-2	Very cobbly sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	30-45	50-65	45-60	30-50	15-25	20-30	NP-10
	2-7	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	7-31 31-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	GP	A-1	0-10	30-50	20-35	5-15	0-5	---	NP
Lathrop-----	0-5	Very stony fine sandy loam.	SM-SC, GM-GC, SM, GM	A-1, A-2	25-45	50-75	45-65	30-50	20-30	20-30	NP-10
	5-11	Gravelly sandy clay loam, clay loam, loam.	SC, GC, CL	A-6	0-15	60-95	55-85	50-75	35-55	30-40	10-15
	11-30	Very gravelly loamy coarse sand, extremely cobbly loamy sand, very cobbly sand.	SP-SM, GP, SP, GP-GM	A-1	15-65	15-60	10-40	5-25	0-10	---	NP
	30-60	Extremely gravelly coarse sand, very cobbly sand, extremely cobbly sand.	GP, SP	A-1	15-65	15-60	10-40	5-25	0-5	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1328*: Belted-----	0-4	Very gravelly loam.	GM-GC	A-2	0-10	35-65	30-50	20-45	15-35	25-30	5-10
	4-10	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	10-34 34-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	GP	A-1	0-10	30-50	20-35	5-15	0-5	---	NP
Zadvar-----	0-3	Gravelly fine sandy loam.	SM	A-2, A-1	0-5	60-80	50-75	40-60	20-35	20-25	NP-5
	3-10	Gravelly clay loam, sandy clay loam.	GC, CL, SC	A-6	0-5	60-90	55-85	45-75	35-60	35-40	15-20
	10-25 25-60	Cemented----- Stratified extremely gravelly sandy loam to very gravelly coarse sand.	GM, GP-GM	A-1	0-15	35-55	25-50	15-35	5-15	---	NP
1329*: Belted-----	0-3	Gravelly sandy loam.	GM, SM	A-1, A-2	0	55-80	50-75	35-55	20-35	20-25	NP-5
	3-7	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	80-100	75-100	60-80	40-65	25-35	10-20
	7-24 24-60	Cemented----- Fine sandy loam, sandy loam, gravelly sandy loam.	SM, ML	A-2, A-4	0	65-100	60-100	50-80	30-55	20-25	NP-5
Koyen-----	0-3	Fine sandy loam	SM	A-4	0	90-100	85-100	75-90	35-50	15-25	NP-5
	3-17	Sandy loam-----	SM	A-4	0	90-95	85-95	50-75	35-50	15-25	NP-5
	17-44	Stratified loam to gravelly loamy sand.	SM	A-2, A-4	0	80-90	75-85	50-60	25-40	15-25	NP-5
	44-60	Gravelly loamy sand, very gravelly loamy sand.	GP-GM, GM, SP-SM, SM	A-1	0	50-60	45-55	25-35	5-15	---	NP
1340*: Barnmot-----	0-2	Very gravelly sandy clay loam.	GC	A-2	0-5	40-60	30-45	25-40	20-30	30-40	10-20
	2-60	Clay, clay loam	CH, MH	A-7	0	90-100	90-100	80-95	70-85	50-60	20-30

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1340*: Belted-----	0-4	Very gravelly loam.	GM-GC	A-2	0-10	35-65	30-50	20-45	15-35	25-30	5-10
	4-10	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	10-34 34-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	---	---	---	---	---	---	---	---	---
1341*: Barnmot-----	0-1	Gravelly clay loam.	SC	A-6	0-5	75-85	55-75	45-60	35-45	35-40	15-20
	1-60	Clay, clay loam	CH, MH	A-7	0	90-100	90-100	80-95	70-85	50-60	20-30
Haarvar-----	0-1	Gravelly clay loam.	CL	A-7	0	65-80	60-75	55-70	50-65	40-45	25-30
	1-14 14	Clay----- Weathered bedrock	CL, CH ---	A-7 ---	0 ---	95-100 ---	90-100 ---	85-95 ---	75-85 ---	45-60 ---	30-45 ---
1342*: Barnmot-----	0-2	Gravelly clay loam.	SC	A-6	0-5	75-85	55-75	45-60	35-45	35-40	15-20
	2-60	Clay, clay loam	CH, MH	A-7	0	90-100	90-100	80-95	70-85	50-60	20-30
Badland.											
1350*: Calpeak-----	0-2	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	30-50	20-40	15-30	20-25	NP-5
	2-5	Very gravelly sandy loam.	SM	A-1, A-2	0-5	70-80	30-50	20-40	15-30	20-25	NP-5
	5-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Very stony loamy coarse sand.	SM, GM	A-1	15-30	50-65	40-60	15-30	10-15	---	NP
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Tejabe-----	0-1	Very stony sandy loam.	SM, GM	A-2	15-30	60-70	40-60	35-45	25-35	20-25	NP-5
	1-9	Very gravelly sandy loam.	GM	A-1, A-2	0-10	45-60	30-50	25-40	15-30	20-25	NP-5
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1351*: Calpeak-----	0-2	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	30-50	20-40	15-30	20-25	NP-5
	2-5	Very gravelly sandy loam.	SM	A-1, A-2	0-5	70-80	30-50	20-40	15-30	20-25	NP-5
	5-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Goldyke-----	0-3	Very gravelly sandy loam.	SM	A-1	0-10	70-80	30-55	20-35	10-20	20-25	NP-5
	3-6	Gravelly sandy loam, gravelly fine sandy loam.	SM-SC, SM	A-2, A-1	0	60-80	50-75	40-65	10-35	20-30	NP-10
	6-22	Weathered bedrock	---	---	---	---	---	---	---	---	---
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1353*: Calpeak-----	0-2	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	30-50	20-40	15-30	20-25	NP-5
	2-5	Very gravelly sandy loam.	SM	A-1, A-2	0-5	70-80	30-50	20-40	15-30	20-25	NP-5
	5-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Goldyke-----	0-3	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-85	55-70	30-50	15-30	20-25	NP-5
	3-6	Gravelly sandy loam, gravelly fine sandy loam.	SM-SC, SM	A-2, A-1	0	60-80	50-75	40-65	10-35	20-30	NP-10
	6-22	Weathered bedrock	---	---	---	---	---	---	---	---	---
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1354*: Calpeak-----	0-2	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	30-50	20-40	15-30	20-25	NP-5
	2-5	Very gravelly sandy loam.	SM	A-1, A-2	0-5	70-80	30-50	20-40	15-30	20-25	NP-5
	5-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1354*: Lomoine-----	0-4	Very gravelly sandy loam.	SP-SM, GP-GM, SM, GM	A-1	0-25	45-70	35-50	20-35	5-20	15-25	NP-5
	4-8	Very gravelly sandy loam, very gravelly coarse sandy loam.	SM, GM	A-1	0-30	45-70	30-50	15-35	10-20	15-25	NP-5
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1361*: Gabbvally-----	0-2	Very stony loamy coarse sand.	SM, GM	A-1	15-30	50-65	40-60	15-30	10-15	---	NP
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Tejabe-----	0-1	Very stony sandy loam.	SM, GM	A-2	15-30	60-70	40-60	35-45	25-35	20-25	NP-5
	1-9	Very gravelly sandy loam.	GM	A-1, A-2	0-10	45-60	30-50	25-40	15-30	20-25	NP-5
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mirkwood-----	0-1	Extremely stony sandy loam.	GM-GC, GM	A-2, A-1	40-50	40-60	25-40	20-35	15-25	15-25	NP-10
	1-5	Very gravelly loam, very gravelly clay loam.	GC, SC	A-2	5-15	60-75	40-55	30-50	25-35	35-45	15-20
	5	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1362*: Gabbvally-----	0-2	Very gravelly sandy loam.	GM	A-1	0-10	50-60	35-45	25-40	15-25	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Very gravelly sandy loam.	GM	A-1	0-10	50-60	35-45	25-40	15-25	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1362*: Stewal-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1363----- Gabbvally	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1365*: Gabbvally-----	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1366*: Gabbvally-----	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Beelem-----	0-1	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-85	30-50	25-35	15-30	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1420*: Dedmount-----	0-2	Silty clay loam	ML	A-6	0	100	100	95-100	90-100	35-40	10-15
	2-66	Silty clay loam, silty clay.	ML, MH	A-7	0	100	100	95-100	90-100	40-55	15-25

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1420*: Slaw-----	0-9	Silt loam-----	CL-ML	A-4	0	95-100	95-100	85-100	75-90	25-30	5-10
	9-48	Stratified very fine sandy loam to silty clay.	ML, CL	A-6, A-7	0	100	100	95-100	85-95	35-45	10-20
	48-60	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-4, A-2, A-6	0	95-100	95-100	70-80	30-50	20-35	NP-15
1440*: Slaw-----	0-9	Silt loam-----	CL-ML	A-4	0	95-100	95-100	85-100	75-90	25-30	5-10
	9-48	Stratified very fine sandy loam to silty clay.	ML, CL	A-6, A-7	0	100	100	95-100	85-95	35-45	10-20
	48-60	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-4, A-2, A-6	0	95-100	95-100	70-80	30-50	20-35	NP-15
Isolde-----	0-6	Fine sand-----	SP, SP-SM	A-3	0	100	100	75-90	0-10	---	NP
	6-60	Fine sand, sand	SP, SP-SM	A-3	0	100	100	50-80	0-10	---	NP
Cirac-----	0-5	Sandy clay loam	CL	A-6	0	100	75-100	60-75	50-60	30-40	10-20
	5-60	Stratified gravelly sand to silt loam.	SM	A-4	0	100	75-100	50-70	35-50	15-25	NP-5
1441----- Slaw	0-9	Silt loam-----	CL-ML	A-4	0	95-100	95-100	85-100	75-90	25-30	5-10
	9-48	Stratified very fine sandy loam to silty clay.	ML, CL	A-6, A-7	0	100	100	95-100	85-95	35-45	10-20
	48-60	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-4, A-2, A-6	0	95-100	95-100	70-80	30-50	20-35	NP-15
1442*: Slaw-----	0-9	Silt loam-----	CL-ML	A-4	0	95-100	95-100	85-100	75-90	25-30	5-10
	9-48	Stratified very fine sandy loam to silty clay.	ML, CL	A-6, A-7	0	100	100	95-100	85-95	35-45	10-20
	48-60	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-4, A-2, A-6	0	95-100	95-100	70-80	30-50	20-35	NP-15
Playas.											
1445*: Slaw-----	0-9	Silt loam-----	CL-ML	A-4	0	95-100	95-100	85-100	75-90	25-30	5-10
	9-41	Silt loam, silty clay loam.	ML, CL	A-6, A-7	0	100	100	95-100	85-95	35-45	10-20
	41-60	Stratified sand to silt loam.	ML, SM	A-4	0	100	100	85-95	40-55	---	NP
Slaw-----	0-9	Silt loam-----	ML, CL-ML	A-4	0	100	100	95-100	80-90	25-35	5-10
	9-40	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-95	25-40	5-20
	40-60	Stratified loamy fine sand to silt loam.	SM	A-4	0	100	100	80-90	35-50	20-25	NP-5

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1445*: Fallon-----	0-8 8-60	Loamy fine sand Stratified sand to silt loam.	SM SM, ML	A-2, A-4 A-4	0 0	100 95-100	100 85-100	75-85 75-90	30-40 40-60	--- 20-25	NP NP-5
1450*: Nuyobe-----	0-6 6-60	Silty clay loam Stratified very fine sandy loam to silty clay loam.	CL, ML CL, ML	A-7 A-6	0 0	100 100	100 100	100 95-100	80-95 75-95	40-50 35-40	15-20 10-15
Playas.											
1451*: Nuyobe-----	0-6 6-60	Silty clay loam Stratified very fine sandy loam to silty clay loam.	ML, CL ML, CL	A-7 A-6	0 0	100 100	100 100	100 95-100	80-95 75-95	40-50 35-40	15-20 10-15
Slaw-----	0-9 9-48 48-60	Silt loam----- Stratified very fine sandy loam to silty clay. Sandy loam, fine sandy loam, sandy clay loam.	CL-ML ML, CL SM-SC, SC, SM	A-4 A-6, A-7 A-4, A-2, A-6	0 0 0	95-100 100 95-100	95-100 100 95-100	85-100 95-100 70-80	75-90 85-95 30-50	25-30 35-45 20-35	5-10 10-20 NP-15
1480*: Fawin-----	0-5 5-11 11-34 34-60	Fine sandy loam Fine sandy loam, sandy loam. Loamy sand, sand Gravelly coarse sand, gravelly sand, gravelly loamy sand.	SM SM SM SM, SP-SM	A-2 A-2 A-2 A-1	0 0 0-5 0-5	95-100 90-100 95-100 70-85	85-100 80-90 85-100 55-75	60-75 50-65 50-60 25-50	15-30 25-35 15-25 5-20	--- 15-25 --- ---	NP NP-5 NP NP
Crunker-----	0-12 12-60	Loamy sand----- Stratified gravelly coarse sand to extremely gravelly sandy loam.	SM GP-GM, GM	A-2 A-1	0 5-15	80-95 35-55	75-90 30-50	50-65 20-35	20-35 5-15	--- ---	NP NP
1482*: Fawin-----	0-5 5-11 11-34 34-60	Gravelly fine sandy loam. Fine sandy loam, sandy loam. Loamy sand, sand Gravelly coarse sand, gravelly sand, gravelly loamy sand.	SM SM SM SM, SP-SM	A-1, A-2 A-2 A-2 A-1	0-5 0 0-5 0-5	75-85 90-100 95-100 70-85	50-75 80-90 85-100 55-75	45-65 50-65 50-60 25-50	15-25 25-35 15-25 5-20	--- 15-25 --- ---	NP NP-5 NP NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1482*: Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1483----- Fawin	0-5	Fine sandy loam	SM	A-2	0	95-100	85-100	60-75	15-30	---	NP
	5-11	Fine sandy loam, sandy loam.	SM	A-2	0	90-100	80-90	50-65	25-35	15-25	NP-5
	11-34	Loamy sand, sand	SM	A-2	0-5	95-100	85-100	50-60	15-25	---	NP
	34-60	Gravelly coarse sand, gravelly sand, gravelly loamy sand.	SM, SP-SM	A-1	0-5	70-85	55-75	25-50	5-20	---	NP
1490*: Ratleflat-----	0-9	Gravelly loamy sand.	SM	A-1, A-2	0-5	85-95	50-75	25-40	15-30	---	NP
	9-22	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-2	0-5	85-95	50-75	35-50	25-35	20-30	NP-5
	22-60	Stratified very gravelly loamy sand to very gravelly coarse sand.	SP-SM, SM	A-1	0-5	75-95	25-50	15-30	5-15	---	NP
Crunker-----	0-12	Loamy sand-----	SM	A-2	0	80-95	75-90	50-65	20-35	---	NP
	12-60	Stratified gravelly coarse sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	5-15	35-55	30-50	20-35	5-15	---	NP
1492*: Ratleflat-----	0-9	Gravelly loamy sand.	SM	A-1, A-2	0-5	85-95	50-75	25-40	15-30	---	NP
	9-22	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-2	0-5	85-95	50-75	35-50	25-35	20-30	NP-5
	22-60	Stratified very gravelly loamy sand to very gravelly coarse sand.	SP-SM, SM	A-1	0-5	75-95	25-50	15-30	5-15	---	NP
Wiskiflat-----	0-10	Gravelly loamy sand.	SM	A-1, A-2	0-10	75-90	50-75	30-45	15-30	---	NP
	10-60	Stratified very gravelly sandy loam to very gravelly coarse sand.	SM	A-1	0-10	55-75	30-50	20-40	10-25	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
1500*: Chuckridge-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	50-75	30-45	20-35	20-25	NP-5
	2-12	Gravelly loam, gravelly sandy clay loam, gravelly clay loam.	SC	A-6	0-5	70-85	50-75	45-60	35-50	30-40	10-15
	12-26	Indurated-----	---	---	---	---	---	---	---	---	---
	26-60	Very gravelly sandy loam, very gravelly loamy sand.	GM	A-1	0-15	40-55	25-50	15-35	10-20	---	NP
Crunker-----	0-12	Very gravelly sandy loam.	SM, GM	A-1	5-10	50-65	35-50	25-40	10-25	15-25	NP-5
	12-60	Stratified gravelly coarse sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	5-15	35-55	30-50	20-35	5-15	---	NP
1510*: Advokay-----	0-6	Sandy loam-----	SM	A-2	0	95-100	85-100	55-70	25-35	---	NP
	6-11	Gravelly sandy clay loam.	SC, GC	A-2	0	55-80	50-75	30-55	20-35	30-40	10-15
	11-15	Weathered bedrock	---	---	---	---	---	---	---	---	---
Budihol-----	0-3	Stony sandy loam	SM	A-1, A-2	5-15	60-80	55-75	40-55	20-35	20-25	NP-5
	3-7	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	20-25	NP-5
	7-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
Pumel-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-15	65-90	50-70	35-55	15-25	20-25	NP-5
	2-5	Very gravelly coarse sandy loam, extremely gravelly sandy loam.	SM, GM	A-1	10-25	40-70	25-50	10-35	10-15	20-25	NP-5
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
1511----- Advokay	0-3	Sandy loam-----	SM	A-2	0	95-100	85-100	55-70	25-35	---	NP
	3-7	Gravelly sandy clay loam.	SC, GC	A-2	0	55-80	50-75	30-55	20-35	30-40	10-15
	7	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO							
						4	10	40	200		
In					Pct				Pct		
1530*: Dakent-----	0-3	Gravelly very fine sandy loam.	SM	A-2	0-5	80-90	60-75	50-70	20-35	20-25	NP-5
	3-11	Gravelly sandy loam, gravelly loam.	SM, SM-SC	A-2, A-4	0-5	70-80	50-65	40-55	25-40	20-30	NP-10
	11-34	Extremely gravelly sandy loam, extremely gravelly loam.	GM	A-1	5-10	25-35	15-25	10-20	10-15	15-25	NP-5
	34-60	Extremely gravelly coarse sand, extremely gravelly sand, extremely gravelly loamy sand.	GP	A-1	5-10	25-35	15-25	5-15	0-5	---	NP
Crunker-----	0-12	Gravelly sandy loam.	SM	A-2	5-10	75-90	55-70	40-55	25-35	15-25	NP-5
	12-60	Stratified gravelly coarse sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	5-15	35-55	30-50	20-35	5-15	---	NP
1540*: Beano-----	0-7	Sandy loam-----	SM	A-2, A-4	0	95-100	85-100	55-70	30-45	15-25	NP-5
	7-18	Very gravelly clay loam, very gravelly loam, very gravelly sandy clay loam.	GC	A-2	0-10	50-60	30-50	25-45	20-30	25-40	10-20
	18-35	Cemented-----	---	---	---	---	---	---	---	---	---
	35-60	Stratified extremely gravelly coarse sand to extremely gravelly loamy sand.	GP-GM	A-1	0-10	20-40	15-30	10-20	5-10	---	NP
Annaw-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1551*: Typic Torriorthents--	0-6	Very gravelly sandy loam.	GM	A-1	0-10	45-60	35-55	20-35	10-20	15-20	NP-5
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
Unsel-----	0-4	Very gravelly loam.	GM-GC, SM-SC	A-2	15-30	40-70	35-60	30-50	15-35	20-25	5-10
	4-10	Gravelly clay loam, gravelly sandy clay loam.	SC	A-6	0	75-85	55-75	45-60	35-45	35-40	15-20
	10-31	Gravelly sandy loam, gravelly sandy clay loam.	SM-SC	A-2	0	60-75	50-70	35-50	20-35	20-30	5-10
	31-60	Very gravelly sand, very gravelly loamy sand, extremely gravelly sand.	GP-GM, GP	A-1	0	40-50	20-35	10-25	0-10	---	NP
1570*: Budihol-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	55-75	40-55	20-35	20-25	NP-5
	2-10	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1, A-2	0-10	70-80	55-75	35-55	20-35	20-25	NP-5
	10	Weathered bedrock	---	---	---	---	---	---	---	---	---
Uripnes-----	0-3	Very stony sandy loam.	SM	A-1	20-35	75-90	30-50	25-35	10-25	20-25	NP-5
	3-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Petspring-----	0-1	Very gravelly coarse sandy loam.	SM	A-1	0-20	80-90	30-50	15-30	10-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
1580*: Rockabin-----	0-8	Very gravelly coarse sandy loam.	SM	A-1	0-10	75-85	30-50	15-35	10-25	20-25	NP-5
	8-21	Very gravelly coarse sandy loam.	SM	A-1	0-10	75-85	25-50	15-35	10-25	20-25	NP-5
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1580*: Hiridge-----	0-4	Very gravelly sandy loam.	SM	A-1	0-15	80-90	30-50	20-40	10-25	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23 23	Weathered bedrock Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1590*: Snopoc-----	0-17	Stony coarse sandy loam.	SM	A-1	5-15	75-90	30-50	20-35	10-25	20-25	NP-5
	17-60	Extremely gravelly coarse sandy loam.	SP-SM, SM, SP	A-1	0-10	75-90	10-30	5-25	0-15	20-25	NP-5
Rockabin-----	0-8	Very gravelly coarse sandy loam.	SM	A-1	0-10	75-85	30-50	15-35	10-25	20-25	NP-5
	8-21	Very gravelly coarse sandy loam.	SM	A-1	0-10	75-85	25-50	15-35	10-25	20-25	NP-5
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
Fusuvar-----	0-2	Very bouldery sandy loam.	SM	A-1, A-2	10-20	90-95	75-90	40-55	15-25	20-25	NP-5
	2-14	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1	0	90-95	50-75	30-45	10-25	20-25	NP-5
	14	Weathered bedrock	---	---	---	---	---	---	---	---	---
1591*: Snopoc-----	0-17	Very gravelly coarse sandy loam.	SM, SP-SM	A-1	0-5	80-95	25-45	15-30	5-25	20-25	NP-5
	17-60	Extremely gravelly coarse sandy loam.	SP-SM, SM, SP	A-1	0-10	75-90	10-30	5-25	0-15	20-25	NP-5
Rockabin-----	0-8	Very gravelly coarse sandy loam.	SM	A-1	0-10	75-85	30-50	15-35	10-25	20-25	NP-5
	8-21	Very gravelly coarse sandy loam.	SM	A-1	0-10	75-85	25-50	15-35	10-25	20-25	NP-5
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
Hiridge-----	0-4	Very gravelly sandy loam.	SM	A-1	0-15	80-90	30-50	20-40	10-25	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23 23	Weathered bedrock Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1600*: Nupart-----	0-2	Very gravelly loamy sand.	SM	A-1	0-15	75-85	30-50	15-25	10-15	---	NP
	2-5	Very gravelly loamy coarse sand.	SP-SM, SM	A-1	0-10	70-85	25-50	10-25	5-15	---	NP
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
Lazan-----	0-1	Very gravelly coarse sand.	SP, SP-SM	A-1	0-10	60-80	30-50	10-25	0-10	---	NP
	1-4	Very gravelly loamy coarse sand, very gravelly coarse sand.	SP-SM, SM	A-1	0-10	60-80	30-50	20-35	5-15	---	NP
	4	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1601*: Nupart-----	0-2	Very gravelly coarse sandy loam.	SM	A-1	5-15	80-90	30-50	15-30	10-20	20-25	NP-5
	2-5	Very gravelly loamy coarse sand.	SP-SM, SM	A-1	0-10	70-85	25-50	10-25	5-15	---	NP
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1632*: Annaw-----	0-2	Very gravelly loamy sand.	GM, SM	A-1	0-25	40-60	35-50	25-35	10-15	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
Wardenot-----	0-5	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1632*: Pintwater-----	0-6	Very gravelly fine sandy loam.	GM	A-1	0-10	35-60	30-50	20-40	10-25	20-25	NP-5
	6-11	Extremely gravelly sandy loam, very gravelly fine sandy loam.	GM	A-1	0-15	35-50	20-40	15-35	10-20	20-25	NP-5
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1641*: Unsel-----	0-5	Very gravelly fine sandy loam.	GM-GC, SM-SC	A-2	15-30	40-70	35-60	30-50	15-35	20-25	5-10
	5-11	Gravelly clay loam, gravelly sandy clay loam.	SC	A-6	0	75-85	55-75	45-60	35-45	35-40	15-20
	11-30	Gravelly sandy loam, gravelly sandy clay loam.	SM-SC	A-2	0	60-75	50-70	35-50	20-35	20-30	5-10
	30-60	Very gravelly sand, very gravelly loamy sand, extremely gravelly sand.	GP-GM, GP	A-1	0	40-50	20-35	10-25	0-10	---	NP
Annaw-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
1643*: Unsel-----	0-4	Very gravelly fine sandy loam.	GM-GC, SM-SC	A-2	15-30	40-70	35-60	30-50	15-35	20-25	5-10
	4-10	Gravelly clay loam, gravelly sandy clay loam.	SC	A-6	0	75-85	55-75	45-60	35-45	35-40	15-20
	10-31	Gravelly sandy loam, gravelly sandy clay loam.	SM-SC	A-2	0	60-75	50-70	35-50	20-35	20-30	5-10
	31-60	Very gravelly sand, very gravelly loamy sand, extremely gravelly sand.	GP-GM, GP	A-1	0	40-50	20-35	10-25	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit  Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>						
1643*: Annaw-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1670----- Bouncer	0-3	Gravelly loamy fine sand.	SM, GM	A-2, A-1	0-10	60-80	50-75	45-55	15-25	20-25	NP-5
	3-10	Very gravelly loam.	GC, SC	A-2	0-10	45-70	30-50	25-45	20-35	25-35	10-15
	10-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1680*: Lazan-----	0-1	Gravelly loamy sand.	SM	A-1	0-10	80-90	50-65	30-40	10-20	---	NP
	1-4	Very gravelly loamy coarse sand, very gravelly coarse sand.	SP-SM, SM	A-1	0-10	60-80	30-50	20-35	5-15	---	NP
	4	Weathered bedrock	---	---	---	---	---	---	---	---	---
Lazan-----	0-1	Gravelly loamy sand.	SM	A-1	0-10	80-90	50-65	30-40	10-20	---	NP
	1-4	Very gravelly loamy coarse sand, very gravelly coarse sand.	SP-SM, SM	A-1	0-10	60-80	30-50	20-35	5-15	---	NP
	4	Weathered bedrock	---	---	---	---	---	---	---	---	---
Nupart-----	0-2	Very gravelly loamy sand.	SM	A-1	0-15	75-85	30-50	15-25	10-15	---	NP
	2-5	Very gravelly loamy coarse sand.	SP-SM, SM	A-1	0-10	70-85	25-50	10-25	5-15	---	NP
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1691*: Crunkvar-----	0-10	Gravelly loamy sand.	SM	A-1	0	90-95	55-75	30-45	10-20	---	NP
	10-60	Stratified gravelly coarse sandy loam to very gravelly sand.	SM, SP-SM	A-1	0	80-90	30-50	15-30	5-20	---	NP
Lazan-----	0-1	Gravelly loamy sand.	SM	A-1	0-10	80-90	50-65	30-40	10-20	---	NP
	1-4	Very gravelly loamy coarse sand, very gravelly coarse sand.	SP-SM, SM	A-1	0-10	60-80	30-50	20-35	5-15	---	NP
	4	Weathered bedrock	---	---	---	---	---	---	---	---	---
1700*: Granmount-----	0-10	Very gravelly fine sandy loam.	GM, SM	A-1, A-2	5-25	45-65	35-55	30-45	20-30	20-30	NP-5
	10-33	Extremely gravelly clay, very gravelly clay.	GC	A-2	10-25	20-50	15-45	10-45	10-35	45-55	20-25
	33-60	Very cobbly clay loam.	GC	A-6, A-7	40-50	60-70	50-60	40-55	35-45	35-45	15-20
Kiote-----	0-8	Gravelly loam----	GM, SM, SM-SC, GM-GC	A-2, A-4	0-5	60-85	50-75	35-50	25-40	20-30	NP-10
	8-18	Very gravelly loam.	GM-GC	A-2	0-5	50-65	25-50	20-35	15-30	20-30	5-10
	18-38	Very gravelly loam.	GC	A-2	5-20	40-55	25-45	20-35	15-30	25-35	10-15
	38-60	Extremely gravelly loam, extremely gravelly sandy loam, extremely gravelly coarse sandy loam.	GP-GC, GP-GM	A-1, A-2	5-15	20-35	15-25	10-15	5-10	20-30	NP-10
Hiridge-----	0-4	Very gravelly sandy loam.	SM	A-1	0-15	80-90	30-50	20-40	10-25	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23	Weathered bedrock	---	---	---	---	---	---	---	---	---
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1710----- Troutville Variant	0-4	Very bouldery sandy loam.	SM	A-1	10-25	75-90	55-75	35-50	15-25	25-30	NP-5
	4-20	Very gravelly sandy loam, very gravelly loamy sand.	SM	A-1	10-15	60-80	30-45	20-35	15-20	20-25	NP-5
	20-45	Very gravelly sandy loam.	SM	A-1	10-15	60-85	30-55	20-35	15-25	20-25	NP-5
	45-60	Extremely gravelly coarse sandy loam.	SP-SM, GP-GM	A-1	10-25	50-60	20-30	10-20	5-10	15-20	NP-5
1730*: Bijorja-----	0-4	Loamy coarse sand	SM	A-1, A-2	0	95-100	75-85	30-50	20-30	---	NP
	4-30	Gravelly coarse sandy loam.	SM	A-1	0	95-100	50-75	20-40	15-25	20-25	NP-5
	30	Weathered bedrock	---	---	---	---	---	---	---	---	---
Petspring-----	0-1	Very gravelly coarse sandy loam.	SM	A-1	0-20	80-90	30-50	15-30	10-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
1750*: Wedlar-----	0-6	Stony sandy loam	SM	A-1, A-2	10-15	60-80	55-75	40-55	20-35	20-25	NP-5
	6-14	Loam-----	CL-ML	A-4	0-5	90-100	85-100	75-90	50-75	25-30	5-10
	14-37	Sandy clay loam, sandy clay.	SC	A-2, A-6, A-7	0-5	85-95	75-90	60-75	30-50	35-45	15-20
	37-60	Gravelly sandy loam, gravelly loamy sand.	SM, SM-SC, GM, GM-GC	A-1, A-2, A-4	0-10	55-80	50-75	35-60	15-40	15-30	NP-10
Tert-----	0-3	Loam-----	CL, CL-ML	A-4, A-6	0	80-100	75-100	70-95	50-65	25-35	5-15
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1753----- Wedlar	0-5	Sand-----	SM	A-1, A-2	0	85-100	75-100	40-65	10-15	---	NP
	5-11	Loam-----	CL-ML	A-4	0-5	90-100	85-100	75-90	50-75	25-30	5-10
	11-31	Sandy clay loam, sandy clay.	SC	A-2, A-6, A-7	0-5	85-95	75-90	60-75	30-50	35-45	10-15
	31-60	Gravelly sandy loam, gravelly loamy sand.	SM, SM-SC, GM, GM-GC	A-1, A-2	0-5	55-80	50-75	35-60	15-35	15-30	NP-10
1780*: Borealis-----	0-11	Very stony fine sandy loam.	SM	A-2	5-35	80-100	75-90	50-60	20-35	15-25	NP-5
	11-23	Gravelly clay loam, gravelly clay.	CH, CL, GC	A-7	0-5	55-80	50-75	45-70	35-60	40-55	15-30
	23-40	Indurated-----	---	---	---	---	---	---	---	---	---
40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	
Rock outcrop.											

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1781*: Borealis-----	0-11	Very stony fine sandy loam.	SM	A-2	5-35	80-100	75-90	50-60	20-35	15-25	NP-5
	11-23	Gravelly clay loam, gravelly clay.	CH, CL, GC	A-7	0-5	55-80	50-75	45-70	35-60	40-55	15-30
	23-40	Indurated-----	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Antholop-----	0-6	Very cobbly sandy loam.	SM	A-1, A-2	30-40	60-85	55-80	40-65	15-35	---	NP
	6-16	Clay-----	CH, CL	A-7	0-5	90-100	75-100	70-90	50-65	45-60	20-30
	16-60	Indurated-----	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1782*: Borealis-----	0-11	Very stony fine sandy loam.	SM	A-2	5-35	80-100	75-90	50-60	20-35	15-25	NP-5
	11-23	Gravelly clay loam, gravelly clay.	CH, CL, GC	A-7	0-5	55-80	50-75	45-70	35-60	40-55	15-30
	23-40	Indurated-----	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mopana-----	0-4	Stony fine sandy loam.	SM	A-2, A-4	10-15	80-90	75-90	65-75	30-40	30-40	NP-5
	4-8	Loam-----	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	75-85	55-65	25-35	5-15
	8-19	Gravelly clay loam, clay.	SC, CL, CH	A-7	0-10	70-95	60-100	55-85	45-75	40-55	20-30
	19-60	Indurated-----	---	---	---	---	---	---	---	---	---
1783*: Borealis-----	0-11	Very stony fine sandy loam.	SM	A-2	5-35	80-100	75-90	50-60	20-35	15-25	NP-5
	11-23	Gravelly clay loam, gravelly clay.	CH, CL, GC	A-7	0-5	55-80	50-75	45-70	35-60	40-55	15-30
	23-40	Indurated-----	---	---	---	---	---	---	---	---	---
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Itca-----	0-2	Extremely stony loam.	GM-GC, GC	A-4, A-6	30-50	60-75	50-65	45-60	35-50	25-35	5-15
	2-18	Very cobbly clay loam, very gravelly clay, extremely gravelly clay.	CL, GC	A-7, A-2	0-55	40-80	30-75	25-70	20-60	40-50	15-25
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1790*: Antholop-----	0-6	Stony sandy loam	SM	A-1, A-2	5-15	60-85	55-80	40-65	15-35	---	NP
	6-16	Clay-----	CH, CL	A-7	0-5	90-100	75-100	70-90	50-65	45-60	20-30
	16-60	Indurated-----	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth <u>In</u>	USDA texture	Classification		Frag- ments > 3 inches <u>Pct</u>	Percentage passing sieve number--				Liquid limit <u>Pct</u>	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1790*: Wedlar-----	0-5	Sand-----	SM	A-1, A-2	0	85-100	75-100	40-65	10-15	---	NP
	5-11	Loam-----	CL-ML	A-4	0-5	90-100	85-100	75-90	50-75	25-30	5-10
	11-31	Sandy clay loam, sandy clay.	SC	A-2, A-6, A-7	0-5	85-95	75-90	60-75	30-50	35-45	10-15
	31-60	Gravelly sandy loam, gravelly loamy sand.	SM, SM-SC, GM, GM-GC	A-1, A-2	0-5	55-80	50-75	35-60	15-35	15-30	NP-10
1820*: Lomoin-----	0-4	Very cobbly sandy loam.	GM, SM	A-1	35-45	50-75	35-60	20-30	10-20	15-25	NP-5
	4-8	Very gravelly sandy loam, very gravelly coarse sandy loam.	SM, GM	A-1	0-30	45-70	30-50	15-35	10-20	15-25	NP-5
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Petspring-----	0-1	Very gravelly coarse sandy loam.	SM	A-1	0-20	80-90	30-50	15-30	10-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
Uripnes-----	0-3	Very stony sandy loam.	SM	A-1	20-35	75-90	30-50	25-35	10-25	20-25	NP-5
	3-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1821*: Lomoin-----	0-4	Very cobbly sandy loam.	GM, SM	A-1	35-45	50-75	35-60	20-30	10-20	15-25	NP-5
	4-8	Very gravelly sandy loam, very gravelly coarse sandy loam.	SM, GM	A-1	0-30	45-70	30-50	15-35	10-20	15-25	NP-5
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Budihol-----	0-3	Extremely bouldery sandy loam.	SM	A-1, A-2	20-50	75-95	65-85	45-60	20-35	20-25	NP-5
	3-7	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	20-25	NP-5
	7-21	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1822*: Lomoine-----	0-2	Very cobbly sandy loam.	GM, SM	A-1	35-45	50-75	35-60	20-30	10-20	15-25	NP-5
	2-6	Very gravelly sandy loam, very gravelly coarse sandy loam.	SM, GM	A-1	0-30	45-70	30-50	15-35	10-20	15-25	NP-5
	6	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Petspring-----	0-1	Very gravelly coarse sandy loam.	SM	A-1	0-20	80-90	30-50	15-30	10-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
1825*: Lomoine-----	0-4	Very gravelly sandy loam.	SP-SM, GP-GM, SM, GM	A-1	0-25	45-70	35-50	20-35	5-20	15-25	NP-5
	4-8	Very gravelly sandy loam, very gravelly coarse sandy loam.	SM, GM	A-1	0-30	45-70	30-50	15-35	10-20	15-25	NP-5
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Beelem-----	0-1	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-85	30-50	25-35	15-30	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1840*: Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plasticity index
			Unified	AASHTO		4	10	40	200		
1840*: Gabbvally-----	0-2	Very gravelly sandy loam.	GM	A-1	0-10	50-60	35-45	25-40	15-25	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1842*: Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1843*: Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Logring-----	0-3	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	10-25	20-25	5-10
	3-13	Very gravelly loam, very gravelly fine sandy loam.	GM-GC	A-2	0-10	35-55	30-45	25-35	15-25	20-25	5-10
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1844----- Kyler	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
1860----- Venable Family	0-15	Loam-----	CL-ML, CL	A-4, A-6	0	95-100	90-100	80-90	60-80	20-35	5-20
	15-60	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6	0	95-100	90-100	70-90	55-85	20-40	5-25
1870*: Luning-----	0-4	Loamy sand-----	SM	A-2	0	100	90-100	70-85	20-35	---	NP
	4-60	Stratified sandy loam to very gravelly coarse sand.	SM	A-1, A-2	0-10	75-95	55-90	45-80	10-30	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1870*: Sundown-----	0-3	Loamy fine sand	SM	A-2	0-5	95-100	85-100	70-85	15-30	---	NP
	3-60	Loamy fine sand	SM	A-2	0-5	95-100	85-100	70-85	15-30	---	NP
1871----- Luning	0-4	Sandy loam-----	SM	A-2, A-4	0	95-100	90-100	65-80	30-40	15-25	NP-5
	4-60	Stratified sandy loam to very gravelly coarse sand.	SM	A-1, A-2	0-10	75-95	55-90	45-80	10-30	---	NP
1875*: Luning-----	0-2	Loamy sand-----	SM	A-1, A-2	0	80-95	75-90	45-65	15-30	---	NP
	2-36	Loamy fine sand, fine sand.	SM	A-2	0	90-100	75-100	55-80	10-30	---	NP
	36-60	Stratified very gravelly sand to gravelly loamy fine sand.	GP, SP	A-1	0-10	35-60	25-45	10-30	0-5	---	NP
Hawsley-----	0-8	Loamy sand-----	SM	A-2	0	100	90-100	60-75	20-35	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
Bluewing-----	0-9	Very gravelly loamy sand.	SP-SM	A-1	10-25	70-85	35-45	15-30	5-10	---	NP
	9-60	Stratified very gravelly sand to extremely gravelly loamy coarse sand.	GP-GM, GP	A-1	0-25	40-50	20-35	10-15	0-10	---	NP
1877*: Luning-----	0-6	Loamy sand-----	SM	A-1, A-2	0	80-95	75-90	45-65	15-30	---	NP
	6-35	Loamy fine sand, fine sand.	SM	A-2	0	90-100	75-100	55-80	10-30	---	NP
	35-60	Stratified very gravelly sand to gravelly loamy fine sand.	GP, SP	A-1	0-10	35-60	25-45	10-30	0-5	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1878*: Luning-----	0-6	Loamy sand-----	SM	A-1, A-2	0	80-95	75-90	45-65	15-30	---	NP
	6-35	Loamy fine sand, fine sand.	SM	A-2	0	90-100	75-100	55-80	10-30	---	NP
	35-60	Stratified very gravelly sand to gravelly loamy fine sand.	GP, SP	A-1	0-10	35-60	25-45	10-30	0-5	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1878*: Oricto-----	0-3	Gravelly loamy sand.	SM	A-1, A-2	0-10	70-80	55-75	45-60	20-35	---	NP
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	0-30	30-60	25-50	10-35	0-15	---	NP
1879*: Luning-----	0-6	Gravelly loamy sand.	SM	A-1	0-10	60-75	55-70	30-50	10-20	---	NP
	6-35	Loamy fine sand, fine sand.	SM	A-2	0	90-100	75-100	55-80	10-30	---	NP
	35-60	Stratified very gravelly sand to gravelly loamy fine sand.	GP, SP	A-1	0-10	35-60	25-45	10-30	0-5	---	NP
Eastgate-----	0-5	Gravelly loamy sand.	SM	A-1	0	60-75	55-70	30-50	10-20	---	NP
	5-17	Gravelly sandy loam, sandy loam.	SM	A-1, A-2	0	75-95	70-90	40-55	20-30	15-20	NP-5
	17-25	Gravelly loamy sand, loamy sand.	SM	A-1	0	75-95	70-90	35-50	10-20	---	NP
	25-60	Very gravelly loamy sand.	GP-GM	A-1	0-10	40-55	35-50	15-35	5-10	---	NP
1890*: Wardenot-----	0-5	Very gravelly sandy loam.	GM	A-1	0-10	45-60	35-55	20-35	10-20	15-20	NP-5
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP
Wardenot-----	0-5	Very gravelly sandy loam.	GM	A-1	0-10	45-60	35-55	20-35	10-20	15-20	NP-5
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1890*: Izo-----	0-8	Very gravelly sand.	GM, GP-GM, SM, SP-SM	A-1	0-15	35-60	30-50	15-35	5-15	---	NP
	8-60	Stratified gravelly loamy coarse sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1891*: Wardenot-----	0-5	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP
Izo-----	0-8	Extremely gravelly loamy sand.	GP	A-1	0-15	20-40	10-25	0-10	0-5	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1892*: Wardenot-----	0-4	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	4-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP
Izo-----	0-8	Extremely gravelly loamy sand.	GP	A-1	0-15	20-40	10-25	0-10	0-5	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1893*: Wardenot-----	0-5	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1893*: Annaw-----	0-2	Very gravelly loamy sand.	GM, SM	A-1	0-25	40-60	35-50	25-35	10-15	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1894*: Wardenot-----	0-5	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP
Truhoy-----	0-2	Very gravelly fine sandy loam.	SM, GM	A-1, A-2	0-10	45-65	30-50	25-40	10-30	20-25	NP-5
	2-11	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-5	60-85	50-75	40-55	25-40	20-25	NP-5
	11-17	Cemented-----	---	---	---	---	---	---	---	---	---
	17-60	Stratified very gravelly loamy sand to extremely gravelly coarse sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-65	20-45	15-30	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1897*: Wardenot-----	0-5	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP
Stumble-----	0-12	Loamy fine sand	SM	A-2	0-5	85-100	85-100	75-90	15-25	---	NP
	12-18	Loamy sand, loamy fine sand.	SM	A-2	0-5	85-100	85-100	55-75	15-25	---	NP
	18-60	Gravelly loamy sand, gravelly loamy fine sand.	SM	A-1, A-2	0-10	75-85	50-70	40-60	15-25	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1910*: Izo-----	0-8	Very gravelly sand.	GM, GP-GM, SM, SP-SM	A-1	0-15	35-60	30-50	15-35	5-15	---	NP
	8-60	Stratified gravelly loamy coarse sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
Izo-----	0-3	Very stony loamy sand.	GP-GM	A-1	20-40	30-40	25-35	15-25	5-10	---	NP
	3-60	Stratified gravelly loamy coarse sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1930----- Cirac	0-5	Fine sandy loam	SM	A-4	0	100	75-100	60-75	35-45	15-25	NP-5
	5-60	Stratified gravelly sand to silt loam.	SM	A-4	0	100	75-100	50-70	35-50	15-25	NP-5
1931----- Cirac	0-5	Fine sandy loam	SM	A-4	0	100	75-100	60-75	35-45	15-25	NP-5
	5-60	Stratified gravelly sand to silt loam.	SM	A-4	0	100	75-100	50-70	35-50	15-25	NP-5
1940----- Typic Torriorthents	0-6	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1950*: Lathrop-----	0-5	Very gravelly sandy loam.	GM, GM-GC	A-1, A-2	0-5	40-60	30-50	20-30	10-20	15-25	NP-10
	5-13	Clay loam, gravelly sandy clay loam, loam.	SC, GC, CL	A-6	0-15	60-95	55-85	50-75	35-55	30-40	10-15
	13-25	Extremely cobbly loamy sand, very gravelly loamy coarse sand, very cobbly sand.	GP, SP, GP-GM, SP-SM	A-1	15-65	15-60	10-40	5-30	0-10	---	NP
	25-60	Extremely cobbly sand, very gravelly loamy coarse sand, very cobbly sand.	GP, SP, GP-GM, SP-SM	A-1	15-65	15-60	10-40	5-25	0-10	---	NP
Terlco-----	0-2	Very gravelly fine sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	2-11	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	11-18	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	18-60	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
1951*: Lathrop-----	0-3	Very gravelly sandy loam.	GM, GM-GC	A-1, A-2	0-5	40-60	30-50	20-30	10-20	15-25	NP-10
	3-13	Clay loam, gravelly sandy clay loam, loam.	SC, GC, CL	A-6	0-15	60-95	55-85	50-75	35-55	30-40	10-15
	13-32	Extremely cobbly loamy sand, very gravelly loamy coarse sand, very cobbly sand.	GP, SP, GP-GM, SP-SM	A-1	15-65	15-60	10-40	5-30	0-10	---	NP
	32-60	Extremely cobbly sand, very gravelly loamy coarse sand, very cobbly sand.	GP, SP, GP-GM, SP-SM	A-1	15-65	15-60	10-40	5-25	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1951*: Belted-----	0-2	Very cobbly sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	30-45	50-65	45-60	30-50	15-25	20-30	NP-10
	2-7	Gravelly clay loam, gravelly loam.	SC	A-6	0-10	70-85	55-75	45-60	35-50	30-35	10-15
	7-31 31-60	Cemented----- Extremely gravelly coarse sand, very gravelly coarse sand.	---	---	---	---	---	---	---	---	---
Veet-----	0-5	Very gravelly sandy loam.	SM	A-1	0-10	60-75	30-50	20-45	15-25	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP
1970*: Pintwater-----	0-6	Very gravelly fine sandy loam.	GM	A-1	0-10	35-60	30-50	20-40	10-25	20-25	NP-5
	6-11	Extremely gravelly sandy loam, very gravelly fine sandy loam.	GM	A-1	0-15	35-50	20-40	15-35	10-20	20-25	NP-5
	11-15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
1972*: Pintwater-----	0-6	Gravelly fine sandy loam.	SM, GM	A-1, A-2	0-10	55-85	50-75	35-55	20-35	20-25	NP-5
	6-11	Extremely gravelly sandy loam, very gravelly fine sandy loam.	GM	A-1	0-15	35-50	20-40	15-35	10-20	20-25	NP-5
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1972*: Terlico-----	0-2	Very gravelly sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	2-11	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	11-18	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	18-60	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
1980*: Tert-----	0-3 3	Loam----- Unweathered bedrock.	CL, CL-ML ---	A-4, A-6 ---	0 ---	80-100 ---	75-100 ---	70-95 ---	50-65 ---	25-35 ---	5-15 ---
Whilphang-----	0-1	Very gravelly sandy loam.	SM, SM-SC, GM, GM-GC	A-1, A-2	0-5	50-65	30-50	20-35	10-20	20-30	NP-10
	1-11	Gravelly loam----	SM, SM-SC, GM, GM-GC	A-2, A-4	0-5	65-85	50-75	40-55	30-40	20-30	NP-10
	11	Weathered bedrock	---	---	---	---	---	---	---	---	---
Armespan-----	0-1	Very gravelly sandy loam.	GM	A-1	0-10	45-60	30-50	20-40	10-25	20-25	NP-5
	1-9	Sandy loam, gravelly sandy loam, gravelly loam.	SM	A-1, A-2	0-5	80-95	65-90	45-65	20-35	20-25	NP-5
	9-19	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-10	55-85	50-75	35-60	25-45	20-25	NP-5
	19-31	Very gravelly sandy loam, very gravelly coarse sandy loam.	GM	A-1	0-10	40-60	35-50	20-40	10-25	20-25	NP-5
	31-60	Very gravelly loamy coarse sand, very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	30-60	25-50	10-35	5-15	---	NP
1981*: Tert-----	0-3 3	Loam----- Unweathered bedrock.	CL, CL-ML ---	A-4, A-6 ---	0 ---	80-100 ---	75-100 ---	70-95 ---	50-65 ---	25-35 ---	5-15 ---
Whilphang-----	0-1	Sandy loam-----	SM, SM-SC	A-2	0	85-95	75-90	50-70	25-35	20-30	NP-10
	1-11	Gravelly loam----	SM, SM-SC, GM, GM-GC	A-2, A-4	0-5	65-85	50-75	40-55	30-40	20-30	NP-10
	11	Weathered bedrock	---	---	---	---	---	---	---	---	---
Geer-----	0-14	Fine sandy loam	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	14-60	Stratified fine sandy loam to silt loam.	ML, SM, SM-SC, CL-ML	A-4	0	100	100	85-95	45-75	15-30	NP-10

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1982*: Tert-----	0-3	Loam-----	CL, CL-ML	A-4, A-6	0	80-100	75-100	70-95	50-65	25-35	5-15
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Badland.											
1983*: Tert-----	0-3	Loam-----	CL, CL-ML	A-4, A-6	0	80-100	75-100	70-95	50-65	25-35	5-15
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Roic-----	0-2	Gravelly sandy loam.	GM, SM	A-1, A-2	0-5	60-80	50-75	35-55	15-30	---	NP
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
1990*: Whilphang-----	0-1	Very gravelly sandy loam.	SM, SM-SC, GM, GM-GC	A-1, A-2	0-5	50-65	30-50	20-35	10-20	20-30	NP-10
	1-11	Gravelly loam----	SM, SM-SC, GM, GM-GC	A-2, A-4	0-5	65-85	50-75	40-55	30-40	20-30	NP-10
	11	Weathered bedrock	---	---	---	---	---	---	---	---	---
Armespan-----	0-1	Very gravelly sandy loam.	GM	A-1	0-10	45-60	30-50	20-40	10-25	20-25	NP-5
	1-9	Sandy loam, gravelly sandy loam, gravelly loam.	SM	A-1, A-2	0-5	80-95	65-90	45-65	20-35	20-25	NP-5
	9-19	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-10	55-85	50-75	35-60	25-45	20-25	NP-5
	19-31	Very gravelly sandy loam, very gravelly coarse sandy loam.	GM	A-1	0-10	40-60	35-50	20-40	10-25	20-25	NP-5
	31-60	Very gravelly loamy coarse sand, very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	30-60	25-50	10-35	5-15	---	NP
2002*: Sodaspring-----	0-7	Loamy sand-----	SM	A-1	0-10	95-100	85-100	35-50	15-25	---	NP
	7-60	Stratified very gravelly coarse sand to sandy loam.	SM	A-1, A-2	0-10	75-95	50-75	30-55	15-25	15-25	NP-5
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2011----- Nuahs	0-4	Loamy sand-----	SM	A-1, A-2	0-10	85-100	75-100	45-70	15-25	---	NP
	4-18	Coarse sandy loam, sandy loam.	SM	A-2	0-10	90-100	75-90	45-60	25-35	20-25	NP-5
	18-60	Stratified fine sandy loam to very gravelly loamy coarse sand.	SM	A-1, A-2	0-15	80-90	50-75	40-50	15-30	15-25	NP-5
2020*: Armespan-----	0-1	Very gravelly sandy loam.	GM	A-1	0-10	45-60	30-50	20-40	10-25	20-25	NP-5
	1-9	Sandy loam, gravelly sandy loam, gravelly loam.	SM	A-1, A-2	0-5	80-95	65-90	45-65	20-35	20-25	NP-5
	9-19	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-10	55-85	50-75	35-60	25-45	20-25	NP-5
	19-31	Very gravelly sandy loam, very gravelly coarse sandy loam.	GM	A-1	0-10	40-60	35-50	20-40	10-25	20-25	NP-5
	31-60	Very gravelly loamy coarse sand, very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	30-60	25-50	10-35	5-15	---	NP
Whilphang-----	0-1	Very gravelly sandy loam.	SM, SM-SC, GM, GM-GC	A-1, A-2	0-5	50-65	30-50	20-35	10-20	20-30	NP-10
	1-11	Gravelly loam-----	SM, SM-SC, GM, GM-GC	A-2, A-4	0-5	65-85	50-75	40-55	30-40	20-30	NP-10
	11	Weathered bedrock	---	---	---	---	---	---	---	---	---
Wrango-----	0-4	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	4-10	Very gravelly sandy loam.	GM, SM, GM-GC, SM-SC	A-1, A-2	0-5	50-70	30-50	20-30	10-25	15-25	NP-10
	10-60	Stratified extremely gravelly sand to extremely gravelly loamy coarse sand.	GP, GP-GM	A-1	5-30	25-40	15-30	5-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2022*: Armespan-----	0-1	Very gravelly sandy loam.	GM	A-1	0-10	45-60	30-50	20-40	10-25	20-25	NP-5
	1-9	Sandy loam, gravelly sandy loam, gravelly loam.	SM	A-1, A-2	0-5	80-95	65-90	45-65	20-35	20-25	NP-5
	9-19	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-10	55-85	50-75	35-60	25-45	20-25	NP-5
	19-31	Very gravelly sandy loam, very gravelly coarse sandy loam.	GM	A-1	0-10	40-60	35-50	20-40	10-25	20-25	NP-5
	31-60	Very gravelly loamy coarse sand, very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	30-60	25-50	10-35	5-15	---	NP
Whilphang-----	0-1	Gravelly sandy loam.	SM, SM-SC	A-2	0-5	65-85	50-75	40-55	25-35	20-30	NP-10
	1-11	Gravelly loam----	SM, SM-SC, GM, GM-GC	A-2, A-4	0-5	65-85	50-75	40-55	30-40	20-30	NP-10
	11	Weathered bedrock	---	---	---	---	---	---	---	---	---
Geer-----	0-14	Fine sandy loam	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	14-60	Stratified fine sandy loam to silt loam.	ML, SM, SM-SC, CL-ML	A-4	0	100	100	85-95	45-75	15-30	NP-10
2023*: Armespan-----	0-1	Very gravelly sandy loam.	GM	A-1	0-10	45-60	30-50	20-40	10-25	20-25	NP-5
	1-9	Sandy loam, gravelly sandy loam, gravelly loam.	SM	A-1, A-2	0-5	80-95	65-90	45-65	20-35	20-25	NP-5
	9-19	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-10	55-85	50-75	35-60	25-45	20-25	NP-5
	19-31	Very gravelly sandy loam, very gravelly coarse sandy loam.	GM	A-1	0-10	40-60	35-50	20-40	10-25	20-25	NP-5
	31-60	Very gravelly loamy coarse sand, very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	30-60	25-50	10-35	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
2023*: Wrango-----	<u>In</u>										
	0-3	Gravelly loamy sand.	SM	A-1	0-5	60-80	55-75	15-40	10-25	---	NP
	3-10	Gravelly fine sandy loam.	SM, GM	A-2	0-5	60-80	55-75	35-55	25-35	---	NP
	10-60	Extremely gravelly loamy coarse sand, extremely gravelly sand, extremely gravelly loamy sand.	GP, GP-GM, GM	A-1	5-40	25-40	15-30	5-20	0-15	---	NP
2030*: Theriot-----	0-3	Very gravelly sandy loam.	GM, SM	A-1, A-2	15-35	40-70	40-60	25-50	10-30	---	NP
	3-14	Very stony loam, very cobbly loam, very gravelly sandy loam.	GM, SM	A-1, A-2, A-4	20-55	40-75	35-75	25-60	15-50	20-25	NP-5
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Theriot-----	0-3	Very gravelly sandy loam.	GM, SM	A-1, A-2	15-35	40-70	40-60	25-50	10-30	---	NP
	3-14	Very stony loam, very cobbly loam, very gravelly sandy loam.	GM, SM	A-1, A-2, A-4	20-55	40-75	35-75	25-60	15-50	20-25	NP-5
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
2031*: Theriot-----	0-3	Very gravelly sandy loam.	GM, SM	A-1, A-2	15-35	40-70	40-60	25-50	10-30	---	NP
	3-10	Very stony loam, very cobbly loam, very gravelly sandy loam.	GM, SM	A-1, A-2, A-4	20-55	40-75	35-75	25-60	15-50	20-25	NP-5
	10-14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Eaglepass-----	0-1	Very stony sandy loam.	GM	A-1	15-30	40-60	30-50	15-40	10-25	15-25	NP-5
	1-3	Extremely stony loam, very cobbly fine sandy loam, extremely gravelly sandy loam.	GM	A-1, A-2	25-45	30-65	25-60	20-50	10-35	15-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2032*: Theriot-----	0-3	Very gravelly sandy loam.	GM, SM	A-1, A-2	15-35	40-70	40-60	25-50	10-30	---	NP
	3-14	Very stony loam, very cobbly loam, very gravelly sandy loam.	GM, SM	A-1, A-2, A-4	20-55	40-75	35-75	25-60	15-50	20-25	NP-5
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
2080*: Roic-----	0-2	Very gravelly fine sandy loam.	GM	A-1, A-2	0-5	40-60	30-50	20-40	15-30	20-25	NP-5
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
Roic-----	0-2	Very gravelly fine sandy loam.	GM	A-1, A-2	0-5	40-60	30-50	20-40	15-30	20-25	NP-5
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
2081*: Roic-----	0-3	Loamy sand-----	SM	A-1, A-2	0	90-100	80-100	40-60	15-30	---	NP
	3-10	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	10	Weathered bedrock	---	---	---	---	---	---	---	---	---
Roic-----	0-2	Gravelly sandy loam.	GM, SM	A-1, A-2	0-5	60-80	50-75	35-55	15-30	---	NP
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
Badland.											
2082*: Roic-----	0-2	Gravelly sandy loam.	GM, SM	A-1, A-2	0-5	60-80	50-75	35-55	15-30	---	NP
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2082*: Koyen-----	0-4	Gravelly sandy loam.	SM	A-2, A-4	0	65-90	50-75	40-65	25-40	15-25	NP-5
	4-45	Stratified loam to gravelly loamy sand.	SM	A-2, A-4	0	80-90	75-85	50-60	25-40	15-25	NP-5
	45-60	Gravelly loamy sand, very gravelly loamy sand.	GP-GM, GM, SP-SM, SM	A-1	0	50-60	45-55	25-35	5-15	---	NP
2091*: Geer-----	0-10	Fine sandy loam	SM, ML	A-4	0	100	100	85-95	40-55	15-25	NP-5
	10-60	Stratified fine sandy loam to silt loam.	ML, SM, SM-SC, CL-ML	A-4	0	100	100	85-95	45-75	15-30	NP-10
Veet-----	0-3	Loamy sand-----	SM	A-2	0	95-100	85-100	70-85	15-30	---	NP
	3-17	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	17-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GM	A-1	10-25	45-55	30-50	15-30	10-20	---	NP
2092----- Geer	0-14	Fine sandy loam	SM, ML	A-4	0	100	100	85-95	40-55	15-25	NP-5
	14-60	Stratified fine sandy loam to silt loam.	ML, SM, SM-SC, CL-ML	A-4	0	100	100	85-95	45-75	15-30	NP-10
2100*: Rodad-----	0-4	Very channery loam.	GM, GM-GC	A-1, A-2	0-10	35-60	30-50	25-40	15-30	20-30	NP-10
	4-12	Very channery clay loam, very gravelly clay loam.	GC	A-2, A-6, A-7	0-15	35-65	30-55	25-50	20-45	35-45	15-25
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
Theriot-----	0-3	Very stony loam	GM, ML, SM	A-4	35-55	45-80	45-80	40-75	35-65	20-25	NP-5
	3-14	Very stony loam, very cobbly loam, very gravelly sandy loam.	GM, SM	A-1, A-2, A-4	20-55	40-75	35-75	25-60	15-50	20-25	NP-5
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Extremely cobbly loam.	GM, GM-GC	A-1, A-2	40-50	30-40	25-40	20-35	15-25	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
2101*: Rodad-----	0-3	Very channery loam.	GM, GM-GC	A-1, A-2	0-10	35-60	30-50	25-40	15-30	20-30	NP-10
	3-14	Very channery clay loam, very gravelly clay loam.	GC	A-2, A-6, A-7	0-15	35-65	30-55	25-50	20-45	35-45	15-25
	14	Weathered bedrock	---	---	---	---	---	---	---	---	---
Penelas-----	0-7	Very channery loam.	GM, GM-GC	A-1, A-2	0-5	30-55	25-50	20-40	15-35	20-30	NP-10
	7-12	Extremely shaly silty clay loam, extremely shaly clay loam.	GC, GP-GC	A-2	0-5	15-30	10-25	5-25	5-25	35-45	15-20
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
2110----- Bylo Variant	0-3	Very fine sandy loam.	SM, ML	A-4	0	100	100	85-95	45-60	20-25	NP-5
	3-60	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
2120*: Itme-----	0-6	Very gravelly sand.	SP-SM, SP	A-1	0-5	65-85	25-50	10-30	0-10	---	NP
	6-60	Very gravelly loamy sand, very gravelly sand.	SP-SM, SM, SP	A-1	0-25	65-85	25-50	10-30	0-15	---	NP
Truhoy-----	0-2	Very gravelly fine sandy loam.	SM, GM	A-1, A-2	0-10	45-65	30-50	25-40	10-30	20-25	NP-5
	2-11	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-5	60-85	50-75	40-55	25-40	20-25	NP-5
	11-17	Cemented-----	---	---	---	---	---	---	---	---	---
	17-60	Stratified very gravelly loamy sand to extremely gravelly coarse sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-65	20-45	15-30	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3000*: Perazzo-----	0-4	Very gravelly sandy loam.	GM	A-1	0-10	40-60	35-50	25-35	10-20	20-30	NP-5
	4-13	Very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-5	40-60	35-50	30-40	20-35	30-40	10-15
	13-21	Extremely gravelly sandy loam, extremely gravelly loam.	GP-GM, GM	A-1	0-5	20-30	15-25	10-20	5-15	---	NP
	21-60	Extremely gravelly sand, extremely gravelly loamy sand.	GP-GM, GP	A-1	0-5	20-30	15-25	10-20	0-10	---	NP
Typic Torriorthents--	0-6	Very gravelly sandy loam.	GM	A-1	0-10	45-60	35-55	20-35	10-20	15-20	NP-5
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
3001*: Perazzo-----	0-4	Very gravelly sandy loam.	GM	A-1	0-10	40-60	35-50	25-35	10-20	20-30	NP-5
	4-13	Very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-5	40-60	35-50	30-40	20-35	30-40	10-15
	13-21	Extremely gravelly sandy loam, extremely gravelly loam.	GP-GM, GM	A-1	0-5	20-30	15-25	10-20	5-15	---	NP
	21-60	Extremely gravelly sand, extremely gravelly loamy sand.	GP-GM, GP	A-1	0-5	20-30	15-25	10-20	0-10	---	NP
Rawe-----	0-1	Gravelly sandy loam.	SM	A-1, A-2	0	70-90	60-75	45-60	20-35	15-25	NP-5
	1-10	Gravelly clay, clay.	SC, CL	A-7	0	75-95	60-90	40-65	35-60	40-50	15-25
	10-60	Stratified very gravelly sandy loam to extremely gravelly coarse sandy loam.	GP, GP-GM, GM	A-1	0	45-60	10-50	5-35	0-20	---	NP
Bluewing-----	0-7	Very gravelly loamy sand.	SP-SM	A-1	10-25	70-85	35-45	15-30	5-10	---	NP
	7-60	Stratified very gravelly sand to extremely gravelly loamy coarse sand.	GP-GM, GP	A-1	0-25	40-50	20-35	10-15	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3002*: Perazzo-----	0-4	Very gravelly sandy loam.	GM	A-1	0-10	40-60	35-50	25-35	10-20	20-30	NP-5
	4-13	Very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-5	40-60	35-50	30-40	20-35	30-40	10-15
	13-21	Extremely gravelly sandy loam, extremely gravelly loam.	GP-GM, GM	A-1	0-5	20-30	15-25	10-20	5-15	---	NP
	21-60	Extremely gravelly sand, extremely gravelly loamy sand.	GP-GM, GP	A-1	0-5	20-30	15-25	10-20	0-10	---	NP
Veet-----	0-5	Very gravelly sandy loam.	SM	A-1	0-10	60-75	30-50	20-45	15-25	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP
Rawe-----	0-1	Gravelly sandy loam.	SM	A-1, A-2	0	70-90	60-75	45-60	20-35	15-25	NP-5
	1-10	Gravelly clay, clay.	SC, CL	A-7	0	75-95	60-90	40-65	35-60	40-50	15-25
	10-60	Stratified very gravelly sandy loam to extremely gravelly coarse sandy loam.	GP, GP-GM, GM	A-1	0	45-60	10-50	5-35	0-20	---	NP
3003*: Perazzo-----	0-4	Very gravelly sandy loam.	GM	A-1	0-10	40-60	35-50	25-35	10-20	20-30	NP-5
	4-13	Very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-5	40-60	35-50	30-40	20-35	30-40	10-15
	13-21	Extremely gravelly sandy loam, extremely gravelly loam.	GP-GM, GM	A-1	0-5	20-30	15-25	10-20	5-15	---	NP
	21-60	Extremely gravelly sand, extremely gravelly loamy sand.	GP-GM, GP	A-1	0-5	20-30	15-25	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3003*: Bluewing-----	0-7	Very gravelly loamy sand.	SP-SM	A-1	10-25	70-85	35-45	15-30	5-10	---	NP
	7-60	Stratified very gravelly sand to extremely gravelly loamy coarse sand.	GP-GM, GP	A-1	0-25	40-50	20-35	10-15	0-10	---	NP
3020*: Rawe-----	0-4	Gravelly sandy loam.	SM	A-1, A-2	0	70-90	60-75	45-60	20-35	15-25	NP-5
	4-11	Gravelly clay, clay.	SC, CL	A-7	0	75-95	60-90	40-65	35-60	40-50	15-25
	11-60	Stratified very gravelly sandy loam to extremely gravelly coarse sandy loam.	GP, GP-GM, GM	A-1	0	45-60	10-50	5-35	0-20	---	NP
Bluewing-----	0-7	Very gravelly loamy sand.	GP-GM	A-1	5-15	30-40	25-35	15-25	5-10	---	NP
	7-60	Stratified very gravelly coarse sand to extremely gravelly loamy sand.	GP-GM	A-1	15-25	30-40	25-35	15-25	5-10	---	NP
Trocken-----	0-3	Very gravelly sandy loam.	GM, SM	A-1	0-10	45-65	35-50	25-40	10-20	20-25	NP-5
	3-60	Stratified gravelly loam to extremely gravelly loamy coarse sand.	GM, SM	A-1	0-15	35-70	20-50	15-40	10-20	20-25	NP-5
3040*: Deefan-----	0-3	Very gravelly fine sandy loam.	GM-GC	A-2	0-15	30-60	25-50	20-40	10-20	20-25	5-10
	3-10	Gravelly clay----	GC, CL, CH	A-7	0-10	55-85	50-75	45-65	40-60	45-60	20-30
	10-26	Cemented-----	---	---	---	---	---	---	---	---	---
	26-60	Stratified extremely gravelly coarse sand to extremely gravelly sandy loam.	GP, GP-GM	A-1	0-25	20-45	15-25	10-20	0-10	---	NP
Rawe-----	0-1	Gravelly sandy loam.	SM	A-1, A-2	0	70-90	60-75	45-60	20-35	15-25	NP-5
	1-10	Gravelly clay, clay.	SC, CL	A-7	0	75-95	60-90	40-65	35-60	40-50	15-25
	10-60	Stratified very gravelly sandy loam to extremely gravelly coarse sandy loam.	GP, GP-GM, GM	A-1	0	45-60	10-50	5-35	0-20	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
3040*: Bluewing-----	0-7	Very gravelly loamy sand.	SP-SM	A-1	10-25	70-85	35-45	15-30	5-10	---	NP
	7-60	Stratified very gravelly sand to extremely gravelly loamy coarse sand.	GP-GM, GP	A-1	0-25	40-50	20-35	10-15	0-10	---	NP
3042*: Deefan-----	0-3	Very gravelly fine sandy loam.	GM-GC	A-2	0-15	30-60	25-50	20-40	10-20	20-25	5-10
	3-10	Gravelly clay----	GC, CL, CH	A-7	0-10	55-85	50-75	45-65	40-60	45-60	20-30
	10-26	Cemented-----	----	----	----	----	----	----	----	----	----
	26-60	Stratified extremely gravelly coarse sand to extremely gravelly sandy loam.	GP, GP-GM	A-1	0-25	20-45	15-25	10-20	0-10	---	NP
Perazzo-----	0-6	Very gravelly sandy loam.	GM	A-1	0-10	40-60	35-50	25-35	10-20	20-30	NP-5
	6-15	Very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-5	40-60	35-50	30-40	20-35	30-40	10-15
	15-20	Extremely gravelly sandy loam, extremely gravelly loam.	GP-GM, GM	A-1	0-5	20-30	15-25	10-20	5-15	---	NP
	20-60	Extremely gravelly sand, extremely gravelly loamy sand.	GP-GM, GP	A-1	0-5	20-30	15-25	10-20	0-10	---	NP
3043*: Deefan-----	0-3	Very gravelly fine sandy loam.	GM-GC	A-2	0-15	30-60	25-50	20-40	10-20	20-25	5-10
	3-10	Gravelly clay----	GC, CL, CH	A-7	0-10	55-85	50-75	45-65	40-60	45-60	20-30
	10-26	Cemented-----	----	----	----	----	----	----	----	----	----
	26-60	Stratified extremely gravelly coarse sand to extremely gravelly sandy loam.	GP, GP-GM	A-1	0-25	20-45	15-25	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3043*: Cleaver-----	0-2	Very gravelly sandy loam.	GM	A-1	0-10	35-50	25-40	20-30	10-20	---	NP
	2-11	Gravelly clay loam, gravelly loam.	SC, CL	A-6, A-7	0-5	75-85	50-75	45-70	40-60	35-50	15-25
	11-23 23-60	Indurated----- Stratified very gravelly sandy loam to extremely gravelly coarse sand.	--- GP, GP-GM	--- A-1	--- 10-25	--- 15-30	--- 10-25	--- 5-15	--- 0-10	--- ---	--- NP
Bluewing-----	0-7	Very gravelly loamy sand.	SP-SM	A-1	10-25	70-85	35-45	15-30	5-10	---	NP
	7-60	Stratified very gravelly sand to extremely gravelly loamy coarse sand.	GP-GM, GP	A-1	0-25	40-50	20-35	10-15	0-10	---	NP
3052*: Veet-----	0-3	Gravelly loamy sand.	SM	A-1, A-2	0-5	65-80	60-75	30-55	10-25	---	NP
	3-17	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	17-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GM	A-1	10-25	45-55	30-50	15-30	10-20	---	NP
Itme-----	0-6	Very gravelly sand.	SP-SM, SP	A-1	0-5	65-85	25-50	10-30	0-10	---	NP
	6-60	Very gravelly loamy sand, very gravelly sand.	SP-SM, SM, SP	A-1	0-25	65-85	25-50	10-30	0-15	---	NP
3054----- Veet	0-5	Gravelly sandy loam.	SM	A-2	0-10	75-90	50-75	40-60	25-35	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3060*: Smedley-----	0-2	Very gravelly sandy loam.	SM, GM	A-1	0-15	50-75	35-50	25-45	15-25	---	NP
	2-18	Gravelly clay loam, gravelly clay, cobbly clay loam.	CL	A-7	5-15	70-85	65-80	60-75	55-70	40-50	15-25
	18-43	Cemented-----	---	---	---	---	---	---	---	---	---
	43-60	Stratified extremely gravelly sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	15-30	30-45	20-35	15-25	5-15	---	NP
Silverbow-----	0-3	Very cobbly fine sandy loam.	GM	A-2, A-4	25-55	55-70	50-65	40-55	25-40	20-25	NP-5
	3-14	Very stony clay loam, very cobbly clay loam, extremely cobbly sandy clay loam.	GC	A-2, A-6	35-45	35-55	30-50	25-50	15-40	25-40	10-20
	14-42	Indurated-----	---	---	---	---	---	---	---	---	---
	42-60	Cemented-----	---	---	---	---	---	---	---	---	---
Annaw-----	0-2	Very gravelly loamy sand.	GM, SM	A-1	0-25	40-60	35-50	25-35	10-15	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
3061*: Smedley-----	0-2	Very gravelly sandy loam.	SM, GM	A-1	0-15	50-75	35-50	25-45	15-25	---	NP
	2-15	Gravelly clay loam, gravelly clay, cobbly clay loam.	CL	A-7	5-15	70-85	65-80	60-75	55-70	40-50	15-25
	15-33	Cemented-----	---	---	---	---	---	---	---	---	---
	33-60	Stratified extremely gravelly sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	15-30	30-45	20-35	15-25	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3061*: Annaw-----	0-2	Very gravelly loamy sand.	GM, SM	A-1	0-25	40-60	35-50	25-35	10-15	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
3063----- Smedley	0-2	Very gravelly sandy loam.	SM, GM	A-1	0-15	50-75	35-50	25-45	15-25	---	NP
	2-18	Gravelly clay loam, gravelly clay, cobbly clay loam.	CL	A-7	5-15	70-85	65-80	60-75	55-70	40-50	15-25
	18-43 43-60	Cemented----- Stratified extremely gravelly sand to extremely gravelly sandy loam.	--- GP-GM, GM	--- A-1	--- 15-30	--- 30-45	--- 20-35	--- 15-25	--- 5-15	--- ---	--- NP
3070*: Silverbow-----	0-2	Extremely stony very fine sandy loam.	GM	A-1, A-2	25-45	40-55	35-50	30-50	20-35	20-25	NP-5
	2-13	Very stony clay loam, extremely cobbly sandy clay loam, very cobbly clay loam.	GC	A-2, A-6	30-45	35-55	30-50	25-50	15-40	25-40	10-20
	13-16 16-40	Indurated----- Cemented-----	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Rubble land.											

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3070*: Smedley-----	0-2	Stony sandy loam	SM	A-1, A-2	10-25	65-80	60-75	35-50	20-30	---	NP
	2-18	Gravelly clay loam, gravelly clay, cobbly clay loam.	CL	A-7	5-15	70-85	65-80	60-75	55-70	40-50	15-25
	18-43	Cemented-----	---	---	---	---	---	---	---	---	---
	43-60	Stratified extremely gravelly sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	15-30	30-45	20-35	15-25	5-15	---	NP
3090*: Inmo-----	0-8	Very gravelly loamy sand.	SM	A-1	0-5	65-75	30-50	20-30	10-20	---	NP
	8-40	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	SP, SP-SM	A-1	0-5	75-85	20-35	10-25	0-10	---	NP
	40-60	Very gravelly loamy coarse sand.	SM	A-1	0-5	80-90	40-55	25-40	10-15	---	NP
Inmo-----	0-8	Very gravelly loamy sand.	SM	A-1	0-5	65-75	30-50	20-30	10-15	---	NP
	8-40	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	SP, SP-SM	A-1	0-5	60-85	20-35	10-25	0-10	---	NP
	40-60	Very gravelly loamy coarse sand.	SM	A-1	0-5	80-90	40-55	25-40	10-15	---	NP
3091*: Inmo-----	0-2	Extremely stony sandy loam.	SM	A-1	30-50	55-75	25-40	15-25	5-15	---	NP-5
	2-37	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	SP, SP-SM	A-1	0-5	75-85	20-35	10-25	0-10	---	NP
	37-60	Very gravelly loamy coarse sand.	SM	A-1	0-15	80-90	35-50	20-30	10-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3091*: Rednik-----	0-6	Very gravelly sandy loam.	GM	A-1	0-5	45-55	35-50	25-40	15-25	---	NP
	6-20	Very gravelly sandy loam, extremely gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	35-60	30-50	20-35	15-30	25-35	10-15
	20-45	Very gravelly sandy loam, very gravelly fine sandy loam.	GM	A-1	5-30	35-60	30-50	15-40	10-25	---	NP
	45-65	Very gravelly sand, extremely gravelly loamy sand.	GP, GP-GM, SP-SM, GM	A-1	5-30	30-60	25-60	15-30	0-15	---	NP
3092*: Inmo-----	0-6	Sand-----	SM, SP-SM	A-2, A-3	0	90-100	80-100	55-70	5-15	---	NP
	6-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	SP, SP-SM	A-1	0-5	75-85	20-35	10-25	0-10	---	NP
Nuahs-----	0-4	Gravelly loamy sand.	SM	A-1	0-10	70-95	50-75	25-50	15-25	---	NP
	4-18	Coarse sandy loam, sandy loam.	SM	A-2	0-10	90-100	75-90	45-60	25-35	20-25	NP-5
	18-60	Stratified fine sandy loam to very gravelly loamy coarse sand.	SM	A-1, A-2	0-15	80-90	50-75	40-50	15-30	15-25	NP-5
Luning-----	0-6	Gravelly loamy sand.	SM	A-1	0-10	60-75	55-70	30-50	10-20	---	NP
	6-35	Loamy fine sand, fine sand.	SM	A-2	0	90-100	75-100	55-80	10-30	---	NP
	35-60	Stratified very gravelly sand to gravelly loamy fine sand.	GP, SP	A-1	0-10	35-60	25-45	10-30	0-5	---	NP
3095*: Inmo-----	0-8	Very gravelly loamy sand.	SM	A-1	0-5	65-75	30-50	20-30	10-15	---	NP
	8-40	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	SP, SP-SM	A-1	0-5	60-85	20-35	10-25	0-10	---	NP
	40-60	Very gravelly loamy coarse sand.	SM	A-1	0-5	80-90	40-55	25-40	10-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3095*: Stumble-----	0-12	Loamy sand-----	SM	A-2	0-5	85-100	85-100	75-90	15-25	---	NP
	12-18	Loamy sand, loamy fine sand.	SM	A-2	0-5	85-100	85-100	55-75	15-25	---	NP
	18-60	Gravelly loamy sand, gravelly loamy fine sand.	SM	A-1, A-2	0-10	75-85	50-70	40-60	15-25	---	NP
3110*: Fulstone-----	0-5	Cobbly loam-----	GM-GC, SM-SC, GM, SM	A-4	15-30	65-80	65-75	50-60	35-50	20-30	NP-10
	5-18	Clay-----	CH, MH	A-7	0-5	95-100	90-100	85-100	70-85	50-65	20-35
	18-30	Indurated-----	---	---	---	---	---	---	---	---	---
	30-60	Very cobbly sandy loam, extremely cobbly sandy loam, extremely gravelly sand.	GP-GM, GM, GP	A-1	30-45	25-55	20-50	10-35	0-20	15-25	NP-5
Wedlar-----	0-6	Loamy sand-----	SM	A-1, A-2	0-5	90-100	85-100	40-70	15-30	---	NP
	6-14	Loam-----	CL-ML	A-4	0-5	90-100	85-100	75-90	50-75	25-30	5-10
	14-37	Sandy clay loam, sandy clay.	SC	A-2, A-6, A-7	0-5	85-95	75-90	60-75	30-50	35-45	15-20
	37-60	Gravelly sandy loam, gravelly loamy sand.	SM, SM-SC, GM, GM-GC	A-1, A-2, A-4	0-10	55-80	50-75	35-60	15-40	15-30	NP-10
Veet-----	0-5	Very gravelly sandy loam.	SM	A-1	0-10	60-75	30-50	20-45	15-25	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP
3111*: Fulstone-----	0-4	Cobbly loam-----	GM-GC, SM-SC, GM, SM	A-4	15-30	65-80	65-75	50-60	35-50	20-30	NP-10
	4-15	Clay-----	CH, MH	A-7	0-5	95-100	90-100	85-100	70-85	50-65	20-35
	15-40	Indurated-----	---	---	---	---	---	---	---	---	---
	40-60	Very cobbly sandy loam, extremely cobbly sandy loam, extremely gravelly sand.	GP-GM, GM, GP	A-1	30-45	25-55	20-50	10-35	0-20	15-25	NP-5

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
3111*: Mickey-----	<u>In</u>										
	0-5	Gravelly loamy sand.	SM	A-1	0-10	65-95	50-75	30-50	10-25	---	NP
	5-10	Gravelly sandy clay loam, gravelly loam.	SC	A-2, A-6	0-10	65-95	50-75	35-50	25-50	25-35	10-15
	10-15	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay.	SC, CL, GC	A-6, A-7	0-10	65-100	50-75	40-70	35-55	35-45	15-25
	15-37	Cemented-----	---	---	---	---	---	---	---	---	---
	37-60	Stratified gravelly loamy coarse sand to extremely gravelly sandy loam.	SM, GM	A-1	0-25	40-70	25-50	15-30	10-15	15-25	NP-5
3120*: Wassit-----	0-6	Very gravelly sandy loam.	GM	A-1, A-2	0-10	45-65	35-50	25-40	15-30	20-25	NP-5
	6-12	Very gravelly loam, very gravelly clay loam.	GC	A-2	0-10	45-65	30-50	25-40	20-35	30-45	10-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Brawley-----	0-7	Very stony fine sandy loam.	SM, GM	A-2, A-4	15-30	60-85	50-75	40-60	25-40	30-35	NP-5
	7-27	Very gravelly clay, very gravelly clay loam.	GC, GM	A-2	0-10	45-65	30-50	25-40	25-35	40-55	15-25
	27	Weathered bedrock	---	---	---	---	---	---	---	---	---
3123----- Wassit	0-6	Very stony sandy loam.	GM	A-1, A-2	25-45	50-65	35-55	25-40	15-30	20-25	NP-5
	6-12	Very gravelly loam, very gravelly clay loam.	GC	A-2	0-10	45-65	30-50	25-40	20-35	30-45	10-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
3124*: Wassit-----	0-6	Very gravelly sandy loam.	GM	A-1, A-2	0-10	45-65	35-50	25-40	15-30	20-25	NP-5
	6-12	Very gravelly loam, very gravelly clay loam.	GC	A-2	0-10	45-65	30-50	25-40	20-35	30-45	10-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3124*: Loomer-----	0-7	Very gravelly sandy loam.	GM	A-1, A-2	10-25	45-65	35-55	25-45	20-35	20-25	NP-5
	7-17	Extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam.	GC	A-2	30-55	30-45	20-35	15-30	15-25	40-55	20-35
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
3130*: Mickey-----	0-5	Very gravelly sandy loam.	SM, GM	A-1	0-15	40-70	25-50	20-35	10-20	20-25	NP-5
	5-10	Gravelly sandy clay loam, gravelly loam.	SC	A-2, A-6	0-10	65-95	50-75	35-50	25-50	25-35	10-15
	10-15	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay.	SC, CL, GC	A-6, A-7	0-10	65-100	50-75	40-70	35-55	35-45	15-25
	15-37	Cemented-----	---	---	---	---	---	---	---	---	---
	37-60	Stratified gravelly loamy coarse sand to extremely gravelly sandy loam.	SM, GM	A-1	0-25	40-70	25-50	15-30	10-15	15-25	NP-5
Smedley-----	0-2	Very gravelly sandy loam.	SM, GM	A-1	0-15	50-75	35-50	25-45	15-25	---	NP
	2-18	Gravelly clay loam, gravelly clay, cobbly clay loam.	CL	A-7	5-15	70-85	65-80	60-75	55-70	40-50	15-25
	18-43	Cemented-----	---	---	---	---	---	---	---	---	---
	43-60	Stratified extremely gravelly sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	15-30	30-45	20-35	15-25	5-15	---	NP
Veet-----	0-5	Very gravelly sandy loam.	SM	A-1	0-10	60-75	30-50	20-45	15-25	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3131*: Mickey-----	0-5	Gravelly loamy sand.	SM	A-1	0-10	65-95	50-75	30-50	10-25	---	NP
	5-10	Gravelly sandy clay loam, gravelly loam.	SC	A-2, A-6	0-10	65-95	50-75	35-50	25-50	25-35	10-15
	10-15	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay.	SC, CL, GC	A-6, A-7	0-10	65-100	50-75	40-70	35-55	35-45	15-25
	15-37	Cemented-----	---	---	---	---	---	---	---	---	---
	37-60	Stratified gravelly loamy coarse sand to extremely gravelly sandy loam.	SM, GM	A-1	0-25	40-70	25-50	15-30	10-15	15-25	NP-5
Veet-----	0-5	Very gravelly sandy loam.	SM	A-1	0-10	60-75	30-50	20-45	15-25	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP
3133----- Mickey	0-5	Very gravelly sandy loam.	SM, GM	A-1	0-15	40-70	25-50	20-35	10-20	20-25	NP-5
	5-10	Gravelly sandy clay loam, gravelly loam.	SC	A-2, A-6	0-10	65-95	50-75	35-50	25-50	25-35	10-15
	10-15	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay.	SC, CL, GC	A-6, A-7	0-10	65-100	50-75	40-70	35-55	35-45	15-25
	15-37	Cemented-----	---	---	---	---	---	---	---	---	---
	37-60	Stratified gravelly loamy coarse sand to extremely gravelly sandy loam.	SM, GM	A-1	0-25	40-70	25-50	15-30	10-15	15-25	NP-5
3140*: Loomer-----	0-2	Very stony sandy loam.	GM	A-1, A-2	25-45	50-65	35-55	25-40	15-30	20-25	NP-5
	2-19	Extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam.	GC	A-2	30-55	30-45	20-35	15-30	15-25	40-55	20-35
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3140*: Rowel-----	0-6	Very cobbly sandy loam.	GM	A-1	35-50	35-50	25-40	15-30	10-20	15-25	NP-5
	6-13	Very cobbly clay, extremely cobbly clay.	GC, GM	A-2	50-65	40-55	30-45	25-45	20-35	45-65	20-30
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Downeyville----	0-4	Very cobbly fine sandy loam.	SM-SC, SM	A-2, A-1	30-50	70-85	45-65	35-50	15-35	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
3141*: Loomer-----	0-2	Very stony sandy loam.	GM	A-1, A-2	25-45	50-65	35-55	25-40	15-30	20-25	NP-5
	2-19	Extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam.	GC	A-2	30-55	30-45	20-35	15-30	15-25	40-55	20-35
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rowel-----	0-6	Very stony sandy loam.	GM	A-1	35-50	35-50	25-40	15-30	10-20	15-25	NP-5
	6-14	Very cobbly clay, extremely cobbly clay.	GC, GM	A-2	50-65	40-55	30-45	25-45	20-35	45-65	20-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Wassit-----	0-6	Very stony sandy loam.	GM	A-1, A-2	25-45	50-65	35-55	25-40	15-30	20-25	NP-5
	6-12	Very gravelly loam, very gravelly clay loam.	GC	A-2	0-10	45-65	30-50	25-40	20-35	30-45	10-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
3142*: Loomer-----	0-2	Very stony sandy loam.	GM	A-1, A-2	25-45	50-65	35-55	25-40	15-30	20-25	NP-5
	2-19	Extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam.	GC	A-2	30-55	30-45	20-35	15-30	15-25	40-55	20-35
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3142*: Downeyville-----	0-4	Very stony fine sandy loam.	SM-SC, SM	A-2, A-1	30-50	70-85	45-65	35-50	15-35	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
3143*: Loomer-----	0-2	Very stony sandy loam.	GM	A-1, A-2	25-45	50-65	35-55	25-40	15-30	20-25	NP-5
	2-19	Extremely cobbly clay, extremely gravelly clay, extremely cobbly clay loam.	GC	A-2	30-55	30-45	20-35	15-30	15-25	40-55	20-35
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rowel-----	0-6	Very stony sandy loam.	GM	A-1	35-50	35-50	25-40	15-30	10-20	15-25	NP-5
	6-14	Very cobbly clay, extremely cobbly clay.	GC, GM	A-2	50-65	40-55	30-45	25-45	20-35	45-65	20-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rubble land.											
3150----- Zyzzi	0-4	Very gravelly sandy loam.	SM	A-1	0-5	75-90	35-50	20-35	10-20	---	NP
	4-8	Extremely gravelly sandy clay loam, very gravelly sandy clay loam.	SC	A-2	0-5	60-75	20-35	15-30	10-20	35-40	15-20
	8	Weathered bedrock	---	---	---	---	---	---	---	---	---
3151*: Zyzzi-----	0-2	Very gravelly sandy loam.	SM	A-1	0-5	75-90	35-50	20-35	10-20	---	NP
	2-6	Extremely gravelly sandy clay loam, very gravelly sandy clay loam.	SC	A-2	0-5	60-75	20-35	15-30	10-20	35-40	15-20
	6-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
Nupart-----	0-2	Very gravelly loamy sand.	SM	A-1	0-15	75-85	30-50	15-25	10-15	---	NP
	2-5	Very gravelly loamy coarse sand.	SP-SM, SM	A-1	0-10	70-85	25-50	10-25	5-15	---	NP
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3170*: Ravenell-----	0-5	Very gravelly loam.	GM-GC	A-2	15-25	40-60	35-55	30-45	20-35	25-30	5-10
	5-12	Very gravelly clay, very gravelly sandy clay.	GC	A-7, A-2	15-25	40-60	35-55	30-50	20-45	40-50	15-20
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
Haar-----	0-2	Gravelly loam----	SM-SC, CL-ML, GM-GC	A-4	0-5	60-80	55-75	50-60	40-55	20-30	5-10
	2-6	Silt loam, loam	CL-ML	A-4	0	95-100	90-100	80-95	70-85	20-30	5-10
	6	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
3191*: Wellsed-----	0-6	Gravelly fine sand.	SM	A-1, A-2	0-5	80-95	50-75	40-65	15-30	---	NP
	6-15	Gravelly sandy clay loam.	SC	A-2, A-6	0-5	80-95	50-75	35-60	25-40	30-40	10-20
	15-35	Gravelly loamy sand, loamy sand.	SM	A-1	0-5	80-95	50-90	30-50	10-20	---	NP
	35-50	Indurated-----	---	---	---	---	---	---	---	---	---
	50-60	Stratified loamy coarse sand to gravelly sandy loam.	SM	A-1, A-2	0-5	85-95	60-90	30-55	15-25	---	NP
Mickey-----	0-5	Very gravelly sandy loam.	SM, GM	A-1	0-15	40-70	25-50	20-35	10-20	20-25	NP-5
	5-10	Gravelly sandy clay loam, gravelly loam.	SC	A-2, A-6	0-10	65-95	50-75	35-50	25-50	25-35	10-15
	10-15	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay.	SC, CL, GC	A-6, A-7	0-10	65-100	50-75	40-70	35-55	35-45	15-25
	15-37	Cemented-----	---	---	---	---	---	---	---	---	---
	37-60	Stratified gravelly loamy coarse sand to extremely gravelly sandy loam.	SM, GM	A-1	0-25	40-70	25-50	15-30	10-15	15-25	NP-5
Veet-----	0-5	Very gravelly sandy loam.	SM	A-1	0-10	60-75	30-50	20-45	15-25	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
3192*: Wellsted-----	0-6	Gravelly fine sand.	SM	A-1, A-2	0-5	80-95	50-75	40-65	15-30	---	NP
	6-15	Gravelly sandy clay loam.	SC	A-2, A-6	0-5	80-95	50-75	35-60	25-40	30-40	10-20
	15-35	Gravelly loamy sand, loamy sand.	SM	A-1	0-5	80-95	50-90	30-50	10-20	---	NP
	35-50	Indurated-----	---	---	---	---	---	---	---	---	---
	50-60	Stratified loamy coarse sand to gravelly sandy loam.	SM	A-1, A-2	0-5	85-95	60-90	30-55	15-25	---	NP
Ravenell-----	0-3	Very gravelly loam.	GM-GC	A-2	15-25	40-60	35-55	30-45	20-35	25-30	5-10
	3-7	Very gravelly clay, very gravelly sandy clay.	GC	A-7, A-2	15-25	40-60	35-55	30-50	20-45	40-50	15-20
	7	Weathered bedrock	---	---	---	---	---	---	---	---	---
Haar-----	0-2	Gravelly loam-----	SM-SC, CL-ML, GM-GC	A-4	0-5	60-80	55-75	50-60	40-55	20-30	5-10
	2-6	Silt loam, loam	CL-ML	A-4	0	95-100	90-100	80-95	70-85	20-30	5-10
	6	Weathered bedrock	---	---	---	---	---	---	---	---	---
3193*: Wellsted-----	0-7	Gravelly fine sand.	SM	A-1, A-2	0-5	80-95	50-75	40-65	15-30	---	NP
	7-17	Gravelly sandy clay loam.	SC	A-2, A-6	0-5	80-95	50-75	35-60	25-40	30-40	10-20
	17-25	Gravelly loamy sand, loamy sand.	SM	A-1	0-5	80-95	50-90	30-50	10-20	---	NP
	25-45	Indurated-----	---	---	---	---	---	---	---	---	---
	45-60	Stratified loamy coarse sand to gravelly sandy loam.	SM	A-1, A-2	0-5	85-95	60-90	30-55	15-25	---	NP
Wedlar-----	0-8	Loamy sand-----	SM	A-1, A-2	0-5	90-100	85-100	40-70	15-30	---	NP
	8-11	Loam-----	CL-ML	A-4	0-5	90-100	85-100	75-90	50-75	25-30	5-10
	11-31	Sandy clay loam, sandy clay.	SC	A-2, A-6, A-7	0-5	85-95	75-90	60-75	30-50	35-45	15-20
	31-60	Gravelly sandy loam, gravelly loamy sand.	SM, SM-SC, GM, GM-GC	A-1, A-2, A-4	0-10	55-80	50-75	35-60	15-40	15-30	NP-10

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3194*: Wellsted-----	0-6	Gravelly fine sand.	SM	A-1, A-2	0-5	80-95	50-75	40-65	15-30	---	NP
	6-15	Gravelly sandy clay loam.	SC	A-2, A-6	0-5	80-95	50-75	35-60	25-40	30-40	10-20
	15-35	Gravelly loamy sand, loamy sand.	SM	A-1	0-5	80-95	50-90	30-50	10-20	---	NP
	35-50	Indurated-----	---	---	---	---	---	---	---	---	---
	50-60	Stratified loamy coarse sand to gravelly sandy loam.	SM	A-1, A-2	0-5	85-95	60-90	30-55	15-25	---	NP
Smedley-----	0-2	Very gravelly sandy loam.	SM, GM	A-1	0-15	50-75	35-50	25-45	15-25	---	NP
	2-18	Gravelly clay loam, gravelly clay, cobbly clay loam.	CL	A-7	5-15	70-85	65-80	60-75	55-70	40-50	15-25
	18-43	Cemented-----	---	---	---	---	---	---	---	---	---
	43-60	Stratified extremely gravelly sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	15-30	30-45	20-35	15-25	5-15	---	NP
Mickey-----	0-5	Gravelly loamy sand.	SM	A-1	0-10	65-95	50-75	30-50	10-25	---	NP
	5-10	Gravelly sandy clay loam, gravelly loam.	SC	A-2, A-6	0-10	65-95	50-75	35-50	25-50	25-35	10-15
	10-15	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy clay.	SC, CL, GC	A-6, A-7	0-10	65-100	50-75	40-70	35-55	35-45	15-25
	15-37	Cemented-----	---	---	---	---	---	---	---	---	---
	37-60	Stratified gravelly loamy coarse sand to extremely gravelly sandy loam.	SM, GM	A-1	0-25	40-70	25-50	15-30	10-15	15-25	NP-5
3210*: Fallon-----	0-8	Fine sandy loam	SM	A-4, A-2	0	100	100	60-80	25-40	---	NP
	8-60	Stratified sand to silt loam.	SM, ML	A-4	0	95-100	85-100	70-90	40-60	---	NP
Fettic Variant--	0-8	Fine sandy loam	ML	A-4	0	100	95-100	70-90	50-70	20-25	NP-5
	8-20	Clay loam, loam	CL	A-6	0	100	100	85-100	70-80	35-40	15-20
	20-60	Stratified loamy sand to clay loam.	ML, SM	A-4	0	100	95-100	65-85	45-70	20-25	NP-5
Fallon-----	0-10	Fine sandy loam	SM	A-4	0	100	100	65-80	35-50	15-25	NP-5
	10-60	Stratified sand to silt loam.	SM, ML	A-4	0	95-100	85-100	70-90	40-60	15-25	NP-5

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3212*: Fallon-----	0-14	Sand-----	SM, SP-SM	A-3, A-2	0	100	100	50-70	5-15	---	NP
	14-60	Stratified sand to silt loam.	SM, ML	A-4	0	95-100	85-100	70-90	40-60	---	NP
Slaw-----	0-9	Silt loam-----	ML, CL-ML	A-4	0	100	100	95-100	80-90	25-35	5-10
	9-40	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-95	25-40	5-20
	40-60	Stratified loamy fine sand to silt loam.	SM	A-4	0	100	100	80-90	35-50	20-25	NP-5
3220----- Rowel	0-6	Very cobbly sandy loam.	GM	A-1	35-50	35-50	25-40	15-30	10-20	15-25	NP-5
	6-14	Very cobbly clay, extremely cobbly clay.	GC, GM	A-2	50-65	40-55	30-45	25-45	20-35	45-65	20-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
3221*: Rowel-----	0-6	Very stony sandy loam.	GM	A-1	35-50	35-50	25-40	15-30	10-20	15-25	NP-5
	6-14	Very cobbly clay, extremely cobbly clay.	GC, GM	A-2	50-65	40-55	30-45	25-45	20-35	45-65	20-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
3300----- Typic Torriorthents	0-10	Gravelly loamy fine sand.	GP, SP, GM, SM	A-1, A-2, A-3	0-15	40-100	25-100	5-80	0-25	---	NP
	10-60	Sand, gravelly loamy fine sand, extremely gravelly coarse sand.	GP, SP, GM, SM	A-1, A-2, A-3	0-15	15-100	10-100	0-70	0-25	---	NP
3310*: Veta-----	0-4	Very gravelly sandy loam.	GM	A-1	0-25	40-55	35-50	20-35	10-20	---	NP
	4-17	Extremely gravelly loam, very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	10-30	40-55	30-50	20-40	15-30	---	NP
	17-60	Stratified extremely gravelly loamy sand to very gravelly loam.	GP-GM, GM	A-1	10-25	30-55	20-50	15-35	5-20	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
3310*: Smedley-----	0-2	Very gravelly sandy loam.	SM, GM	A-1	0-15	50-75	35-50	25-45	15-25	---	NP
	2-18	Gravelly clay loam, gravelly clay, cobbly clay loam.	CL	A-7	5-15	70-85	65-80	60-75	55-70	40-50	15-25
	18-43	Cemented-----	---	---	---	---	---	---	---	---	---
	43-60	Stratified extremely gravelly sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	15-30	30-45	20-35	15-25	5-15	---	NP
4000*: Garhill-----	0-1	Very stony loamy fine sand.	SM	A-1, A-2	20-30	65-80	50-75	40-60	15-30	---	NP
	1-5	Fine sandy loam	SM	A-2, A-4	0-5	80-90	75-90	55-80	20-40	20-25	NP-5
	5-9	Gravelly loam, gravelly sandy loam.	SM, SM-SC, ML, CL-ML	A-4, A-2	0-5	70-85	50-75	40-60	30-55	25-35	5-10
	9-23	Indurated-----	---	---	---	---	---	---	---	---	---
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blacktop-----	0-7	Very stony fine sandy loam.	GM	A-1	25-45	35-65	30-60	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4021*: Argalt-----	0-1	Very stony fine sandy loam.	GM, SM	A-2	35-45	50-70	45-65	40-60	25-35	---	NP
	1-3	Very fine sandy loam.	ML	A-4	0	90-100	90-100	80-90	50-60	20-25	NP-5
	3-9	Loam, clay loam	CL	A-6	0-5	80-95	75-90	60-75	55-70	35-40	15-20
	9-11	Indurated-----	---	---	---	---	---	---	---	---	---
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4030*: Koyen-----	0-4	Gravelly sandy loam.	SM	A-2, A-4	0	65-90	50-75	40-65	25-40	15-25	NP-5
	4-45	Stratified loam to gravelly loamy sand.	SM	A-2, A-4	0	80-90	75-85	50-60	25-40	15-25	NP-5
	45-60	Gravelly loamy sand, very gravelly loamy sand.	GP-GM, GM, SP-SM, SM	A-1	0	50-60	45-55	25-35	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
4030*: Geer-----	0-14 14-60	Fine sandy loam Stratified fine sandy loam to silt loam.	SM, ML ML, SM, SM-SC, CL-ML	A-4 A-4	0 0	100 100	100 100	85-95 85-95	40-65 45-75	15-25 15-30	NP-5 NP-10
4050*: Haarvar-----	0-1 1-14 14	Gravelly clay loam. Clay----- Weathered bedrock	CL CL, CH ---	A-7 A-7 ---	0 0 ---	65-80 95-100 ---	60-75 90-100 ---	55-70 85-95 ---	50-65 75-85 ---	40-45 45-60 ---	25-30 30-45 ---
Wrango-----	0-3 3-10 10-60	Gravelly fine sandy loam. Gravelly fine sandy loam. Extremely gravelly loamy coarse sand, extremely gravelly sand, extremely gravelly loamy sand.	GM, SM SM, GM GP, GP-GM, GM	A-2, A-4 A-2 A-1	0-5 0-5 5-40	60-80 60-80 25-40	55-75 55-75 15-30	45-60 35-55 5-20	25-40 25-35 0-15	--- --- ---	NP NP NP
4061*: Truhoy-----	0-2 2-11 11-17 17-60	Very gravelly fine sandy loam. Gravelly sandy loam, gravelly loam. Cemented----- Stratified very gravelly loamy sand to extremely gravelly coarse sand.	SM, GM SM, GM --- SM, SP-SM, GM, GP-GM	A-1, A-2 A-2, A-4 --- A-1	0-10 0-5 --- 0-10	45-65 60-85 --- 40-65	30-50 50-75 --- 20-45	25-40 40-55 --- 15-30	10-30 25-40 --- 5-15	20-25 20-25 --- ---	NP-5 NP-5 --- NP
Wardenot-----	0-5 5-60	Very gravelly loamy sand. Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GM, SM GP-GM, GM	A-1 A-1	0-10 10-40	45-60 25-50	35-55 20-45	20-40 15-40	10-15 5-15	--- ---	NP NP
4062----- Truhoy	0-2 2-11 11-17 17-60	Gravelly loamy sand. Gravelly sandy loam, gravelly loam. Cemented----- Stratified very gravelly loamy sand to extremely gravelly coarse sand.	SM SM, GM --- SM, SP-SM, GM, GP-GM	A-1 A-2, A-4 --- A-1	0-5 0-5 --- 0-10	60-85 60-85 --- 40-65	50-75 50-75 --- 20-45	30-45 40-55 --- 15-30	10-20 25-40 --- 5-15	--- 20-25 --- ---	NP NP-5 --- NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4070*: Zadvar-----	0-6	Gravelly fine sandy loam.	SM	A-2, A-1	0-5	60-80	50-75	40-60	20-35	20-25	NP-5
	6-11	Gravelly clay loam, sandy clay loam.	GC, CL, SC	A-6	0-5	60-90	55-85	45-75	35-60	35-40	15-20
	11-28 28-60	Cemented----- Stratified extremely gravelly sandy loam to very gravelly coarse sand.	--- GM, GP-GM	--- A-1	--- 0-15	--- 35-55	--- 25-50	--- 15-35	--- 5-15	--- ---	--- NP
Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4071*: Zadvar-----	0-6	Very gravelly sandy loam.	GM	A-1	0-10	45-60	35-50	25-40	15-25	20-25	NP-5
	6-11	Gravelly clay loam, sandy clay loam.	GC, CL, SC	A-6	0-5	60-90	55-85	45-75	35-60	35-40	15-20
	11-28 28-60	Cemented----- Stratified extremely gravelly sandy loam to very gravelly coarse sand.	--- GM, GP-GM	--- A-1	--- 0-15	--- 35-55	--- 25-50	--- 15-35	--- 5-15	--- ---	--- NP
Wrango-----	0-4	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	4-10	Very gravelly sandy loam.	GM, SM, GM-GC, SM-SC	A-1, A-2	0-5	50-70	30-50	20-30	10-25	15-25	NP-10
	10-60	Stratified extremely gravelly sand to extremely gravelly loamy coarse sand.	GP, GP-GM	A-1	5-30	25-40	15-30	5-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
4073*: Zadvar-----	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
	0-6	Gravelly fine sandy loam.	SM	A-2, A-1	0-5	60-80	50-75	40-60	20-35	20-25	NP-5
	6-11	Gravelly clay loam, sandy clay loam.	GC, CL, SC	A-6	0-5	60-90	55-85	45-75	35-60	35-40	15-20
	11-28	Cemented-----	---	---	---	---	---	---	---	---	---
	28-60	Stratified extremely gravelly sandy loam to very gravelly coarse sand.	GM, GP-GM	A-1	0-15	35-55	25-50	15-35	5-15	---	NP
Veet-----	0-5	Gravelly sandy loam.	SM	A-2	0-10	75-90	50-75	40-60	25-35	15-25	NP-5
	5-20	Very gravelly sandy loam.	GM-GC	A-2	10-25	40-60	35-55	25-50	15-25	20-25	5-10
	20-60	Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.	GP-GM, GM	A-1	10-25	45-55	30-50	15-30	5-15	---	NP
4080*: Truvar-----	0-2	Gravelly loamy sand.	SM	A-1	0	90-95	50-75	35-50	10-20	---	NP
	2-17	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1	0	90-95	50-75	25-40	15-25	20-25	NP-5
	17-60	Cemented-----	---	---	---	---	---	---	---	---	---
Crunker-----	0-12	Very gravelly sandy loam.	SM, GM	A-1	5-10	50-65	35-50	25-40	10-25	15-25	NP-5
	12-60	Stratified gravelly coarse sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	5-15	35-55	30-50	20-35	5-15	---	NP
4081*: Truvar-----	0-2	Gravelly loamy sand.	SM	A-1	0	90-95	50-75	35-50	10-20	---	NP
	2-17	Gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1	0	90-95	50-75	25-40	15-25	20-25	NP-5
	17-60	Cemented-----	---	---	---	---	---	---	---	---	---
Fadoll-----	0-10	Gravelly loamy sand.	SM, GM	A-1	0	55-80	50-75	35-50	15-20	---	NP
	10-35	Loamy sand, sand	SM	A-2	0	85-100	75-100	55-65	20-30	---	NP
	35-60	Very gravelly sand.	SP-SM, GP-GM	A-1	0	45-60	35-50	20-30	5-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
4090*: Eaglepass-----	0-1	Extremely stony loam.	GM	A-1, A-2	30-45	30-65	25-60	20-50	15-35	15-25	NP-5
	1-5	Extremely stony loam, very cobbly fine sandy loam, extremely gravelly sandy loam.	GM	A-1, A-2	25-45	30-65	25-60	20-50	10-35	15-25	NP-5
	5	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4100----- Stumble	0-12	Loamy sand-----	SM	A-2	0-5	85-100	85-100	75-90	15-25	---	NP
	12-18	Loamy sand, loamy fine sand.	SM	A-2	0-5	85-100	85-100	55-75	15-25	---	NP
	18-60	Gravelly loamy sand, gravelly loamy fine sand.	SM	A-1, A-2	0-10	75-85	50-70	40-60	15-25	---	NP
4102----- Stumble	0-12	Loamy fine sand	SM	A-2	0-5	85-100	85-100	75-90	15-25	---	NP
	12-18	Loamy sand, loamy fine sand.	SM	A-2	0-5	85-100	85-100	55-75	15-25	---	NP
	18-60	Gravelly loamy sand, gravelly loamy fine sand.	SM	A-1, A-2	0-10	75-85	50-70	40-60	15-25	---	NP
4103*: Stumble-----	0-6	Loamy fine sand	SM	A-2	0-5	85-100	85-100	75-90	15-25	---	NP
	6-29	Loamy sand, loamy fine sand.	SM	A-2	0-5	85-100	85-100	55-75	15-25	---	NP
	29-50	Gravelly loamy sand, gravelly loamy fine sand.	SM	A-1, A-2	0-10	75-85	50-70	40-60	15-25	---	NP
Stumble-----	0-6	Loamy fine sand	SM	A-2	0-5	85-100	85-100	75-90	15-25	---	NP
	6-29	Loamy sand, loamy fine sand.	SM	A-2	0-5	85-100	85-100	55-75	15-25	---	NP
	29-50	Gravelly loamy sand, gravelly loamy fine sand.	SM	A-1, A-2	0-10	75-85	50-70	40-60	15-25	---	NP
4110----- Fadoll	0-10	Loamy sand-----	SM	A-2	0	90-100	85-100	50-70	20-25	---	NP
	10-35	Loamy sand, sand	SM	A-2	0	85-100	75-100	55-65	20-30	---	NP
	35-60	Very gravelly sand.	SP-SM, GP-GM	A-1	0	45-60	35-50	20-30	5-10	---	NP
4121----- Brawley	0-7	Very stony fine sandy loam.	SM, GM	A-2, A-4	15-30	60-85	50-75	40-60	25-40	30-35	NP-5
	7-27	Very gravelly clay, very gravelly clay loam.	GC, GM	A-2	0-10	45-65	30-50	25-40	25-35	40-55	15-25
	27	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
4130*: Penelas-----	0-2	Very channery loam.	GM, GM-GC	A-1, A-2	0-5	30-55	25-50	20-40	15-35	20-30	NP-10
	2-5	Extremely shaly silty clay loam, extremely shaly clay loam.	GC, GP-GC	A-2	0-5	15-30	10-25	5-25	5-25	35-45	15-20
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rodad-----	0-4	Very gravelly loam.	GM, GM-GC	A-1, A-2	0-10	35-60	30-50	25-40	15-30	20-30	NP-10
	4-12	Very channery clay loam, very gravelly clay loam.	GC	A-2, A-6, A-7	0-15	35-65	30-55	25-50	20-45	35-45	15-25
	12	Weathered bedrock	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Very gravelly sandy loam.	GM	A-1	0-10	50-60	35-45	25-40	15-25	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4150*: Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lomoine-----	0-4	Very gravelly sandy loam.	SP-SM, GP-GM, SM, GM	A-1	0-25	45-70	35-50	20-35	5-20	15-25	NP-5
	4-8	Very gravelly sandy loam, very gravelly coarse sandy loam.	SM, GM	A-1	0-30	45-70	30-50	15-35	10-20	15-25	NP-5
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4152*: Stewval-----	0-1	Very stony fine sandy loam.	GM-GC	A-2	25-30	45-60	40-55	30-45	10-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4152*: Pintwater-----	0-6	Very cobbly fine sandy loam.	GM, SM	A-2, A-1	35-45	45-75	40-65	30-50	15-30	20-25	NP-5
	6-11	Very cobbly fine sandy loam, very stony fine sandy loam.	GM, SM	A-1	30-55	30-60	25-50	15-35	10-20	20-25	NP-5
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4153----- Stewval	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4154*: Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Extremely stony loamy coarse sand.	GP-GM, GM, SP-SM, SM	A-1	40-60	45-60	30-60	10-25	5-15	---	NP
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4155*: Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-11	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4156*: Stewval-----	0-1	Very stony fine sandy loam.	GM-GC	A-2	25-30	45-60	40-55	30-45	10-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Beelem-----	0-1	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4157*: Stewval-----	0-1	Very gravelly fine sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	10-20	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Bellehelen-----	0-2	Very gravelly fine sandy loam.	GM	A-1	0-10	35-55	30-45	15-45	10-20	20-25	NP-5
	2-11	Very gravelly loam, very gravelly sandy clay loam, very gravelly clay loam.	GM-GC, GC	A-2	0-25	50-60	35-50	20-40	15-30	25-40	5-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
4159*: Stewval-----	0-1	Very stony fine sandy loam.	GM-GC	A-2	25-30	45-60	40-55	30-45	10-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Extremely stony loamy coarse sand.	GP-GM, GM, SP-SM, SM	A-1	40-60	45-60	30-60	10-25	5-15	---	NP
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Tejabe-----	0-1	Very stony sandy loam.	SM, GM	A-2	15-30	60-70	40-60	35-45	25-35	20-25	NP-5
	1-9	Very gravelly sandy loam.	GM	A-1, A-2	0-10	45-60	30-50	25-40	15-30	20-25	NP-5
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4161*: Terlco-----	0-2	Very gravelly fine sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	2-11	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	11-18	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	18-60	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4162*: Terlco-----	0-4	Very gravelly fine sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	4-17	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	17-25	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	25-64	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
Annaw-----	0-2	Very gravelly loamy sand.	GM, SM	A-1	0-25	40-60	35-50	25-35	10-15	---	NP
	2-13	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	13-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
4163*: Terlco-----	0-2	Very gravelly sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	2-11	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	11-18	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	18-60	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GM, GP-GM, SM, SP-SM	A-1	0-15	35-60	30-50	15-35	5-15	---	NP
	8-60	Stratified gravelly loamy coarse sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4165*, 4166*: Terlco-----	0-2	Very gravelly fine sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	2-11	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	11-18	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	18-60	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
Wardenot-----	0-5	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP
Roic-----	0-2	Gravelly sandy loam.	GM, SM	A-1, A-2	0-5	60-80	50-75	35-55	15-30	---	NP
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
4170*: Downeyville-----	0-4	Very gravelly sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	20-45	15-30	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4171*: Downeyville-----	0-3	Loamy sand-----	SM	A-2	0-5	95-100	85-100	65-80	25-35	---	NP
	3-10	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2	5-10	40-60	30-50	25-45	20-35	25-35	10-15
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hawsley-----	0-8	Sand-----	SM, SP-SM	A-2, A-3	0	100	90-100	75-90	5-20	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4173*: Downeyville-----	0-4	Very gravelly sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	20-45	15-30	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4174*: Downeyville-----	0-4	Very stony fine sandy loam.	SM-SC, SM	A-2, A-1	30-50	70-85	45-65	35-50	15-35	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Stewval-----	0-1	Very stony fine sandy loam.	GM-GC	A-2	25-30	45-60	40-55	30-45	10-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mirkwood-----	0-2	Very stony sandy loam.	SM-SC, SM	A-4, A-2	15-25	75-85	50-65	40-55	30-45	15-25	NP-10
	2-11	Very gravelly loam, very gravelly clay loam.	GC, SC	A-2	5-15	60-75	40-55	30-50	25-35	35-45	15-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4175*: Downeyville-----	0-4	Very stony fine sandy loam.	SM-SC, SM	A-2, A-1	30-50	70-85	45-65	35-50	15-35	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4175*: Downeyville-----	0-4	Very stony fine sandy loam.	SM-SC, SM	A-2, A-1	30-50	70-85	45-65	35-50	15-35	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4176*: Downeyville-----	0-4	Very gravelly fine sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	25-45	15-30	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Downeyville-----	0-4	Very gravelly sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	20-45	15-30	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4177*: Downeyville-----	0-4	Very stony fine sandy loam.	SM-SC, SM	A-2, A-1	30-50	70-85	45-65	35-50	15-35	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mirkwood-----	0-2	Extremely stony sandy loam.	GM-GC, GM	A-2, A-1	40-50	40-60	25-40	20-35	15-25	15-25	NP-10
	2-11	Very gravelly loam, very gravelly clay loam.	GC, SC	A-2	5-15	60-75	40-55	30-50	25-35	35-45	15-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
4177*: Nemico-----	0-2	Very stony fine sandy loam.	SM	A-2	10-25	85-95	65-85	50-65	15-35	---	NP
	2-15	Gravelly clay, gravelly clay loam.	SC, CL, CH	A-7	0-5	70-80	55-75	50-65	40-55	45-60	20-30
	15-16	Indurated-----	---	---	---	---	---	---	---	---	---
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4178*: Downeyville-----	0-1	Very gravelly sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	20-45	15-30	15-25	NP-10
	1-6	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	6	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Stewval-----	0-1	Very gravelly fine sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	10-20	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Blacktop-----	0-7	Very gravelly sandy loam.	GM	A-1	5-10	35-60	30-50	20-40	10-25	20-30	NP-5
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4180*: Candelaria-----	0-1	Very gravelly sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP
Izo-----	0-8	Very gravelly sand.	GM, GP-GM, SM, SP-SM	A-1	0-15	35-60	30-50	15-35	5-15	---	NP
	8-60	Stratified gravelly loamy coarse sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4181*: Candelaria-----	0-1	Very gravelly sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP
Wardenot-----	0-5	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	5-60	Stratified very gravelly fine sandy loam to extremely cobbly loamy sand.	GP-GM, GM	A-1	10-40	25-50	20-45	15-40	5-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
4182*: Candelaria-----	0-1	Very gravelly fine sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP
Gynelle-----	0-2	Very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-60	30-50	15-35	5-15	---	NP
	2-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	35-60	20-40	10-20	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches  Pct	Percentage passing sieve number--				Liquid limit  Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
4182*: Izo-----	0-8	Extremely gravelly loamy sand.	GP	A-1	0-15	20-40	10-25	0-10	0-5	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
4183*: Candelaria-----	0-1	Very gravelly fine sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP
Izo-----	0-8	Very gravelly sand.	GM, GP-GM, SM, SP-SM	A-1	0-15	35-60	30-50	15-35	5-15	---	NP
	8-60	Stratified gravelly loamy coarse sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
4184*: Candelaria-----	0-1	Very gravelly fine sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4184*: Izo-----	0-8	Extremely gravelly loamy sand.	GP	A-1	0-15	20-40	10-25	0-10	0-5	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
4185*: Candelaria-----	0-4	Gravelly loamy sand.	SM	A-1	0	65-80	50-75	20-50	10-20	---	NP
	4-16	Very gravelly sandy loam, very gravelly loamy sand.	GM	A-1	0-10	30-45	25-40	15-35	10-25	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP, GP-GM	A-1	0-10	20-40	20-35	10-20	0-10	---	NP
Typic Torriorthents--	0-6	Gravelly loamy sand.	SM	A-1, A-2	0	60-80	50-75	30-55	10-20	---	NP
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
4186*: Candelaria-----	0-1	Very gravelly fine sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP
Roic-----	0-2	Gravelly sandy loam.	GM, SM	A-1, A-2	0-5	60-80	50-75	35-55	15-30	---	NP
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
4186*: Izo-----	0-8	Very gravelly sand.	GM, GP-GM, SM, SP-SM	A-1	0-15	35-60	30-50	15-35	5-15	---	NP
	8-60	Stratified gravelly loamy coarse sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
4188*: Candelaria-----	0-1	Very gravelly sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP
Downeyville-----	0-4	Very gravelly fine sandy loam.	SM-SC, SM	A-1, A-2	5-20	60-70	30-55	25-45	15-30	15-25	NP-10
	4-9	Very gravelly loam, very gravelly fine sandy loam.	GC	A-2, A-6	10-25	40-60	30-50	25-50	20-40	25-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Annaw-----	0-2	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-80	55-75	35-55	20-35	---	NP
	2-11	Gravelly sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	GM, SM	A-1, A-2	0-15	50-85	45-75	30-60	15-35	---	NP
	11-60	Stratified extremely gravelly loamy coarse sand to very gravelly sandy loam.	GM, GP-GM	A-1	0-25	20-55	20-45	10-20	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4189*: Candelaria-----	0-1	Very gravelly sandy loam.	GM	A-1	0-15	35-50	30-45	25-40	10-20	20-25	NP-5
	1-4	Gravelly fine sandy loam.	SM	A-2	0-10	70-80	65-75	50-60	20-35	20-25	NP-5
	4-16	Very gravelly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam.	GM	A-1	0-10	25-45	20-45	15-25	10-20	15-25	NP-5
	16-60	Stratified extremely gravelly sand to very gravelly loamy coarse sand.	GP-GM, GP	A-1	0-10	25-45	20-35	10-20	0-10	---	NP
Typic Torriorthents--	0-6	Very gravelly loamy sand.	GM, SM	A-1	0-10	45-60	35-55	20-40	10-15	---	NP
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
4190*: Brier-----	0-4	Very stony loam	GM-GC, GM	A-2, A-4	30-50	55-65	50-60	40-50	30-40	25-35	5-10
	4-15	Very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam.	GC	A-2, A-6	30-45	50-70	45-65	40-50	30-45	30-40	10-20
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Beelem-----	0-1	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-85	30-50	25-35	15-30	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Wassit-----	0-6	Very gravelly sandy loam.	GM	A-1, A-2	0-10	45-65	35-50	25-40	15-30	20-25	NP-5
	6-12	Very gravelly loam, very gravelly clay loam.	GC	A-2	0-10	45-65	30-50	25-40	20-35	30-45	10-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4191*: Brier-----	0-4	Very stony loam	GM-GC, GM	A-2, A-4	30-50	55-65	50-60	40-50	30-40	25-35	5-10
	4-15	Very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam.	GC	A-2, A-6	30-45	50-70	45-65	40-50	30-45	30-40	10-20
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4191*: Brawley-----	0-7	Very stony fine sandy loam.	SM, GM	A-2, A-4	15-30	60-85	50-75	40-60	25-40	30-35	NP-5
	7-27	Very gravelly clay, very gravelly clay loam.	GC, GM	A-2	0-10	45-65	30-50	25-40	25-35	40-55	15-25
	27	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
4192*: Brier-----	0-4	Very stony loam	GM-GC, GM	A-2, A-4	30-50	55-65	50-60	40-50	30-40	25-35	5-10
	4-15	Very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam.	GC	A-2, A-6	30-45	50-70	45-65	40-50	30-45	30-40	10-20
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Katyblay-----	0-16	Fine sandy loam	SM	A-2, A-5	0	95-100	85-100	75-90	25-40	40-50	NP-5
	16-33	Gravelly fine sandy loam.	SM	A-2	0	65-80	55-70	50-65	20-25	25-30	NP-5
	33-60	Very gravelly sandy clay loam, very gravelly loam.	SM-SC, GM-GC, SC, GC	A-2	0-10	35-65	25-55	20-45	15-25	25-35	5-15
Hiridge-----	0-4	Very gravelly sandy loam.	SM	A-1	0-15	80-90	30-50	20-40	10-25	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23	Weathered bedrock	---	---	---	---	---	---	---	---	---
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
4200----- Sonoma	0-6	Silt loam-----	ML	A-4	0	100	100	95-100	75-85	20-35	NP-10
	6-44	Silt loam, silty clay loam.	CL, ML	A-6, A-7	0	100	100	95-100	80-90	35-45	10-20
	44-60	Stratified coarse sand to silt loam.	SM	A-4	0	100	100	60-80	35-50	15-30	NP-5
4210, 4211, 4212- Sagouspe	0-11	Sand-----	SM	A-2	0	100	100	50-70	10-20	---	NP
	11-60	Stratified coarse sand to silt loam.	SM	A-2, A-4	0	100	100	50-75	15-40	---	NP
4220*: Patna-----	0-8	Sand-----	SM	A-2	0	95-100	95-100	60-70	15-25	---	NP
	8-15	Sandy loam, fine sandy loam, coarse sandy loam.	SM-SC	A-4	0	95-100	95-100	65-80	35-50	25-30	5-10
	15-36	Sand, loamy sand	SP-SM, SM	A-2, A-3	0	95-100	95-100	50-60	5-20	---	NP
	36-60	Fine sand, loamy fine sand, loamy sand.	SM	A-2	0	95-100	95-100	60-80	15-35	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
4220*: Hawsley-----	0-8	Sand-----	SM, SP-SM	A-2, A-3	0	100	90-100	75-90	5-20	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP
4221----- Patna	0-6	Sand-----	SM	A-2	0	95-100	95-100	60-70	15-25	---	NP
	6-24	Sandy loam, fine sandy loam, coarse sandy loam.	SM-SC	A-4	0	95-100	95-100	65-80	35-50	25-30	5-10
	24-43 43-60	Sand, loamy sand Fine sand, loamy fine sand, loamy sand.	SP-SM, SM SM	A-2, A-3 A-2	0 0	95-100 95-100	95-100 95-100	50-60 60-80	5-20 15-35	--- ---	NP NP
4230*: Typic Torriorthents--	0-6	Gravelly loamy sand.	SM	A-1, A-2	0	60-80	50-75	30-55	10-20	---	NP
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
Patna-----	0-6	Sand-----	SM	A-2	0	95-100	95-100	60-70	15-25	---	NP
	6-24	Sandy loam, fine sandy loam, coarse sandy loam.	SM-SC	A-4	0	95-100	95-100	65-80	35-50	25-30	5-10
	24-43 43-60	Sand, loamy sand Fine sand, loamy fine sand, loamy sand.	SP-SM, SM SM	A-2, A-3 A-2	0 0	95-100 95-100	95-100 95-100	50-60 60-80	5-20 15-35	--- ---	NP NP
Badland.											
4240----- Typic Torriorthents	0-6	Gravelly loamy sand.	SM	A-1, A-2	0	60-80	50-75	30-55	10-20	---	NP
	6-60	Stratified silt loam to very gravelly sand.	SM, SM-SC, GM-GC, GM	A-1, A-2	0-10	50-80	35-65	20-45	10-35	15-30	NP-10
4250*: Bango-----	0-6	Sandy loam-----	SM	A-1, A-2	0-5	90-95	90-95	45-60	15-30	---	NP
	6-12	Loam, clay loam, sandy clay loam.	CL	A-6	0-5	90-100	90-100	75-90	55-75	30-35	10-15
	12-60	Stratified gravelly loamy coarse sand to silty clay loam.	CL, CL-ML	A-6, A-4	0-5	85-95	85-95	70-85	55-70	25-35	5-15
Hawsley-----	0-8	Sand-----	SM, SP-SM	A-2, A-3	0	100	90-100	75-90	5-20	---	NP
	8-42	Stratified fine sand to coarse sand.	SM, SP-SM	A-2, A-3	0	85-100	75-100	55-70	5-25	---	NP
	42-60	Fine sand-----	SM, SP-SM	A-2, A-3	0	100	100	75-90	5-25	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
5010*: Mopana-----	0-4	Stony fine sandy loam.	SM	A-2, A-4	10-15	80-90	75-90	65-75	30-40	30-40	NP-5
	4-8	Loam-----	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	75-85	55-65	25-35	5-15
	8-19	Gravelly clay loam, clay.	SC, CL, CH	A-7	0-10	70-95	60-100	55-85	45-75	40-55	20-30
	19-60	Indurated-----	---	---	---	---	---	---	---	---	---
Nire-----	0-15	Stony fine sandy loam.	SM	A-2	10-30	65-95	60-90	50-75	15-25	35-45	NP-5
	15-39	Very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam.	SM, GM	A-1, A-2	25-50	50-70	45-65	35-60	15-25	45-55	NP-5
	39-60	Cobbly clay-----	CL, CH	A-7	15-30	75-95	70-90	70-90	60-85	45-55	20-30
5011*: Mopana-----	0-4	Very stony sandy loam.	GM	A-1, A-2	25-40	45-65	35-55	25-45	20-30	30-40	NP-5
	4-8	Loam-----	CL, CL-ML	A-4, A-6	0-10	90-100	85-100	75-85	55-65	25-35	5-15
	8-19	Gravelly clay loam, clay.	SC, CL, CH	A-7	0-10	70-95	60-100	55-85	45-75	40-55	20-30
	19-60	Indurated-----	---	---	---	---	---	---	---	---	---
Holtle Variant--	0-13	Sandy loam-----	SM	A-2	0	80-100	75-100	50-75	25-35	25-35	NP-5
	13-50	Sandy loam-----	SM	A-2	0	80-100	75-100	50-75	25-35	25-35	NP-5
	50-60	Cemented-----	---	---	---	---	---	---	---	---	---
5050*: Nire-----	0-15	Stony fine sandy loam.	SM	A-2	10-30	65-95	60-90	50-75	15-25	35-45	NP-5
	15-39	Very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam.	SM, GM	A-1, A-2	25-50	50-70	45-65	35-60	15-25	45-55	NP-5
	39-60	Cobbly clay-----	CL, CH	A-7	15-30	75-95	70-90	70-90	60-85	45-55	20-30
Epvip-----	0-8	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-85	50-75	35-50	20-30	20-25	NP-5
	8-19	Very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-10	45-65	35-50	20-40	15-35	30-40	10-20
	19-30	Weathered bedrock	---	---	---	---	---	---	---	---	---
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hiridge-----	0-4	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-85	50-75	35-55	15-30	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23	Weathered bedrock	---	---	---	---	---	---	---	---	---
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
5051----- Nire	0-15	Stony fine sandy loam.	SM	A-2	10-30	65-95	60-90	50-75	15-25	35-45	NP-5
	15-39	Very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam.	SM, GM	A-1, A-2	25-50	50-70	45-65	35-60	15-25	45-55	NP-5
	39-60	Cobbly clay-----	CL, CH	A-7	15-30	75-95	70-90	70-90	60-85	45-55	20-30
5052*: Nire-----	0-15	Very stony sandy loam.	SM, GM	A-1, A-2	15-40	55-85	50-80	40-65	10-20	35-45	NP-5
	15-39	Very gravelly fine sandy loam, very stony fine sandy loam, very gravelly sandy loam.	SM, GM	A-1, A-2	25-50	50-70	45-65	35-60	15-25	45-55	NP-5
	39-60	Cobbly clay-----	CL, CH	A-7	15-30	75-95	70-90	70-90	60-85	45-55	20-30
Hiridge-----	0-4	Stony sandy loam	SM	A-1, A-2	5-10	60-85	50-75	35-55	15-30	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23 23	Weathered bedrock Unweathered bedrock.	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
5080*: Epvip-----	0-8	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-85	50-75	35-50	20-30	20-25	NP-5
	8-19	Very gravelly sandy clay loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-10	45-65	35-50	20-40	15-35	30-40	10-20
	19-30 30	Weathered bedrock Unweathered bedrock.	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Hiridge-----	0-4	Gravelly sandy loam.	SM	A-1, A-2	0-10	60-85	50-75	35-55	15-30	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23 23	Weathered bedrock Unweathered bedrock.	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Katyblay-----	0-16	Fine sandy loam	SM	A-2, A-5	0	95-100	85-100	75-90	25-40	40-50	NP-5
	16-33	Gravelly fine sandy loam.	SM	A-2	0	65-80	55-70	50-65	20-25	25-30	NP-5
	33-60	Very gravelly sandy clay loam, very gravelly loam.	SM-SC, GM-GC, SC, GC	A-2	0-10	35-65	25-55	20-45	15-25	25-35	5-15

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
5100*: Oricto-----	0-3	Very gravelly fine sandy loam.	GM	A-1, A-2	10-25	40-60	35-55	25-45	15-30	15-25	NP-5
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	0-30	30-60	25-50	10-35	0-15	---	NP
Gynelle-----	0-3	Very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-60	30-50	15-35	5-15	---	NP
	3-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	35-60	20-40	10-20	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
5101*: Oricto-----	0-3	Very gravelly sandy loam.	GM	A-1, A-2	10-25	40-60	35-55	25-45	15-30	15-25	NP-5
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	0-30	30-60	25-50	10-35	0-15	---	NP
Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
5103*: Oricto-----	0-3	Loamy sand-----	SM	A-2	0-5	85-95	85-90	60-70	15-25	---	NP
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-25	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	15-30	30-60	25-50	10-35	0-15	---	NP
Sundown-----	0-3	Loamy sand-----	SM	A-1	0-5	95-100	85-100	25-40	10-25	---	NP
	3-60	Loamy fine sand	SM	A-2	0-5	95-100	85-100	70-85	15-30	---	NP
Oricto-----	0-3	Gravelly sandy loam.	GM, SM	A-2, A-4	0-10	60-80	55-75	45-60	30-45	15-25	NP-5
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	0-30	30-60	25-50	10-35	0-15	---	NP
5105*: Oricto-----	0-3	Gravelly loamy sand.	SM	A-1, A-2	0-10	70-80	55-75	45-60	20-35	---	NP
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	0-30	30-60	25-50	10-35	0-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
5105*: Luning-----	0-6	Gravelly loamy sand.	SM	A-1	0-10	60-75	55-70	30-50	10-20	---	NP
	6-35	Loamy fine sand, fine sand.	SM	A-2	0	90-100	75-100	55-80	10-30	---	NP
	35-60	Stratified very gravelly sand to gravelly loamy fine sand.	GP, SP	A-1	0-10	35-60	25-45	10-30	0-5	---	NP
5106*: Oricto-----	0-3	Very gravelly sandy loam.	GM	A-1, A-2	10-25	40-60	35-55	25-45	15-30	15-25	NP-5
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-30	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam.	GP-GM, GM	A-1	15-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	0-30	30-60	25-50	10-35	0-15	---	NP
Barnmot-----	0-2	Gravelly clay loam.	SC	A-6	0-5	75-85	55-75	45-60	35-45	35-40	15-20
	2-60	Clay, clay loam	CH, MH	A-7	0	90-100	90-100	80-95	70-85	50-60	20-30
Gynelle-----	0-2	Very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1	0-10	40-60	30-50	15-35	5-15	---	NP
	2-60	Stratified very gravelly sandy loam to extremely cobbly coarse sand.	SM, GM	A-1	15-40	50-70	35-60	20-40	10-20	---	NP
5107*: Oricto-----	0-3	Very cobbly fine sandy loam.	GM, SM	A-1, A-2	25-40	50-70	45-65	35-55	20-35	15-25	NP-5
	3-8	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	5-25	45-60	35-55	20-40	10-35	30-35	10-15
	8-14	Extremely cobbly sandy loam, very gravelly coarse sandy loam, very gravelly sandy loam.	GP-GM, GM	A-1	10-45	35-55	30-50	10-35	5-20	15-25	NP-5
	14-60	Stratified extremely gravelly coarse sand to very gravelly loamy sand.	GP, GM, GP-GM, SP-SM	A-1	15-30	30-60	25-50	10-35	0-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
5107*: Terlco-----	0-2	Very gravelly fine sandy loam.	GM	A-1	0-5	40-60	30-50	25-40	10-25	20-25	NP-5
	2-11	Gravelly clay loam, gravelly loam, gravelly sandy loam.	CL, GC, SC	A-6, A-7	0-5	65-80	55-75	45-70	35-55	25-45	10-20
	11-18	Very gravelly sandy loam.	GM	A-1	0-30	40-60	35-50	15-40	10-25	20-25	NP-5
	18-60	Very gravelly loamy sand, very gravelly sand, very cobbly loamy sand.	SP-SM, SM, GP-GM, GM	A-1	0-40	45-70	35-50	10-30	5-15	---	NP
Roic-----	0-2	Very gravelly fine sandy loam.	GM	A-1, A-2	0-5	40-60	30-50	20-40	15-30	20-25	NP-5
	2-5	Very fine sandy loam, fine sandy loam, loam.	CL-ML, SM-SC, ML, SM	A-4	0	90-100	80-100	70-90	35-70	20-30	NP-10
	5	Weathered bedrock	---	---	---	---	---	---	---	---	---
5110----- Cucamungo Variant	0-7	Gravelly sandy loam.	SM	A-1, A-2	0	75-85	50-75	40-55	20-35	---	NP
	7-11	Gravelly sandy loam, gravelly coarse sandy loam.	SM-SC	A-2	0	80-95	60-75	25-40	15-25	25-30	5-10
	11-21	Gravelly sandy clay loam.	SC	A-2	0	75-90	55-70	30-45	20-30	30-35	10-15
	21	Weathered bedrock	---	---	---	---	---	---	---	---	---
6000*: Hiridge-----	0-4	Very gravelly sandy loam.	SM	A-1	0-15	80-90	30-50	20-40	10-25	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23	Weathered bedrock	---	---	---	---	---	---	---	---	---
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Katyblay-----	0-16	Gravelly fine sandy loam.	SM	A-2	0	65-80	55-70	50-65	20-25	40-50	NP-5
	16-33	Gravelly fine sandy loam.	SM	A-2	0	65-80	55-70	50-65	20-25	25-30	NP-5
	33-60	Very gravelly sandy clay loam, very gravelly loam.	SM-SC, GM-GC, SC, GC	A-2	0-10	35-65	25-55	20-45	15-25	25-35	5-15
Granmount-----	0-10	Very gravelly fine sandy loam.	GM, SM	A-1, A-2	5-25	45-65	35-55	30-45	20-30	20-30	NP-5
	10-33	Extremely gravelly clay, very gravelly clay.	GC	A-2	10-25	20-50	15-45	10-45	10-35	45-55	20-25
	33-60	Very cobbly clay loam.	GC	A-6, A-7	40-50	60-70	50-60	40-55	35-45	35-45	15-20

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
6001----- Hiridge	0-4	Very gravelly sandy loam.	SM	A-1	0-15	80-90	30-50	20-40	10-25	20-25	NP-5
	4-18	Very gravelly clay loam, very gravelly loam.	SC	A-2	0-5	80-90	30-50	25-45	15-35	30-40	10-15
	18-23 23	Weathered bedrock Unweathered bedrock.	---	---	---	---	---	---	---	---	---
6010----- Typic Cryorthents	0-22	Loamy fine sand	SM	A-2, A-5	0-10	85-100	75-100	70-80	30-40	40-60	NP-5
	22-60	Gravelly fine sandy loam, very gravelly fine sandy loam, gravelly loam.	SM, GM	A-1, A-2, A-4	0-10	45-80	35-70	30-65	20-50	20-25	NP-5
6020*: Celeton-----	0-2	Very gravelly loam.	GM	A-1, A-2	0-5	50-65	25-40	20-35	20-30	40-50	NP-5
	2-5	Gravelly sandy loam, gravelly loam.	SM, ML, MH	A-5	0-5	75-95	65-95	50-85	35-65	40-60	NP-5
	5-9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Dumps. Izo-----	0-8	Very gravelly sand.	GP, GP-GM, SP, SP-SM	A-1	0-15	35-60	30-50	15-35	0-10	---	NP
	8-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM	A-1	0-15	20-40	15-35	10-20	0-10	---	NP
6060----- Wiskiflat	0-10	Gravelly loamy sand.	SM	A-1, A-2	0-10	75-90	50-75	30-45	15-30	---	NP
	10-60	Stratified very gravelly sandy loam to very gravelly coarse sand.	SM	A-1	0-10	55-75	30-50	20-40	10-25	---	NP
6070*: Breko-----	0-5	Gravelly sandy loam.	SM	A-1, A-2	0-5	65-80	55-75	35-60	15-35	15-25	NP-5
	5-19	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	35-60	25-50	15-45	10-35	30-40	10-20
	19-60	Stratified gravelly sandy loam to extremely gravelly loamy sand.	GP-GM	A-1	0	35-45	10-35	5-15	5-10	15-25	NP-5

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
6070*: Crunker-----	0-12	Very gravelly sandy loam.	SM, GM	A-1	5-10	50-65	35-50	25-40	10-25	15-25	NP-5
	12-60	Stratified gravelly coarse sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	5-15	35-55	30-50	20-35	5-15	---	NP
6071----- Breko	0-6	Stony loamy sand	SM	A-1, A-2	5-15	60-85	55-80	20-55	10-30	---	NP
	6-21	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	35-60	25-50	15-45	10-35	30-40	10-20
	21-29	Extremely gravelly sandy clay loam.	GP-GC	A-2	0	25-40	10-25	10-20	5-10	30-40	10-20
	29-60	Stratified gravelly sandy loam to extremely gravelly loamy sand.	GP-GM	A-1	0	35-45	10-35	5-15	5-10	15-25	NP-5
6072*: Breko-----	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-5	65-80	55-75	35-60	15-35	15-25	NP-5
	6-21	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	35-60	25-50	15-45	10-35	30-40	10-20
	21-29	Extremely gravelly sandy clay loam.	GP-GC	A-2	0	25-40	10-25	10-20	5-10	30-40	10-20
	29-60	Stratified gravelly sandy loam to extremely gravelly loamy sand.	GP-GM	A-1	0	35-45	10-35	5-15	5-10	15-25	NP-5
Wiskiflat-----	0-10	Gravelly loamy sand.	SM	A-1, A-2	0-10	75-90	50-75	30-45	15-30	---	NP
	10-60	Stratified very gravelly sandy loam to very gravelly coarse sand.	SM	A-1	0-10	55-75	30-50	20-40	10-25	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
6073----- Breko	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-5	65-80	55-75	35-60	15-35	15-25	NP-5
	6-21	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	35-60	25-50	15-45	10-35	30-40	10-20
	21-29	Extremely gravelly sandy clay loam.	GP-GC	A-2	0	25-40	10-25	10-20	5-10	30-40	10-20
	29-60	Stratified gravelly sandy loam to extremely gravelly loamy sand.	GP-GM	A-1	0	35-45	10-35	5-15	5-10	15-25	NP-5
6081*: Handpah-----	0-3	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-65	30-50	20-45	15-35	25-30	5-10
	3-15	Gravelly clay loam, gravelly loam, gravelly sandy clay loam.	SC, GC	A-6	0-10	60-85	60-75	50-60	40-50	35-40	15-20
	15-24	Indurated-----	---	---	---	---	---	---	---	---	---
	24-60	Cemented-----	---	---	---	---	---	---	---	---	---
Breko-----	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-5	65-80	55-75	35-60	15-35	15-25	NP-5
	6-21	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	35-60	25-50	15-45	10-35	30-40	10-20
	21-29	Extremely gravelly sandy clay loam.	GP-GC	A-2	0	25-40	10-25	10-20	5-10	30-40	10-20
	29-60	Stratified gravelly sandy loam to extremely gravelly loamy sand.	GP-GM	A-1	0	35-45	10-35	5-15	5-10	15-25	NP-5
Crunker-----	0-12	Very gravelly sandy loam.	SM, GM	A-1	5-10	50-65	35-50	25-40	10-25	15-25	NP-5
	12-60	Stratified gravelly coarse sand to extremely gravelly sandy loam.	GP-GM, GM	A-1	5-15	35-55	30-50	20-35	5-15	---	NP

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
6082*: Handpah-----	0-6	Gravelly sandy loam.	SM, GM	A-2	0-10	60-85	50-75	40-65	25-35	15-25	NP-5
	6-17	Gravelly clay loam, gravelly loam, gravelly sandy clay loam.	SC, GC	A-6	0-10	60-85	60-75	50-60	40-50	35-40	15-20
	17-19	Very gravelly sandy loam.	GP-GM, GM	A-1	10-25	40-55	25-45	20-30	5-15	---	NP
	19-22 22-60	Indurated----- Cemented-----	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Breko-----	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-5	65-80	55-75	35-60	15-35	15-25	NP-5
	6-21	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	35-60	25-50	15-45	10-35	30-40	10-20
	21-29	Extremely gravelly sandy clay loam.	GP-GC	A-2	0	25-40	10-25	10-20	5-10	30-40	10-20
	29-60	Stratified gravelly sandy loam to extremely gravelly loamy sand.	GP-GM	A-1	0	35-45	10-35	5-15	5-10	15-25	NP-5
6092*: Beelem-----	0-1	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-85	30-50	25-35	15-30	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Wassit-----	0-6	Very stony sandy loam.	GM	A-1, A-2	25-45	50-65	35-55	25-40	15-30	20-25	NP-5
	6-12	Very gravelly loam, very gravelly clay loam.	GC	A-2	0-10	45-65	30-50	25-40	20-35	30-45	10-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
6093*: Beelem-----	0-1	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-85	30-50	25-35	15-30	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
6093*: Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
6094*: Beelem-----	0-1	Very gravelly sandy loam.	SM	A-1, A-2	0-10	70-85	30-50	25-35	15-30	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Bellehelen-----	0-5	Very stony loam	SM, GM	A-4	10-40	65-80	55-70	45-55	35-50	20-25	NP-5
	5-11	Very gravelly loam, very gravelly sandy clay loam, very gravelly clay loam.	GM-GC, GC	A-2	0-25	50-60	35-50	20-40	15-30	25-40	5-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Stewval-----	0-1	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	15-25	20-25	5-10
	1-4	Extremely gravelly loam, very gravelly clay loam, very gravelly loam.	GC	A-2	0-25	20-55	15-45	10-35	10-30	30-40	10-20
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
7000*: Logring-----	0-3	Very gravelly fine sandy loam.	GM-GC	A-2	0-10	35-55	30-45	25-35	10-20	20-25	5-10
	3-13	Very gravelly loam, very gravelly fine sandy loam.	GM-GC	A-2	0-10	35-55	30-45	25-35	15-25	20-25	5-10
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7001*: Logring-----	0-3	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	10-25	20-25	5-10
	3-13	Very gravelly loam, very gravelly fine sandy loam.	GM-GC	A-2	0-10	35-55	30-45	25-35	15-25	20-25	5-10
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
7002*: Logring-----	0-3	Very gravelly sandy loam.	GM-GC	A-2	0-10	35-55	30-45	20-35	10-25	20-25	5-10
	3-13	Very gravelly loam, very gravelly fine sandy loam.	GM-GC	A-2	0-10	35-55	30-45	25-35	15-25	20-25	5-10
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Eaglepass-----	0-1	Very stony sandy loam.	GM	A-1	15-30	40-60	30-50	15-40	10-25	15-25	NP-5
	1-3	Extremely stony loam, very cobbly fine sandy loam, extremely gravelly sandy loam.	GM	A-1, A-2	25-45	30-65	25-60	20-50	10-35	15-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kyler-----	0-3	Very gravelly fine sandy loam.	GM, GM-GC, SM, SM-SC	A-1, A-2	0-20	40-60	30-50	25-40	10-20	15-25	NP-10
	3-7	Very cobbly loam, very gravelly loam.	GM, GM-GC, SM, SM-SC	A-2, A-4	25-40	55-70	50-65	40-60	25-40	15-25	NP-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
7010*: Armoine-----	0-4	Very gravelly sandy loam.	SM	A-1	5-10	70-85	30-50	20-35	10-20	15-20	NP-5
	4-15	Very gravelly sandy clay loam, very gravelly sandy loam.	SM-SC, SM	A-2	0-5	70-85	30-50	25-45	15-35	25-35	5-10
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
7010*: Beelem-----	0-1	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	1-3	Gravelly sandy loam.	SM	A-2	0-10	80-90	55-75	40-50	25-35	20-25	NP-5
	3	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
7012*: Armoine-----	0-5	Very cobbly sandy loam.	SM	A-1	25-40	70-85	40-65	30-40	15-25	15-20	NP-5
	5-15	Very gravelly sandy clay loam, very gravelly sandy loam.	SM-SC, SM	A-2	0-5	70-85	30-50	25-45	15-35	25-35	5-10
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
Petspring-----	0-1	Very bouldery coarse sandy loam.	SP-SM, SM	A-1	15-30	80-90	25-50	15-30	5-20	20-25	NP-5
	1-3	Very gravelly coarse sandy loam.	SM	A-1	0-15	80-90	30-50	15-30	10-20	20-25	NP-5
	3	Weathered bedrock	---	---	---	---	---	---	---	---	---
7020*: Squawtip-----	0-10	Very stony loam	SM	A-4	30-50	80-90	70-85	50-60	35-50	15-25	NP-5
	10-31	Very cobbly loam, very gravelly sandy clay loam, very gravelly sandy loam.	SC, SM-SC	A-2	10-45	60-70	45-55	20-40	15-35	25-35	5-15
	31-35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Brier-----	0-7	Very stony loam	GM-GC, GM	A-2, A-4	30-50	55-65	50-60	40-50	30-40	25-35	5-10
	7-15	Very cobbly clay loam, very cobbly loam, very cobbly sandy clay loam.	GC	A-2, A-6	30-45	50-70	45-65	40-50	30-45	30-40	10-20
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
7021*: Squawtip-----	0-5	Very stony loam	SM	A-4	30-50	80-90	70-85	50-60	35-50	15-25	NP-5
	5-38	Very cobbly loam, very gravelly sandy clay loam, very gravelly sandy loam.	SC, SM-SC	A-2	10-45	60-70	45-55	20-40	15-35	25-35	5-15
	38	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7021*: Gabbvally-----	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
8030*: Ravenswood-----	0-10	Very stony loam	CL-ML	A-4	15-25	80-100	75-100	60-80	50-70	25-30	5-10
	10-13	Very gravelly clay loam.	GC	A-2	5-15	45-60	35-50	30-45	20-35	40-50	15-25
	13-30	Very gravelly clay, very gravelly clay loam.	GC	A-2, A-7	5-15	45-60	35-50	30-45	25-40	40-55	20-30
	30-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Brier-----	0-4	Very stony loam	GM-GC, GM	A-2, A-4	30-50	55-65	50-60	40-50	30-40	25-35	5-10
	4-15	Very cobbly clay loam, very cobbly sandy clay loam.	GC	A-2, A-6	30-45	50-70	45-65	40-50	30-45	30-40	10-20
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Itca-----	0-2	Very stony loam	GM-GC, GC	A-4, A-6	30-50	60-75	50-65	45-60	35-50	25-35	5-15
	2-14	Very cobbly clay loam, very gravelly clay, extremely gravelly clay.	CL, GC	A-7, A-2	0-55	40-80	30-75	25-70	20-60	40-50	15-25
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
8040*: Jetcop-----	0-6	Very stony loamy sand.	SM	A-1, A-2	15-30	65-80	50-75	30-50	20-35	---	NP
	6-16	Gravelly clay loam, gravelly clay.	SC, GC, SM, GM	A-6, A-7	0-10	65-80	50-75	40-70	35-45	35-50	15-20
	16-60	Indurated-----	---	---	---	---	---	---	---	---	---
Gabbvally-----	0-2	Very stony loam	GM	A-4	10-40	60-75	55-70	45-55	35-50	20-25	NP-5
	2-8	Very gravelly sandy clay loam, very gravelly sandy loam, very gravelly loam.	GC, GM-GC	A-2	0-15	50-60	35-50	25-35	15-25	25-35	5-15
	8	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
8050*: Itca-----	<u>In</u> 0-2 2-14 14	Very stony loam Very cobbly clay loam, very gravelly clay, extremely gravelly clay. Unweathered bedrock.	GM-GC, GC CL, GC ---	A-4, A-6 A-7, A-2 ---	30-50 0-55 ---	60-75 40-80 ---	50-65 30-75 ---	45-60 25-70 ---	35-50 20-60 ---	25-35 40-50 ---	5-15 15-25 ---
Teguro-----	0-4 4-15 15	Very stony loam Gravelly clay loam, gravelly loam. Unweathered bedrock.	SM SC ---	A-4 A-2, A-6 ---	10-25 0-10 ---	70-80 65-80 ---	60-75 50-75 ---	45-60 35-60 ---	35-50 30-50 ---	15-25 30-40 ---	NP-5 15-20 ---
Rock outcrop.											

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Acana Family-----	Loamy, mixed, mesic, shallow Xerollic Durargids
Advokay-----	Loamy, mixed, mesic, shallow Typic Haplargids
Annaw-----	Sandy-skeletal, mixed, mesic Typic Camborthids
Antholop-----	Clayey, montmorillonitic, mesic, shallow Abruptic Xerollic Durargids
Argalt-----	Loamy, mixed, mesic, shallow Xerollic Durargids
Armespan-----	Loamy-skeletal, mixed, mesic Durixerollic Calciorrhids
Armoine-----	Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids
Baldy Variant-----	Fine-silty, mixed, nonacid Typic Cryorthents
Bango-----	Fine-loamy, mixed, mesic Haplic Natrargids
Barnmot-----	Fine, montmorillonitic (calcareous), mesic Typic Torriorthents
Beano-----	Loamy-skeletal, mixed, mesic, shallow Haplic Durargids
Beelem-----	Loamy, mixed (calcareous), mesic Lithic Xeric Torriorthents
Bellehelen-----	Loamy-skeletal, mixed, mesic Lithic Argixerolls
Beltd-----	Loamy, mixed, mesic, shallow Haplic Durargids
Bijorja-----	Coarse-loamy, mixed, mesic Xerollic Camborthids
Blacktop-----	Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents
Bluewing-----	Sandy-skeletal, mixed, mesic Typic Torriorthents
Bombadil Family-----	Loamy, mixed, mesic Lithic Xerollic Haplargids
Borealis-----	Fine, mixed, frigid Abruptic Durixeralfs
Borealis Family-----	Fine, mixed, frigid Abruptic Durixeralfs
Bouncer-----	Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids
Brawley-----	Clayey-skeletal, montmorillonitic, frigid Mollic Palexeralfs
Bregar Family-----	Loamy-skeletal, mixed, frigid Lithic Xerollic Haplargids
Breko-----	Loamy-skeletal, mixed, mesic Xerollic Haplargids
Brier-----	Loamy-skeletal, mixed, mesic Lithic Argixerolls
Buckaroo-----	Fine, montmorillonitic, mesic Typic Natrargids
Budihol-----	Loamy, mixed, nonacid, mesic, shallow Xeric Torriorthents
Bulake Family-----	Clayey, montmorillonitic, frigid Lithic Mollic Haploxeralfs
Bylo Variant-----	Fine-silty, mixed, mesic Typic Camborthids
Calpeak-----	Loamy-skeletal, mixed (calcareous), mesic, shallow Xeric Torriorthents
Candelaria-----	Sandy-skeletal, mixed, mesic Typic Calciorrhids
Celeton-----	Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents
Chill-----	Loamy, mixed, mesic, shallow Xerollic Haplargids
Chuckridge-----	Loamy, mixed, mesic, shallow Xerollic Durargids
Cirac-----	Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents
Clanalpine Family-----	Loamy-skeletal, mixed, frigid Typic Argixerolls
Cleaver-----	Loamy, mixed, mesic, shallow Typic Durargids
Coutis Family-----	Coarse-loamy, mixed Pachic Cryoborolls
Crunker-----	Sandy-skeletal, mixed, mesic Durorthidic Xeric Torriorthents
Crunkvar-----	Sandy-skeletal, mixed, mesic Xeric Torriorthents
Cucamungo Variant-----	Fine-loamy, mixed, frigid Typic Argixerolls
Dakent-----	Loamy-skeletal, mixed, mesic Durixerollic Calciorrhids
Dedmount-----	Fine, montmorillonitic (calcareous), mesic Aquic Torriorthents
Deefan-----	Clayey, montmorillonitic, mesic, shallow Haplic Durargids
Downeyville-----	Loamy-skeletal, mixed, mesic Lithic Haplargids
Eaglepass-----	Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents
Eastgate-----	Sandy, mixed, mesic Typic Camborthids
Epvip-----	Loamy-skeletal, mixed, frigid, shallow Aridic Argixerolls
Fadoll-----	Ashy, nonacid, mesic Xeric Torriorthents
Fallon-----	Coarse-loamy, mixed, mesic Aquic Xerofluvents
Fawin-----	Sandy, mixed, mesic Typic Camborthids
Fettic Variant-----	Fine-loamy, mixed, mesic Aridic Natriferolls
Fulstone-----	Clayey, montmorillonitic, mesic, shallow Abruptic Xerollic Durargids
Fusuvar-----	Loamy, mixed, shallow Typic Cryoborolls
Gabbvally-----	Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids
Garhill-----	Loamy, mixed, mesic, shallow Typic Durorthids
Geer-----	Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents
Goldyke-----	Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents
Granmount-----	Clayey-skeletal, mixed Argic Cryoborolls
Gynelle-----	Sandy-skeletal, mixed, mesic Typic Torriorthents
Haar-----	Loamy, mixed, nonacid, mesic, shallow Xeric Torriorthents

TABLE 6.--CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
Haarvar-----	Clayey, montmorillonitic (calcareous), mesic, shallow Xeric Torriorthents
Handpah-----	Loamy, mixed, mesic, shallow Xerollic Durargids
Hapgood Family-----	Loamy-skeletal, mixed Pachic Cryoborolls
Hawsley-----	Mixed, mesic Typic Torripsamments
Hiridge-----	Loamy-skeletal, mixed, shallow Argic Cryoborolls
Holtle Variant-----	Coarse-loamy, mixed, frigid Aridic Duric Haploxerolls
Inmo-----	Sandy-skeletal, mixed, mesic Typic Torriorthents
Isolde-----	Mixed, mesic Typic Torripsamments
Itca-----	Clayey-skeletal, montmorillonitic, frigid Lithic Argixerolls
Itme-----	Sandy-skeletal, mixed, mesic Typic Torriorthents
Izo-----	Sandy-skeletal, mixed, mesic Typic Torriorthents
Jeness Family-----	Coarse-loamy, mixed, nonacid, mesic Xeric Torriorthents
Jetcop-----	Clayey, mixed, mesic, shallow Xerollic Durargids
Karpp Family-----	Loamy-skeletal, mixed, mesic, shallow Xerollic Durorthids
Katyblay-----	Loamy-skeletal, mixed Andeptic Cryoboralfs
Kawich Family-----	Mixed, mesic Typic Torripsamments
Kiote-----	Loamy-skeletal, mixed Argic Pachic Cryoborolls
Koyen-----	Coarse-loamy, mixed, mesic Typic Camborthids
Kyler-----	Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents
Langston Family-----	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Xerollic Haplargids
Lathrop-----	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Duric Haplargids
Lazan-----	Sandy-skeletal, mixed, mesic, shallow Typic Xerorthents
Lazan Family-----	Sandy-skeletal, mixed, mesic, shallow Typic Xerorthents
Lithic xerorthents-----	Lithic Xerorthents
Logring-----	Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents
Lomcine-----	Loamy-skeletal, mixed (calcareous), mesic Lithic Xeric Torriorthents
Loomer-----	Clayey-skeletal, montmorillonitic, mesic Lithic Argixerolls
Luning-----	Sandy, mixed, mesic Typic Torriorthents
Madeline Family-----	Clayey, montmorillonitic, frigid Lithic Argixerolls
Merino Family-----	Loamy-skeletal, mixed, nonacid Lithic Cryorthents
Mickey-----	Loamy, mixed, mesic, shallow Haploxerollic Durargids
Mirkwood-----	Loamy-skeletal, mixed, mesic Lithic Haplargids
Mopana-----	Clayey, montmorillonitic, frigid, shallow Abruptic Aridic Durixerolls
Nemico-----	Clayey, montmorillonitic, mesic, shallow Typic Nadurargids
Nire-----	Loamy-skeletal over clayey, mixed Argic Pachic Cryoborolls
Nuahs-----	Coarse-loamy, mixed, mesic Typic Calciorthids
Nupart-----	Sandy-skeletal, mixed, frigid, shallow Entic Haploxerolls
Nuyobe-----	Fine-silty, mixed (calcareous), mesic Aeric Halaquepts
Old Camp-----	Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids
Oricto-----	Sandy-skeletal, mixed, mesic Typic Haplargids
Patna-----	Coarse-loamy, mixed, mesic Typic Haplargids
Pedee Variant-----	Clayey-skeletal, mixed, frigid Mollic Palexeralfs
Penelas-----	Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids
Perazzo-----	Loamy-skeletal, mixed, mesic Typic Haplargids
Petspring-----	Loamy-skeletal, mixed, nonacid, mesic, shallow Xeric Torriorthents
Pintwater-----	Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents
Powment-----	Sandy-skeletal, mixed, frigid, shallow Typic Xerorthents
Pumel-----	Loamy-skeletal, mixed (calcareous), mesic, shallow Typic Torriorthents
Rattleflat-----	Coarse-loamy, mixed, mesic Xerollic Haplargids
Ratto Family-----	Clayey, montmorillonitic, frigid, shallow Xerollic Durargids
Ravenell-----	Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids
Ravenswood-----	Clayey-skeletal, montmorillonitic, frigid Typic Argixerolls
Rawe-----	Clayey over loamy-skeletal, montmorillonitic, mesic Typic Haplargids
Rednik-----	Loamy-skeletal, mixed, mesic Typic Haplargids
Reese Family-----	Fine-loamy, mixed (calcareous), mesic Aeric Halaquepts
Rockabin-----	Loamy-skeletal, mixed Typic Cryoborolls
Rodad-----	Loamy-skeletal, mixed, mesic, shallow Typic Haplargids
Roi-----	Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents
Rowel-----	Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids
Sagouspe-----	Sandy, mixed, mesic Aquic Xerofluvents
Sheeprock Family-----	Sandy-skeletal, mixed, mesic Xeric Torriorthents
Silverbow-----	Loamy-skeletal, mixed, mesic, shallow Typic Durargids
Singatse-----	Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents
Slaw-----	Fine-silty, mixed (calcareous), mesic Typic Torrifluvents
Smedley-----	Clayey, montmorillonitic, mesic, shallow Haplic Durargids

TABLE 6.--CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
Snopoc-----	Loamy-skeletal, mixed Pachic Cryoborolls
Sodaspring-----	Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents
*Sonoma-----	Fine-silty, mixed (calcareous), mesic Aeric Fluvaquents
Squawtip-----	Loamy-skeletal, mixed, frigid Typic Argixerolls
Stewal-----	Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids
Stumble-----	Mixed, mesic Typic Torripsamments
Sundown-----	Mixed, mesic Typic Torripsamments
Teguro-----	Loamy, mixed, frigid Lithic Argixerolls
Tejabe-----	Loamy-skeletal, mixed, nonacid, mesic Lithic Xeric Torriorthents
Terlco-----	Fine-loamy, mixed, mesic Typic Natrargids
Tert-----	Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents
Theon-----	Loamy-skeletal, mixed, mesic Lithic Haplargids
Theriot-----	Loamy-skeletal, carbonatic, mesic Lithic Torriorthents
Toney Family-----	Fine, montmorillonitic, frigid Xerollic Paleargids
Tornillo Variant-----	Fine-loamy, mixed, mesic Fluventic Camborthids
Trocken-----	Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents
Troutville Variant-----	Loamy-skeletal, mixed Psammentic Cryoboralfs
Truhoy-----	Loamy, mixed, mesic, shallow Entic Durorthids
Truvar-----	Loamy, mixed, mesic, shallow Haploxerollic Durorthids
Typic Cryorthents-----	Typic Cryorthents
Typic Torriorthents-----	Typic Torriorthents
Unsel-----	Fine-loamy, mixed, mesic Duric Haplargids
Uripnes-----	Loamy-skeletal, mixed, nonacid, mesic, shallow Typic Torriorthents
Veet-----	Loamy-skeletal, mixed, mesic Xerollic Camborthids
Venable Family-----	Fine-loamy, mixed Cumulic Cryaquolls
Veta-----	Loamy-skeletal, mixed, mesic Xerollic Camborthids
Vinini Family-----	Loamy-skeletal, mixed, frigid, shallow Xerollic Durargids
Wabuska-----	Coarse-loamy, mixed (calcareous), mesic Aeric Halaquepts
Wardenot-----	Sandy-skeletal, mixed, mesic Typic Torriorthents
Wassit-----	Loamy-skeletal, mixed, frigid Lithic Mollic Haploxeralfs
Watoopah Family-----	Coarse-loamy, mixed, mesic Durixerollic Haplargids
*Wedlar-----	Fine-loamy, mixed, mesic Durixerollic Haplargids
Wellsed-----	Fine-loamy, mixed, mesic Xerollic Durargids
Whilphang-----	Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents
Wiskiflat-----	Loamy-skeletal, mixed, nonacid, mesic Xeric Torriorthents
Wrango-----	Sandy-skeletal, mixed, mesic Xeric Torriorthents
Zadvar-----	Loamy, mixed, mesic, shallow Haploxerollic Durargids
Zyzzzi-----	Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids



# **Rangeland Plants and Woodland Understory**

## 202--Tornillo Variant fine sandy loam, 0 to 4 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions
		Soil name
		Tornillo Variant
Basin wildrye	ELCI2	60-80
Western wheatgrass	AGSM	5-10
Other perennial grasses	PPGG	2- 5
Perennial forbs	PPFF	5-10
Basin big sagebrush	ARTRT	10-20
Anderson peachbrush	PRAN2	5-15
Rubber rabbitbrush	CHNA2	5-10
Other shrubs	SSSS	2- 5
Range site number		027X003N
Potential production (lb/acre):		
Favorable years		2,500
Normal years		1,900
Unfavorable years		1,200

203--Toney Family, 2 to 8 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Toney Family	
Pine bluegrass	POSC	10-20	
Thurber needlegrass	STTH2	5-15	
Sandberg bluegrass	POSE	5-10	
Other perennial grasses	PPGG	5-10	
Perennial forbs	PPFF	5-10	
Low sagebrush	ARAR8	25-35	
Other shrubs	SSSS	5-10	
Range site number		O27X020N	
Potential production (lb/acre):			
Favorable years		400	
Normal years		200	
Unfavorable years		100	

## 205--Pedee Variant sand, 2 to 15 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Pedee Variant	
Western needlegrass	STOC2	25-40	
Basin wildrye	ELCI2	10-20	
Sandberg bluegrass	POSE	2- 5	
Bottlebrush squirreltail	SIHY	2- 5	
Other perennial grasses	PPGG	5-10	
Annual forbs	AAFF	1- 5	
Perennial forbs	PPFF	5-15	
Wyoming big sagebrush	ARTRW	5-15	
Antelope bitterbrush	PUTR2	5-10	
Other shrubs	SSSS	5-10	
Range site number		026X010N	
Potential production (lb/acre):			
Favorable years		900	
Normal years		700	
Unfavorable years		600	

206--Bombadil-Acana Families association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Bombadil Family	Acana Family
Pine bluegrass	POSC	10-20	---
Thurber needlegrass	STH2	5-15	---
Sandberg bluegrass	POSE	5-10	---
Galleta	HIJA	---	5-25
Indian ricegrass	ORHY	---	5-15
Needlegrass	STIPA	---	5-15
Dropseed	SPORO	---	5-10
Bottlebrush squirreltail	SIHY	---	1- 5
Other perennial grasses	PPGG	5-10	5-20
Annual grasses	AAGG	---	1- 5
Perennial forbs	PPFF	5-10	3-10
Annual forbs	AAFF	---	2- 5
Low sagebrush	ARAR8	25-35	---
Wyoming big sagebrush	ARTRW	---	15-20
Spiny hopsage	GRSP	---	5-10
Bud sagebrush	ARSP5	---	5-10
Winterfat	EULA5	---	2-10
Other shrubs	SSSS	5-10	10-20
Range site number		027X020N	029X049N
Potential production (lb/acre):			
Favorable years		400	900
Normal years		200	600
Unfavorable years		100	300

## 207--Bulake Family, 8 to 30 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Bulake Family	
Pine bluegrass	POSC		X
Bottlebrush squirreltail	SIHY		X
Other perennial grasses	PPGG		X
Perennial forbs	PPFF		X
Wyoming big sagebrush	ARTRW		X
Mountain big sagebrush	ARTRV		X
Green ephedra	EPVI		X
Other shrubs	SSSS		X
Singleleaf pinyon	PIMO		X
Utah juniper	JUOS		X
Range site number		026X062N	
Potential production (lb/acre):			
Favorable years		250	
Normal years		200	
Unfavorable years		150	

208--Bregar Family, 2 to 15 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Bregar Family	
Indian ricegrass	ORHY		X
Needleandthread	STCO4		X
Other perennial grasses	PPGG		X
Perennial forbs	PPFF		X
Wyoming big sagebrush	ARTRW		X
Douglas rabbitbrush	CHVI8		X
Other shrubs	SSSS		X
Utah juniper	JUOS		X

Range site number 026X063N

Potential production (lb/acre):

Favorable years	300
Normal years	150
Unfavorable years	75

## 211--Langston-Karpp Families association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Langston Family	Karpp Family
Galleta	HIJA	5-25	---
Indian ricegrass	ORHY	5-15	X
Needlegrass	STIPA	5-15	---
Dropseed	SPORO	5-10	---
Bottlebrush squirreltail	SIHY	1- 5	---
Needleandthread	STCO4	---	X
Other perennial grasses	PPGG	5-20	X
Annual grasses	AAGG	1- 5	X
Perennial forbs	PPFF	3-10	X
Annual forbs	AAFF	2- 5	---
Wyoming big sagebrush	ARTRW	15-20	X
Spiny hopsage	GRSP	5-10	---
Bud sagebrush	ARSP5	5-10	---
Winterfat	EULA5	2-10	---
Other shrubs	SSSS	10-20	X
Utah juniper	JUOS	---	X
Range site number		029X049N	026X063N
Potential production (lb/acre):			
Favorable years		900	300
Normal years		600	150
Unfavorable years		300	75

213--Ratto-Vinini Families association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Ratto Family	Vinini Family
Galleta	HIJA	15-20	---
Indian ricegrass	ORHY	5-10	---
Needleandthread	STCO4	5-10	---
Thurber needlegrass	STTH2	---	X
Ricegrass	ORYZO	---	X
Bottlebrush squirreltail	SIHY	---	X
Other perennial grasses	PPGG	2-10	X
Perennial forbs	PFFF	5-10	X
Low sagebrush	ARAR8	20-30	X
Nevada ephedra	EPNE	2- 5	---
Antelope bitterbrush	PUTR2	---	X
Green ephedra	EPVI	---	X
Other shrubs	SSSS	5-15	X
Range site number		027X049N	026X064N
Potential production (lb/acre):			
Favorable years		500	325
Normal years		350	225
Unfavorable years		200	150

## 214--Watoopah Family, 2 to 8 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Watoopah Family	
Galleta	HIJA	5-25	
Indian ricegrass	ORHY	5-15	
Needlegrass	STIPA	5-15	
Dropseed	SPORO	5-10	
Bottlebrush squirreltail	SIHY	1- 5	
Other perennial grasses	PPGG	5-20	
Annual grasses	AAGG	1- 5	
Perennial forbs	PPFF	3-10	
Annual forbs	AAFF	2- 5	
Wyoming big sagebrush	ARTRW	15-20	
Spiny hopsage	GRSP	5-10	
Bud sagebrush	ARSP5	5-10	
Winterfat	EULA5	2-10	
Other shrubs	SSSS	10-20	
Range site number		029X049N	
Potential production (lb/acre):			
Favorable years		900	
Normal years		600	
Unfavorable years		300	

216--Merino Family, 30 to 50 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions
		Soil name
		Merino Family
Letterman needlegrass	STLE4	10-25
Bluegrass	POA++	5-10
Prairie junegrass	KOCR	2- 5
Other perennial grasses	PPGG	10-15
Perennial forbs	PPFF	5-15
Low sagebrush	ARAR8	20-30
Other shrubs	SSSS	5-15
Range site number		026X028N
Potential production (lb/acre):		
Favorable years		350
Normal years		250
Unfavorable years		150

## 218--Ratto-Borealis Families association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Ratto Family	Borealis Family
Galleta	HIJA	15-25	---
Indian ricegrass	ORHY	5-10	X
Needleandthread	STCO4	5-10	---
Western needlegrass	STOC2	---	X
Pine bluegrass	POSC	---	X
Bottlebrush squirreltail	SIHY	---	X
Other perennial grasses	PPGG	2-10	X
Perennial forbs	PPFF	5-10	X
Low sagebrush	ARAR8	20-30	---
Nevada ephedra	EPNE	2- 5	---
Mountain big sagebrush	ARTRV	---	X
Antelope bitterbrush	PUTR2	---	X
Green ephedra	EPVI	---	X
Other shrubs	SSSS	5-15	X
Singleleaf pinyon	PIMO	---	X
Utah juniper	JUOS	---	X
Range site number		027X049N	026X060N
Potential production (lb/acre):			
Favorable years		500	300
Normal years		350	225
Unfavorable years		200	150

301--Lazan Family-Powment association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Lazan Family	Powment
Desert needlegrass	STSP3	X	---
Indian ricegrass	ORHY	X	X
Western needlegrass	STOC2	---	X
Bottlebrush squirreltail	SIHY	---	X
Other perennial grasses	PPGG	X	X
Perennial forbs	PPFF	X	X
Wyoming big sagebrush	ARTRW	X	---
Douglas rabbitbrush	CHV18	X	---
Mountain big sagebrush	ARTRV	---	X
Antelope bitterbrush	PUTR2	---	X
Green ephedra	EPVI	---	X
Other shrubs	SSSS	X	X
Singleleaf pinyon	PIMO	X	X
Utah juniper	JUOS	X	X

Range site number	026X061N	026X060N
Potential production (lb/acre):		
Favorable years	225	300
Normal years	200	225
Unfavorable years	150	150

## 302--Jenness Family, 0 to 4 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Jenness Family	
Galleta	HIJA	5-25	
Indian ricegrass	ORHY	5-15	
Needlegrass	STIPA	5-15	
Dropseed	SPORO	5-10	
Bottlebrush squirreltail	SIHY	1- 5	
Other perennial grasses	PPGG	5-20	
Annual grasses	AAGG	1- 5	
Perennial forbs	PPFF	3-10	
Annual forbs	AAFF	2- 5	
Wyoming big sagebrush	ARTRW	15-20	
Spiny hopsage	GRSP	5-10	
Bud sagebrush	ARSP5	5-10	
Winterfat	EULA5	2-10	
Other shrubs	SSSS	10-20	
Range site number		O29X049N	
Potential production (lb/acre):			
Favorable years		900	
Normal years		600	
Unfavorable years		300	

304--Reese Family-Tornillo Variant-Kawich Family association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		
		Reese Family	Tornillo Variant	Kawich Family
Inland saltgrass	DIST	5-10	---	---
Basin wildrye	ELCI2	---	60-80	---
Western wheatgrass	AGSM	---	5-10	---
Indian ricegrass	ORHY	---	---	10-20
Needleandthread	STCO4	---	---	5-10
Other perennial grasses	PPGG	5-15	2- 5	2- 5
Perennial forbs	PPFF	3- 7	5-10	2- 5
Annual forbs	AAFF	---	---	2- 5
Black greasewood	SAVE4	40-60	---	10-40
Shadscale	ATCO	2-10	---	---
Seepweed	SUAED	2- 5	---	---
Basin big sagebrush	ARTRT	---	10-20	---
Anderson peachbrush	PRAN2	---	5-15	---
Rubber rabbitbrush	CHNA2	---	5-10	---
Other shrubs	SSSS	5-15	2- 5	5-20

Range site number	027X025N	027X003N	027X016N
Potential production (lb/acre):			
Favorable years	400	2,500	300
Normal years	200	1,900	200
Unfavorable years	50	1,200	50

## 305--Sheeprock Family, 4 to 30 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Sheeprock Family	
Galleta	HIJA	5-25	
Indian ricegrass	ORHY	5-15	
Needlegrass	STIPA	5-15	
Dropseed	SPORO	5-10	
Bottlebrush squirreltail	SIHY	1- 5	
Other perennial grasses	PPGG	5-20	
Annual grasses	AAGG	1- 5	
Perennial forbs	PPFF	3-10	
Annual forbs	AAFF	2- 5	
Wyoming big sagebrush	ARTRW	15-20	
Spiny hopsage	GRSP	5-10	
Bud sagebrush	ARSP5	5-10	
Winterfat	EULA5	2-10	
Other shrubs	SSSS	10-20	
Range site number		029X049N	
Potential production (lb/acre):			
Favorable years		900	
Normal years		600	
Unfavorable years		300	

306--Baldy Variant silt loam, 0 to 4 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Baldy Variant	
Letterman needlegrass	STLE4	15-25	
Mat muhly	MURI	10-20	
Western wheatgrass	AGSM	5-10	
Other perennial grasses	PPGG	5-15	
Perennial forbs	PPFF	5-10	
Silver sagebrush	ARCA13	15-25	
Other shrubs	SSSS	5-15	

Range site number 026X049N

Potential production (lb/acre):  
 Favorable years 700  
 Normal years 550  
 Unfavorable years 400

## 307--Jenness Family-Fadoll association

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Jenness Family	Fadoll
Galleta	HIJA	5-25	5-25
Indian ricegrass	ORHY	5-15	5-15
Needlegrass	STIPA	5-15	5-15
Dropseed	SPORO	5-10	5-10
Bottlebrush squirreltail	SIHY	1- 5	1- 5
Other perennial grasses	PPGG	5-20	5-20
Annual grasses	AAGG	1- 5	1- 5
Perennial forbs	PPFF	3-10	3-10
Annual forbs	A AFF	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20
Spiny hopsage	GRSP	5-10	5-10
Bud sagebrush	ARSP5	5-10	5-10
Winterfat	EULA5	2-10	2-10
Other shrubs	SSSS	10-20	10-20
Range site number		029X049N	029X049N
Potential production (lb/acre):			
Favorable years		900	900
Normal years		600	600
Unfavorable years		300	300

502--Hapgood Family, 4 to 15 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Hapgood Family	
Western needlegrass	STOC2		20-40
Basin wildrye	ELCI2		5-15
Mountain brome	BRMA4		5-10
Other perennial grasses	PPGG		5-15
Perennial forbs	PPFF		10-20
Annual forbs	AAFF		5-10
Mountain big sagebrush	ARTRV		10-20
Eriogonum	ERIOG		5-10
Other shrubs	SSSS		5-10

Range site number 026X038N

Potential production (lb/acre):

Favorable years	1,500
Normal years	900
Unfavorable years	600

## 504--Coutis Family, 15 to 50 percent slopes

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Coutis Family	
Pine bluegrass	POSC	5-10	
Basin wildrye	ELCI2	2- 5	
Other perennial grasses	PPGG	2-10	
Arrowleaf balsamroot	BASA3	2- 5	
Other perennial forbs	PPFF	2-10	
Curleaf mountainmahogany	CELE3	45-65	
Mountain big sagebrush	ARTRV	2- 5	
Snowberry	SYMPH	2- 5	
Other shrubs	SSSS	2-10	
Range site number		026X009N	
Potential production (lb/acre):			
Favorable years		1,000	
Normal years		800	
Unfavorable years		600	

505--Madeline-Bulake Families association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Madeline Family	Bulake Family
Western needlegrass	STOC2	X	---
Pine bluegrass	POSC	X	---
Indian ricegrass	ORHY	X	---
Bottlebrush squirreltail	SIHY	X	X
Thurber needlegrass	STTH2	---	X
Ricegrass	ORYZO	---	X
Other perennial grasses	PPGG	X	X
Perennial forbs	PPFF	X	X
Mountain big sagebrush	ARTRV	X	---
Antelope bitterbrush	PUTR2	X	X
Green ephedra	EPVI	X	X
Low sagebrush	ARAR8	---	X
Other shrubs	SSSS	X	X
Singleleaf pinyon	PIMO	X	X
Utah juniper	JUOS	X	X

Range site number	026X060N	026X064N
Potential production (lb/acre):		
Favorable years	300	325
Normal years	225	225
Unfavorable years	150	150

## 507--Clanalpine Family, 15 to 50 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Clanalpine Family	
Western needlegrass	STOC2		X
Pine bluegrass	POSC		X
Indian ricegrass	ORHY		X
Bottlebrush squirreltail	SIHY		X
Other perennial grasses	PPGG		X
Perennial forbs	PPFF		X
Mountain big sagebrush	ARTRV		X
Antelope bitterbrush	PUTR2		X
Green ephedra	EPVI		X
Other shrubs	SSSS		X
Singleleaf pinyon	PIMO		X
Utah juniper	JUOS		X

Range site number

026X060N

Potential production (lb/acre):

Favorable years	300
Normal years	225
Unfavorable years	150

902--Lava flows-Lithic Xerorthents complex, 2 to 8 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	
		Lithic Xerorthents	
Western needlegrass	STOC2		X
Pine bluegrass	POSC		X
Indian ricegrass	ORHY		X
Bottlebrush squirreltail	SIHY		X
Other perennial grasses	PPGG		X
Perennial forbs	PPFF		X
Mountain big sagebrush	ARTRV		X
Antelope bitterbrush	PUTR2		X
Green ephedra	EPVI		X
Other shrubs	SSSS		X
Singleleaf pinyon	PIMO		X
Utah juniper	JUOS		X

Range site number 026X060N

Potential production (lb/acre):

Favorable years 300  
 Normal years 225  
 Unfavorable years 150

1032--Goldyke-Trocken association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Goldyke	Trocken	1	2	3	4
Galleta	HIJA	5-20	---	---	---	---	---
Indian ricegrass	ORHY	5-15	10-20	10-20	2- 5	5-10	---
Needlegrass	STIPA	5-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	2- 5	5-10	5-10	1- 2	---	---
King desertgrass	BLKI	---	---	---	1- 2	---	---
Other perennial grasses	PPGG	5-10	5-10	5-10	1- 5	5-10	---
Annual grasses	AAGG	1- 5	---	---	1- 5	2- 4	---
Perennial forbs	PPFF	5-10	3- 7	3- 7	2- 5	2- 6	---
Annual forbs	AAFF	2- 5	2- 5	2- 5	1- 5	1- 5	---
Shadscale	ATCO	15-25	15-30	15-30	40-60	---	---
Bailey greasewood	SAVEB	5-15	10-20	10-20	10-15	2-10	---
Nevada ephedra	EPNE	2- 5	---	---	---	2- 5	---
Bud sagebrush	ARSP5	2- 5	5-15	5-15	2- 5	---	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Other shrubs	SSSS	10-20	5-10	5-10	5-15	10-20	---

Range site number	029X022N	027X018N	027X018N	029X033N	029X041N	None
Potential production (lb/acre):						
Favorable years	300	500	500	100	500	---
Normal years	200	300	300	50	300	---
Unfavorable years	100	100	100	25	100	---

1033--Golddyke-Blacktop-Koyen association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Golddyke	Blacktop	Koyen	1	2	3	4
Galleta	HIJA	5-20	---	5-20	10-25	10-25	---	---
Indian ricegrass	ORHY	5-15	2- 5	5-10	5-10	5-10	---	---
Needlegrass	STIPA	5-10	---	2- 5	2- 5	2- 5	---	---
Bottlebrush squirreltail	SIHY	2- 5	1- 2	---	2- 5	2- 5	---	---
King desertgrass	BLKI	---	1- 2	---	---	---	---	---
Dropseed	SPORO	---	---	5-15	2- 5	2- 5	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	1- 5	5-10	5-15	5-15	---	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	---	---
Perennial forbs	PPFF	5-10	2- 5	5- 7	4-10	4-10	---	2- 5
Annual forbs	AAFF	2- 5	1- 5	2- 4	1- 5	1- 5	---	2- 5
Shadscale	ATCO	15-25	40-60	---	10-25	10-25	---	---
Bailey greasewood	SAVEB	5-15	10-15	---	5-10	5-10	---	---
Nevada ephedra	EPNE	2- 5	---	---	1- 5	1- 5	---	---
Bud sagebrush	ARSP5	2- 5	2- 5	5-10	5-10	5-10	---	---
Nevada dalea	DAPO2	---	5-10	---	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---	---	---
Fourwing saltbush	ATCA2	---	---	10-15	---	---	---	---
Winterfat	EULA5	---	---	5-20	5-10	5-10	---	---
Spiny hopsage	GRSP	---	---	2- 8	---	---	---	10-20
Anderson wolfberry	LYAN	---	---	1- 5	---	---	---	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	5-15	10-25	10-20	10-20	---	5-15

Range site number	029X022N	029X003N	029X046N	029X017N	029X017N	None	027X029N
Potential production (lb/acre):							
Favorable years	300	100	450	350	350	---	800
Normal years	200	50	350	250	250	---	500
Unfavorable years	100	25	175	100	100	---	100

1040--Isolde-Hawsley association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Isolde	Hawsley	1	2
Indian ricegrass	ORHY	15-25	30-50	5-10	30-50
Needleandthread	STCO4	10-15	2-10	---	---
Bottlebrush squirreltail	SIHY	---	---	2-10	---
Other perennial grasses	PPGG	---	2-10	5-10	2- 5
Globemallow	SPHAE	---	---	---	1- 3
Birdcage eveningprimrose	OEDE2	---	---	---	1- 3
Other perennial forbs	PFFF	2- 5	2- 5	2- 5	2- 5
Annual forbs	AAFF	2- 5	2- 5	5-15	---
Hairy horsebrush	TECO2	30-40	---	---	---
Fourwing saltbush	ATCA2	10-20	5-15	5-10	15-30
Nevada dalea	DAPO2	5-10	2-10	---	5-10
Littleleaf horsebrush	TEGL	5-10	---	5-25	---
Winterfat	EULA5	---	2-10	---	---
Rubber rabbitbrush	CHNA2	---	---	5-20	---
Bailey greasewood	SAVEB	---	---	5-20	---
Spiny hopsage	GRSP	---	---	5-20	---
Burrobrush	HYMEN3	---	---	5-10	---
Nevada ephedra	EPNE	---	---	2- 5	---
Black greasewood	SAVE4	---	---	2- 5	---
Cooper wolfberry	LYCO2	---	---	---	10-20
Other shrubs	SSSS	5-10	5-10	2- 5	5-15
Range site number		027X023N	027X009N	027X022N	027X060N
Potential production (lb/acre):					
Favorable years		300	800	400	400
Normal years		200	450	200	200
Unfavorable years		100	200	50	100

1041--Isolde-Playas-Wabuska association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Isolde	Playas	Wabuska	1	2
Indian ricegrass	ORHY	10-20	---	---	5-10	---
Needleandthread	STCO4	5-10	---	---	---	---
Inland saltgrass	DIST	---	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	---	---	2- 5	5-10
Basin wildrye	ELCI2	---	---	---	---	15-25
Alkali sacaton	SPAI	---	---	---	---	5-10
Other perennial grasses	PPGG	2- 5	---	5-15	2- 5	5-10
Perennial forbs	PPFF	2- 5	---	3- 7	5-10	5-10
Annual forbs	AAFF	2- 5	---	---	---	2- 5
Black greasewood	SAVE4	10-40	---	40-60	30-40	5-15
Shadscale	ATCO	---	---	2-10	10-20	2- 5
Seepweed	SUAED	---	---	2- 5	---	---
Cooper wolfberry	LYCO2	---	---	---	5-15	---
Torrey quailbush	ATTO	---	---	---	---	40-60
Fourwing saltbush	ATCA2	---	---	---	---	2- 5
Other shrubs	SSSS	5-20	---	5-15	2- 5	5-10
Range site number		027X016N	None	027X025N	027X036N	027X041N
Potential production (lb/acre):						
Favorable years		300	---	400	200	1,500
Normal years		200	---	200	100	1,000
Unfavorable years		50	---	50	50	600

1042--Isolde-Dune land association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Isolde	Dune land	1	2	3	4
Indian ricegrass	ORHY	15-25	---	30-50	30-50	10-20	---
Needleandthread	STCO4	10-15	---	2-10	---	---	---
Bottlebrush squirreltail	SIHY	---	---	1- 5	1- 3	5-10	---
Birdcage eveningprimrose	OEDE2	---	---	---	1- 3	---	---
Other perennial forbs	PFFF	2- 5	---	2- 5	2- 5	3- 7	---
Annual forbs	AAFF	2- 5	---	2- 5	---	2- 5	---
Hairy horsebrush	TECO2	30-40	---	---	---	---	---
Fourwing saltbush	ATCA2	10-20	---	5-15	15-30	---	---
Nevada dalea	DAPO2	5-10	---	2-10	5-10	---	---
Littleleaf horsebrush	TEGL	5-10	---	---	---	---	---
Winterfat	EULA5	---	---	2-10	---	---	---
Cooper wolfberry	LYCO2	---	---	---	10-20	5-20	---
Shadscale	ATCO	---	---	---	---	10-20	---
Bailey greasewood	SAVEB	---	---	---	---	5-10	---
Other shrubs	SSSS	5-10	---	5-10	5-15	5-15	---
Range site number		027X023N	None	027X009N	027X060N	027X043N	None
Potential production (lb/acre):							
Favorable years		300	---	800	400	400	---
Normal years		200	---	450	200	200	---
Unfavorable years		100	---	200	100	100	---

1043--Isolde-Cirac-Playas association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name			Inclusion number--
		Isolde	Cirac	Playas	
					1
Indian ricegrass	ORHY	10-20	---	---	---
Needleandthread	STCO4	5-10	---	---	---
Inland saltgrass	DIST	---	5-10	---	5-10
Other perennial grasses	PPGG	2- 5	5-15	---	5-15
Perennial forbs	PPFF	2- 5	3- 7	---	3- 7
Annual forbs	AAFF	2- 5	---	---	---
Black greasewood	SAVE4	10-40	40-60	---	40-60
Shadscale	ATCO	---	2-10	---	2-10
Seepweed	SUAED	---	2- 5	---	2- 5
Other shrubs	SSSS	5-20	5-15	---	5-15
Range site number		027X016N	027X025N	None	027X025N
Potential production (lb/acre):					
Favorable years		300	400	---	400
Normal years		200	200	---	200
Unfavorable years		50	50	---	50

1044--Isolde-Patna-Hawsley association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Isolde	Patna	Hawsley	1	2	3	4
Indian ricegrass	ORHY	10-20	10-20	30-50	---	10-20	15-25	---
Needleandthread	STCO4	5-10	---	2-10	---	---	10-15	---
Bottlebrush squirreltail	SIHY	---	5-10	---	---	5-10	---	---
Inland saltgrass	DIST	---	---	---	5-10	---	---	---
Other perennial grasses	PPGG	2- 5	5-10	2-10	5-15	5-10	---	---
Perennial forbs	PPFF	2- 5	3- 7	2- 5	3- 7	3- 7	2- 5	---
Annual forbs	AAFF	2- 5	2- 5	2- 5	---	2- 5	2- 5	---
Black greasewood	SAVE4	10-40	---	---	40-60	---	---	---
Shadscale	ATCO	---	15-30	---	2-10	10-20	---	---
Bailey greasewood	SAVEB	---	10-20	---	---	5-10	---	---
Bud sagebrush	ARSP5	---	5-15	---	---	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	10-20	---
Winterfat	EULA5	---	---	2-10	---	---	---	---
Nevada dalea	DAPO2	---	---	2-10	---	---	5-10	---
Seepweed	SUAED	---	---	---	2- 5	---	---	---
Cooper wolfberry	LYCO2	---	---	---	---	5-20	---	---
Hairy horsebrush	TECO2	---	---	---	---	---	30-40	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-10	---
Other shrubs	SSSS	5-20	5-10	5-10	5-15	5-15	5-10	---

Range site number	027X016N	027X018N	027X009N	027X025N	027X043N	027X023N	None
Potential production (lb/acre):							
Favorable years	300	500	800	400	400	300	---
Normal years	200	300	450	200	200	200	---
Unfavorable years	50	100	200	50	100	100	---

1072--Rednik-Trocken-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Rednik	Trocken	Bluewing	1	2	3	4
Indian ricegrass	ORHY	10-20	10-20	10-20	10-20	5-15	5-10	30-50
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	5-10	2- 5	2-10	---
Galleta	HIJA	---	---	---	---	5-20	---	---
Needlegrass	STIPA	---	---	---	---	5-10	---	---
Needleandthread	STCO4	---	---	---	---	---	---	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-10	2-10
Annual grasses	AAGG	---	---	---	---	1- 5	---	---
Perennial forbs	PPFF	3- 7	3- 7	3- 7	3- 7	5-10	2- 5	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	2- 5	5-15	2- 5
Shadscale	ATCO	15-30	15-30	15-30	15-30	15-25	---	---
Bailey greasewood	SAVEB	10-20	10-20	10-20	10-20	5-15	5-20	---
Bud sagebrush	ARSP5	5-15	5-15	5-15	5-15	2- 5	---	---
Nevada ephedra	EPNE	---	---	---	---	2- 5	2- 5	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-25	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	5-20	---
Spiny hopsage	GRSP	---	---	---	---	---	5-20	---
Burrobrush	HYMEN3	---	---	---	---	---	5-10	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-10	5-15
Black greasewood	SAVE4	---	---	---	---	---	2- 5	---
Winterfat	EULA5	---	---	---	---	---	---	2-10
Nevada dalea	DAPO2	---	---	---	---	---	---	2-10
Other shrubs	SSSS	5-10	5-10	5-10	5-10	10-20	2- 5	5-10

Range site number	027X018N	027X018N	027X018N	027X018N	029X022N	027X022N	027X009N
Potential production (lb/acre):							
Favorable years	500	500	500	500	300	400	800
Normal years	300	300	300	300	200	200	450
Unfavorable years	100	100	100	100	100	50	200

1090--Singatse-Theon-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Singatse	Theon	Rock outcrop	1	2	3
Indian ricegrass	ORHY	5-20	5-15	---	5-15	10-20	---
Desert needlegrass	STSP3	2-10	5-15	---	---	---	---
Bottlebrush squirreltail	SIHY	---	2-10	---	2- 5	5-10	---
Galleta	HIJA	---	---	---	5-20	---	---
Needlegrass	STIPA	---	---	---	5-10	---	5-15
Pine bluegrass	POSC	---	---	---	---	---	20-30
Other perennial grasses	PPGG	2- 5	5-10	---	5-10	5-10	5-15
Annual grasses	AAGG	---	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	---	5-10	3- 7	5-10
Annual forbs	AAFF	---	---	---	2- 5	2- 5	---
Shadscale	ATCO	10-20	10-20	---	15-25	15-30	---
Bailey greasewood	SAVEB	5-15	5-10	---	5-15	10-20	---
Bud sagebrush	ARSP5	2-10	5-10	---	2- 5	5-15	---
Nevada ephedra	EPNE	2- 5	---	---	2- 5	---	5-10
Winterfat	EULA5	---	2- 5	---	---	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	10-20
Spiny hopsage	GRSP	---	---	---	---	---	5-15
Other shrubs	SSSS	5-10	2- 5	---	10-20	5-10	5-10

Range site number	027X027N	027X019N	None	029X022N	027X018N	027X007N
Potential production (lb/acre):						
Favorable years	200	350	---	300	500	600
Normal years	100	200	---	200	300	450
Unfavorable years	50	50	---	100	100	300

1091--Singatse-Gynelle-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Singatse	Gynelle	Izo	1	2	3
Indian ricegrass	ORHY	5-20	10-20	5-10	5-15	1-10	30-50
Desert needlegrass	STSP3	2-10	---	---	5-15	---	---
Bottlebrush squirreltail	SIHY	---	5-10	---	2-10	---	---
King desertgrass	BLKI	---	---	---	---	1- 2	---
Needleandthread	STCO4	---	---	---	---	---	2-10
Other perennial grasses	PPGG	2- 5	5-10	5-10	5-10	5-10	2-10
Annual grasses	AAGG	---	---	2- 4	---	1- 5	---
Perennial forbs	PPFF	5-10	3- 7	2- 6	5-10	5-10	2- 5
Annual forbs	AAFF	---	2- 5	1- 5	---	2- 5	2- 5
Shadscale	ATCO	10-20	10-20	---	10-20	20-40	---
Bailey greasewood	SAVEB	5-15	5-10	2-10	5-10	10-15	---
Bud sagebrush	ARSP5	2-10	---	---	5-10	---	---
Nevada ephedra	EPNE	2- 5	---	2- 5	---	---	---
Cooper wolfberry	LYCO2	---	5-20	2- 5	---	5-15	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	5-15
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Winterfat	EULA5	---	---	---	2- 5	---	2-10
Nevada dalea	DAPO2	---	---	---	---	---	2-10
Other shrubs	SSSS	5-10	5-15	10-20	2- 5	5-15	5-10
Range site number		027X027N	027X043N	029X041N	027X019N	029X032N	027X009N
Potential production (lb/acre):							
Favorable years		200	400	500	350	150	800
Normal years		100	200	300	200	100	450
Unfavorable years		50	100	100	50	50	200

## 1094--Singatse-Hawsley association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Singatse	Hawsley	1	2
Indian ricegrass	ORHY	5-20	30-50	---	15-25
Desert needlegrass	STSP3	2-10	---	---	---
Needleandthread	STCO4	---	2-10	---	10-15
Other perennial grasses	PPGG	2- 5	2-10	---	---
Perennial forbs	PPFF	5-10	2- 5	---	2- 5
Annual forbs	AAFF	---	2- 5	---	2- 5
Shadscale	ATCO	10-20	---	---	---
Bailey greasewood	SAVEB	5-15	---	---	---
Bud sagebrush	ARSP5	2-10	---	---	---
Nevada ephedra	EPNE	2- 5	---	---	---
Fourwing saltbush	ATCA2	---	5-15	---	10-20
Winterfat	EULA5	---	2-10	---	---
Nevada dalea	DAPO2	---	2-10	---	5-10
Hairy horsebrush	TECO2	---	---	---	30-40
Littleleaf horsebrush	TEGL	---	---	---	5-10
Other shrubs	SSSS	5-10	5-10	---	5-10
Range site number		027X027N	027X009N	None	027X023N
Potential production (lb/acre):					
Favorable years		200	800	---	300
Normal years		100	450	---	200
Unfavorable years		50	200	---	100

1121--Theon-Old Camp association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Theon	Old Camp	1	2	3
Desert needlegrass	STSP3	5-15	---	---	2-10	---
Bottlebrush squirreltail	SIHY	2-10	---	---	---	---
Indian ricegrass	ORHY	5-15	---	---	5-20	5-15
Pine bluegrass	POSC	---	20-30	---	---	---
Needlegrass	STIPA	---	5-15	---	---	---
Galleta	HIJA	---	---	---	---	30-50
Other perennial grasses	PPGG	5-10	5-15	---	2- 5	5-15
Perennial forbs	PPFF	5-10	5-10	---	5-10	5-10
Shadscale	ATCO	10-20	---	---	10-20	5-15
Bailey greasewood	SAVEB	5-10	---	---	5-15	5-10
Bud sagebrush	ARSP5	5-10	---	---	2-10	---
Winterfat	EULA5	2- 5	---	---	---	---
Wyoming big sagebrush	ARTRW	---	10-20	---	---	---
Spiny hopsage	GRSP	---	5-15	---	---	---
Nevada ephedra	EPNE	---	5-10	---	2- 5	---
Other shrubs	SSSS	2- 5	5-10	---	5-10	5-15
Range site number		027X019N	027X007N	None	027X027N	027X015N
Potential production (lb/acre):						
Favorable years		350	600	---	200	500
Normal years		200	450	---	100	350
Unfavorable years		50	300	---	50	200

## 1127--Theon very gravelly sandy loam, 8 to 30 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Theon	1	2
Desert needlegrass	STSP3	5-15	2-10	---
Bottlebrush squirreltail	SIHY	2-10	---	---
Indian ricegrass	ORHY	5-15	5-20	---
Other perennial grasses	PPGG	5-10	2- 5	---
Perennial forbs	PPFF	5-10	5-10	---
Shadscale	ATCO	10-20	10-20	---
Bailey greasewood	SAVEB	5-10	5-15	---
Bud sagebrush	ARSP5	5-10	2-10	---
Winterfat	EULA5	2- 5	---	---
Nevada ephedra	EPNE	---	2- 5	---
Other shrubs	SSSS	2- 5	5-10	---
Range site number		027X019N	027X027N	None
Potential production (lb/acre):				
Favorable years		350	200	---
Normal years		200	100	---
Unfavorable years		50	50	---

1130--Uripnes-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Uripnes	Rock outcrop	1	2	3
Desert needlegrass	STSP3	20-30	---	---	---	---
Galleta	HIJA	5-10	---	---	---	---
Indian ricegrass	ORHY	2- 5	---	---	2- 5	5-10
Pine bluegrass	POSC	---	---	20-30	---	---
Needlegrass	STIPA	---	---	5-15	---	---
King desertgrass	BLKI	---	---	---	1- 2	---
Bottlebrush squirreltail	SIHY	---	---	---	1- 2	---
Other perennial grasses	PPGG	2- 5	---	5-15	1- 5	5-10
Annual grasses	AAGG	---	---	---	1- 5	2- 4
Perennial forbs	PPFF	2- 5	---	5-10	2- 5	2- 6
Annual forbs	AAFF	---	---	---	1- 5	1- 5
Anderson wolfberry	LYAN	10-20	---	---	---	---
Littleleaf horsebrush	TEGL	10-15	---	---	---	5-10
Nevada ephedra	EPNE	5-10	---	5-10	---	2- 5
Burrobrush	HYMEN3	5-10	---	---	---	5-10
Shadscale	ATCO	2- 5	---	---	40-60	---
Wyoming big sagebrush	ARTRW	---	---	10-20	---	---
Spiny hopsage	GRSP	---	---	5-15	---	---
Bailey greasewood	SAVEB	---	---	---	10-15	2-10
Nevada dalea	DAPO2	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	2- 5
Bud sagebrush	ARSP5	---	---	---	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	5-15
Other shrubs	SSSS	5-10	---	5-10	5-15	10-20

Range site number	027X047N	None	027X007N	029X033N	029X041N
Potential production (lb/acre):					
Favorable years	400	---	600	100	500
Normal years	200	---	450	50	300
Unfavorable years	100	---	300	25	100

## 1131--Uripnes-Budihol-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Uripnes	Budihol	Rock outcrop	1	2
Desert needlegrass	STSP3	20-30	---	---	---	---
Galleta	HIJA	5-10	---	---	---	---
Indian ricegrass	ORHY	2- 5	---	---	---	30-50
Pine bluegrass	POSC	---	20-30	---	---	---
Needlegrass	STIPA	---	5-15	---	---	---
Other perennial grasses	PPGG	2- 5	5-15	---	---	2- 5
Globemallow	SPHAE	---	---	---	---	1- 3
Birdcage eveningprimrose	OEDE2	---	---	---	---	1- 3
Other perennial forbs	PPFF	2- 5	5-10	---	---	2- 5
Anderson wolfberry	LYAN	10-20	---	---	---	---
Littleleaf horsebrush	TEGL	10-15	---	---	---	---
Nevada ephedra	EPNE	5-10	5-10	---	---	---
Burrobrush	HYMEN3	5-10	---	---	---	---
Shadscale	ATCO	2- 5	---	---	---	---
Wyoming big sagebrush	ARTRW	---	10-20	---	---	---
Spiny hopsage	GRSP	---	5-15	---	---	---
Fourwing saltbush	ATCA2	---	---	---	---	15-30
Cooper wolfberry	LYCO2	---	---	---	---	10-20
Nevada dalea	DAPO2	---	---	---	---	5-10
Other shrubs	SSSS	5-10	5-10	---	---	5-15
Range site number		027X047N	027X007N	None	None	027X060N
Potential production (lb/acre):						
Favorable years		400	600	---	---	400
Normal years		200	450	---	---	200
Unfavorable years		100	300	---	---	100

1136--Uripnes-Pumel-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Uripnes	Pumel	Rock outcrop	1	2	3
Desert needlegrass	STSP3	20-30	---	---	---	---	20-40
Galleta	HIJA	5-10	10-20	---	10-20	---	5-15
Indian ricegrass	ORHY	2- 5	2- 5	---	2- 5	5-10	5-10
Needlegrass	STIPA	---	5-10	---	5-10	---	---
Other perennial grasses	PPGG	2- 5	5-10	---	5-10	5-10	5-10
Annual grasses	AAGG	---	1- 5	---	1- 5	2- 4	---
Perennial forbs	PPFF	2- 5	5-10	---	5-10	2- 6	2- 5
Annual forbs	AAFF	---	2- 5	---	2- 5	1- 5	---
Anderson wolfberry	LYAN	10-20	5-10	---	5-10	---	---
Littleleaf horsebrush	TEGL	10-15	---	---	---	5-10	---
Nevada ephedra	EPNE	5-10	5-10	---	5-10	2- 5	5-15
Burrobrush	HYMEN3	5-10	---	---	---	5-10	---
Shadscale	ATCO	2- 5	2- 5	---	2- 5	---	---
Bud sagebrush	ARSP5	---	2- 5	---	2- 5	---	---
Spiny menodora	MESP2	---	10-25	---	10-25	---	---
Bailey greasewood	SAVEB	---	5-10	---	5-10	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	15-25
Spiny hopsage	GRSP	---	---	---	---	---	5-15
Other shrubs	SSSS	5-10	15-25	---	15-25	10-20	5-10
Range site number		027X047N	029X037N	None	029X037N	029X041N	027X065N
Potential production (lb/acre):							
Favorable years		400	300	---	300	500	500
Normal years		200	200	---	200	300	300
Unfavorable years		100	100	---	100	100	200

1138--Uripnes-Petspring-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Uripnes	Petspring	Rock outcrop	1	2
Desert needlegrass	STSP3	20-30	20-40	---	---	---
Galleta	HIJA	5-10	5-15	---	---	10-20
Indian ricegrass	ORHY	2- 5	5-10	---	---	2- 5
Pine bluegrass	POSC	---	---	---	20-30	---
Needlegrass	STIPA	---	---	---	5-15	5-10
Other perennial grasses	PPGG	2- 5	5-10	---	5-15	5-10
Annual grasses	AAGG	---	---	---	---	1- 5
Perennial forbs	PPFF	2- 5	2- 5	---	5-10	5-10
Annual forbs	AAFF	---	---	---	---	2- 5
Anderson wolfberry	LYAN	10-20	---	---	---	5-10
Littleleaf horsebrush	TEGL	10-15	---	---	---	---
Nevada ephedra	EPNE	5-10	5-15	---	5-10	5-10
Burrobrush	HYMEN3	5-10	---	---	---	---
Shadscale	ATCO	2- 5	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	---	15-25	---	10-20	---
Spiny hopsage	GRSP	---	5-15	---	5-15	---
Bud sagebrush	ARSP5	---	---	---	---	2- 5
Spiny menodora	MESP2	---	---	---	---	10-25
Bailey greasewood	SAVEB	---	---	---	---	5-10
Other shrubs	SSSS	5-10	5-10	---	5-10	15-25
Range site number		027X047N	027X065N	None	027X007N	029X037N
Potential production (lb/acre):						
Favorable years		400	500	---	600	300
Normal years		200	300	---	450	200
Unfavorable years		100	200	---	300	100

1139--Uripnes-Zyzzi-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Uripnes	Zyzzi	Rock outcrop	1	2
Desert needlegrass	STSP3	20-30	---	---	---	---
Galleta	HIJA	5-10	15-25	---	15-25	30-50
Indian ricegrass	ORHY	2- 5	5-10	---	5-10	5-15
Needleandthread	STCO4	---	5-10	---	5-10	---
Other perennial grasses	PPGG	2- 5	2-10	---	2-10	5-15
Perennial forbs	PPFF	2- 5	5-10	---	5-10	5-10
Anderson wolfberry	LYAN	10-20	---	---	---	---
Littleleaf horsebrush	TEGL	10-15	---	---	---	---
Nevada ephedra	EPNE	5-10	2- 5	---	2- 5	---
Burrobrush	HYMEN3	5-10	---	---	---	---
Shadscale	ATCO	2- 5	---	---	---	5-15
Low sagebrush	ARAR8	---	20-30	---	20-30	---
Bailey greasewood	SAVEB	---	---	---	---	5-10
Other shrubs	SSSS	5-10	5-15	---	5-15	5-15
Range site number		027X047N	027X049N	None	027X049N	027X015N
Potential production (lb/acre):						
Favorable years		400	500	---	500	500
Normal years		200	350	---	350	350
Unfavorable years		100	200	---	200	200

## 1140--Wabuska-Isolde association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Wabuska	Isolde	1	2
Inland saltgrass	DIST	5-10	---	---	---
Indian ricegrass	ORHY	---	10-20	5-10	1-10
Needleandthread	STCO4	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	---	2- 5	---
King desertgrass	BLKI	---	---	---	1- 2
Other perennial grasses	PPGG	5-15	2- 5	2- 5	5-10
Annual grasses	AAGG	---	---	---	1- 5
Perennial forbs	PPFF	3- 7	2- 5	5-10	5-10
Annual forbs	AAFF	---	2- 5	---	2- 5
Black greasewood	SAVE4	40-60	10-40	30-40	---
Shadscale	ATCO	2-10	---	10-20	20-40
Seepweed	SUAED	2- 5	---	---	---
Cooper wolfberry	LYCO2	---	---	5-15	5-15
Bailey greasewood	SAVEB	---	---	---	10-15
Other shrubs	SSSS	5-15	5-20	2- 5	5-15
Range site number		027X025N	027X016N	027X036N	029X032N
Potential production (lb/acre):					
Favorable years		400	300	200	150
Normal years		200	200	100	100
Unfavorable years		50	50	50	50

1141--Wabuska-Playas-Isolde association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Wabuska	Playas	Isolde	1	2	3
Alkali sacaton	SPAI	20-30	---	---	---	---	---
Inland saltgrass	DIST	10-20	---	---	5-10	---	---
Basin wildrye	ELCI2	5-15	---	---	---	---	---
Creeping wildrye	ELTR3	5-10	---	---	---	---	---
Baltic rush	JUBA	5-10	---	---	---	---	---
Indian ricegrass	ORHY	---	---	10-20	---	5-10	5-10
Needleandthread	STCO4	---	---	5-10	---	---	---
Bottlebrush squirreltail	SIHY	---	---	---	---	2- 5	2-10
Other perennial grasses	PPGG	5-10	---	2- 5	5-15	2- 5	5-10
Perennial forbs	PPFF	5-10	---	2- 5	3- 7	5-10	2- 5
Annual forbs	AAFF	2- 5	---	2- 5	---	---	5-15
Black greasewood	SAVE4	5-10	---	10-40	40-60	30-40	2- 5
Iodinebush	ALOC2	2- 5	---	---	---	---	---
Seepweed	SUAED	2- 5	---	---	2- 5	---	---
Shadscale	ATCO	---	---	---	2-10	10-20	---
Cooper wolfberry	LYCO2	---	---	---	---	5-15	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-25
Rubber rabbitbrush	CHNA2	---	---	---	---	---	5-20
Bailey greasewood	SAVEB	---	---	---	---	---	5-20
Spiny hopsage	GRSP	---	---	---	---	---	5-20
Burrobrush	HYMEN3	---	---	---	---	---	5-10
Fourwing saltbush	ATCA2	---	---	---	---	---	5-10
Nevada ephedra	EPNE	---	---	---	---	---	2- 5
Other shrubs	SSSS	5-10	---	5-20	5-15	2- 5	2- 5
Trees	TTTT	5-10	---	---	---	---	---

Range site number	027X005N	None	027X016N	027X025N	027X036N	027X022N
Potential production (lb/acre):						
Favorable years	2,000	---	300	400	200	400
Normal years	1,500	---	200	200	100	200
Unfavorable years	1,000	---	50	50	50	50

1142--Wabuska-Playas association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Wabuska	Playas	1	2	3
Alkali sacaton	SPAI	20-30	---	2- 5	---	---
Inland saltgrass	DIST	10-20	---	5-10	---	---
Basin wildrye	ELCI2	5-15	---	5-15	---	---
Creeping wildrye	ELTR3	5-10	---	---	---	---
Baltic rush	JUBA	5-10	---	---	---	---
Bottlebrush squirreltail	SIHY	---	---	2- 5	2- 5	---
Indian ricegrass	ORHY	---	---	---	5-10	10-20
Needleandthread	STCO4	---	---	---	---	5-10
Other perennial grasses	PPGG	5-10	---	---	2- 5	2- 5
Perennial forbs	PPFF	5-10	---	2- 5	5-10	2- 5
Annual forbs	AAFF	2- 5	---	---	---	2- 5
Black greasewood	SAVE4	5-10	---	5-15	30-40	10-40
Iodinebush	ALOC2	2- 5	---	2- 5	---	---
Seepweed	SUAED	2- 5	---	2- 5	---	---
Torrey quailbush	ATTO	---	---	50-70	---	---
Shadscale	ATCO	---	---	---	10-20	---
Cooper wolfberry	LYCO2	---	---	---	5-15	---
Other shrubs	SSSS	5-10	---	2- 5	2- 5	5-2
Trees	TTTT	5-10	---	---	---	---

Range site number	027X005N	None	027X044N	027X036N	027X016N
Potential production (lb/acre):					
Favorable years	2,000	---	600	200	300
Normal years	1,500	---	400	100	200
Unfavorable years	1,000	---	200	50	50

1151--Gynelle very gravelly loamy sand, sodic, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Gynelle	1	2	3
Indian ricegrass	ORHY	5-10	5-10	---	10-20
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---	---
Inland saltgrass	DIST	---	---	5-10	---
Needleandthread	STCO4	---	---	---	5-10
Other perennial grasses	PPGG	2- 5	2- 5	5-15	2- 5
Perennial forbs	PPFF	5-10	5-10	3- 7	2- 5
Annual forbs	AAFF	---	---	---	2- 5
Black greasewood	SAVE4	30-40	30-40	40-60	10-40
Shadscale	ATCO	10-20	10-20	2-10	---
Cooper wolfberry	LYCO2	5-15	5-15	---	---
Seepweed	SUAED	---	---	2- 5	---
Other shrubs	SSSS	2- 5	2- 5	5-15	5-20

Range site number	027X036N	027X036N	027X025N	027X016N
Potential production (lb/acre):				
Favorable years	200	200	400	300
Normal years	100	100	200	200
Unfavorable years	50	50	50	50

1153--Gynelle gravelly loamy sand, 2 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Gynelle	1	2	3
Indian ricegrass	ORHY	10-20	5-10	5-10	1-10
Bottlebrush squirreltail	SIHY	5-10	2- 5	---	---
King desertgrass	BLKI	---	---	---	1- 2
Other perennial grasses	PPGG	5-10	2- 5	5-10	5-10
Annual grasses	AAGG	---	---	2- 4	1- 5
Perennial forbs	PPFF	3- 7	5-10	2- 6	5-10
Annual forbs	A AFF	2- 5	---	1- 5	2- 5
Shadscale	ATCO	10-20	10-20	---	20-40
Cooper wolfberry	LYCO2	5-20	5-15	2- 5	5-15
Bailey greasewood	SAVEB	5-10	---	2-10	10-15
Black greasewood	SAVE4	---	30-40	---	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	5-15	---
Burrobrush	HYMEN3	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	5-10	---
Nevada ephedra	EPNE	---	---	2- 5	---
Other shrubs	SSSS	5-15	2- 5	10-20	5-15
Range site number		027X043N	027X036N	029X041N	029X032N
Potential production (lb/acre):					
Favorable years		400	200	500	150
Normal years		200	100	300	100
Unfavorable years		100	50	100	50

1155--Gynelle-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Gynelle	Izo	1	2	3	4
Indian ricegrass	ORHY	10-20	5-10	10-20	5-10	1-10	10-20
Bottlebrush squirreltail	SIHY	5-10	---	5-10	---	---	5-10
King desertgrass	BLKI	---	---	---	---	1- 2	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-10
Annual grasses	AAGG	---	2- 4	---	2- 4	1- 5	---
Perennial forbs	PPFF	3- 7	2- 6	3- 7	2- 6	5-10	3- 7
Annual forbs	AAFF	2- 5	1- 5	2- 5	1- 5	2- 5	2- 5
Shadscale	ATCO	10-20	---	10-20	---	20-40	10-20
Cooper wolfberry	LYCO2	5-20	2- 5	5-20	2- 5	5-15	5-20
Bailey greasewood	SAVEB	5-10	2-10	5-10	2-10	10-15	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---	10-25	---	---
Fourwing saltbush	ATCA2	---	5-15	---	5-15	---	---
Burrobrush	HYMEN3	---	5-10	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	5-10	---	---
Nevada ephedra	EPNE	---	2- 5	---	2- 5	---	---
Other shrubs	SSSS	5-15	10-20	5-15	10-20	5-15	5-15
Range site number		027X043N	029X041N	027X043N	029X041N	029X032N	027X043N
Potential production (lb/acre):							
Favorable years		400	500	400	500	150	400
Normal years		200	300	200	300	100	200
Unfavorable years		100	100	100	100	50	100

## 1156--Gynelle-Izo association, strongly sloping

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Gynelle	Izo	1	2
Indian ricegrass	ORHY	30-50	5-10	30-50	30-50
Other perennial grasses	PPGG	2- 5	5-10	2- 5	2- 5
Annual grasses	AAGG	---	2- 4	---	---
Globemallow	SPHAE	1- 3	---	1- 3	1- 3
Birdcage eveningprimrose	OEDE2	1- 3	---	1- 3	1- 3
Other perennial forbs	PPFF	2- 5	2- 6	2- 5	2- 5
Annual forbs	AAFF	---	1- 5	---	---
Fourwing saltbush	ATCA2	15-30	5-15	15-30	15-30
Cooper wolfberry	LYCO2	10-20	2- 5	10-20	10-20
Nevada dalea	DAPO2	5-10	---	5-10	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Bailey greasewood	SAVEB	---	2-10	---	---
Nevada ephedra	EPNE	---	2- 5	---	---
Other shrubs	SSSS	5-15	10-20	5-15	5-15
Range site number		027X060N	029X041N	027X060N	027X060N
Potential production (lb/acre):					
Favorable years		400	500	400	400
Normal years		200	300	200	200
Unfavorable years		100	100	100	100

1171--Hawsley-Theon association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Hawsley	Theon	1	2	3
Indian ricegrass	ORHY	30-50	5-15	30-50	10-20	5-10
Needleandthread	STCO4	2-10	---	2-10	---	---
Desert needlegrass	STSP3	---	5-15	---	---	---
Bottlebrush squirreltail	SIHY	---	2-10	---	5-10	2-10
Other perennial grasses	PPGG	2-10	5-10	2-10	5-10	5-10
Perennial forbs	PPFF	2- 5	5-10	2- 5	3- 7	2- 5
Annual forbs	AAFF	2- 5	---	2- 5	2- 5	5-15
Fourwing saltbush	ATCA2	5-15	---	5-15	---	5-10
Winterfat	EULA5	2-10	2- 5	2-10	---	---
Nevada dalea	DAPO2	2-10	---	2-10	---	---
Shadscale	ATCO	---	10-20	---	10-20	---
Bailey greasewood	SAVEB	---	5-10	---	5-10	5-20
Bud sagebrush	ARSP5	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	---	5-20	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-25
Rubber rabbitbrush	CHNA2	---	---	---	---	5-20
Spiny hopsage	GRSP	---	---	---	---	5-20
Burrobrush	HYMEN3	---	---	---	---	5-10
Nevada ephedra	EPNE	---	---	---	---	2- 5
Black greasewood	SAVE4	---	---	---	---	2- 5
Other shrubs	SSSS	5-10	2- 5	5-10	5-15	2- 5

Range site number	027X009N	027X019N	027X009N	027X043N	027X022N
Potential production (lb/acre):					
Favorable years	800	350	800	400	400
Normal years	450	200	450	200	200
Unfavorable years	200	50	200	100	50

## 1172--Hawsley sand, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Hawsley	1	2
Indian ricegrass	ORHY	30-50	30-50	15-25
Needleandthread	STCO4	2-10	---	10-15
Other perennial grasses	PPGG	2-10	2- 5	---
Globemallow	SPHAE	---	1- 3	---
Birdcage eveningprimrose	OEDE2	---	1- 3	---
Other perennial forbs	PPFF	2- 5	2- 5	2- 5
Annual forbs	AAFF	2- 5	---	2- 5
Fourwing saltbush	ATCA2	5-15	15-30	10-20
Winterfat	EULA5	2-10	---	---
Nevada dalea	DAPO2	2-10	5-10	5-10
Cooper wolfberry	LYCO2	---	10-20	---
Hairy horsebrush	TECO2	---	---	30-40
Littleleaf horsebrush	TEGL	---	---	5-10
Other shrubs	SSSS	5-10	5-15	5-10
Range site number		027X009N	027X060N	027X023N
Potential production (lb/acre):				
Favorable years		800	400	300
Normal years		450	200	200
Unfavorable years		200	100	100

1173--Hawsley-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Hawsley	Izo	1	2
Indian ricegrass	ORHY	30-50	5-10	30-50	5-10
Needleandthread	STCO4	2-10	---	2-10	---
Galleta	HIJA	---	---	---	10-25
Bottlebrush squirreltail	SIHY	---	---	---	2- 5
Needlegrass	STIPA	---	---	---	2- 5
Dropseed	SPORO	---	---	---	2- 5
Other perennial grasses	PPGG	2-10	5-10	2-10	5-15
Annual grasses	AAGG	---	2- 4	---	1- 5
Perennial forbs	PPFF	2- 5	2- 6	2- 5	4-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	1- 5
Fourwing saltbush	ATCA2	5-15	5-15	5-15	---
Winterfat	EULA5	2-10	---	2-10	5-10
Nevada dalea	DAPO2	2-10	---	2-10	---
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Bailey greasewood	SAVEB	---	2-10	---	5-10
Nevada ephedra	EPNE	---	2- 5	---	1- 5
Cooper wolfberry	LYCO2	---	2- 5	---	---
Shadscale	ATCO	---	---	---	10-25
Bud sagebrush	ARSP5	---	---	---	5-10
Other shrubs	SSSS	5-10	10-20	5-10	10-20
Range site number		027X009N	029X041N	029X009N	029X017N
Potential production (lb/acre):					
Favorable years		800	500	800	350
Normal years		450	300	450	250
Unfavorable years		200	100	200	100

1174--Hawsley-Typic Torriorthents association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Hawsley	Typic Torriorthents	1	2	3	4
Indian ricegrass	ORHY	30-50	10-20	15-25	10-20	5-10	30-50
Needleandthread	STCO4	2-10	---	10-15	---	---	2-10
Bottlebrush squirreltail	SIHY	---	5-10	---	5-10	2-10	---
Other perennial grasses	PPGG	2-10	5-10	---	5-10	5-10	2-10
Perennial forbs	PPFF	2- 5	3- 7	2- 5	3- 7	2- 5	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	5-15	2- 5
Fourwing saltbush	ATCA2	5-15	---	10-20	---	5-10	5-15
Winterfat	EULA5	2-10	---	---	---	---	2-10
Nevada dalea	DAPO2	2-10	---	5-10	---	---	2-10
Shadscale	ATCO	---	10-20	---	10-20	---	---
Cooper wolfberry	LYCO2	---	5-20	---	5-20	---	---
Bailey greasewood	SAVEB	---	5-10	---	5-10	5-20	---
Hairy horsebrush	TECO2	---	---	30-40	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	5-25	---
Rubber rabbitbrush	CHNA2	---	---	---	---	5-20	---
Spiny hopsage	GRSP	---	---	---	---	5-20	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Nevada ephedra	EPNE	---	---	---	---	2- 5	---
Black greasewood	SAVE4	---	---	---	---	2- 5	---
Other shrubs	SSSS	5-10	5-15	5-10	5-15	2- 5	5-10

Range site number	027X009N	027X043N	027X023N	027X043N	027X022N	027X009N
Potential production (lb/acre):						
Favorable years	800	400	300	400	400	800
Normal years	450	200	200	200	200	450
Unfavorable years	200	100	100	100	50	200

1180--Buckaroo-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Buckaroo	Bluewing	1	2	3	4
Indian ricegrass	ORHY	10-20	10-20	5-10	5-20	10-20	30-50
Bottlebrush squirreltail	SIHY	5-10	5-10	2-10	---	5-10	---
Galleta	HIJA	---	---	---	5-10	---	---
Needleandthread	STCO4	---	---	---	---	---	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	2-10
Annual grasses	AAGG	---	---	---	1- 5	---	---
Perennial forbs	PPFF	3- 7	3- 7	2- 5	5-10	3- 7	2- 5
Annual forbs	AAFF	2- 5	2- 5	5-15	2- 5	2- 5	2- 5
Shadscale	ATCO	15-30	15-30	---	5-15	15-30	---
Bailey greasewood	SAVEB	10-20	10-20	5-20	5-15	10-20	---
Bud sagebrush	ARSP5	5-15	5-15	---	5-10	5-15	---
Littleleaf horsebrush	TEGL	---	---	5-25	---	---	---
Rubber rabbitbrush	CHNA2	---	---	5-20	---	---	---
Spiny hopsage	GRSP	---	---	5-20	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Fourwing saltbush	ATCA2	---	---	5-10	---	---	5-15
Nevada ephedra	EPNE	---	---	2- 5	5-10	---	---
Black greasewood	SAVE4	---	---	2- 5	---	---	---
Spiny menodora	MESP2	---	---	---	10-30	---	---
Winterfat	EULA5	---	---	---	---	---	2-10
Nevada dalea	DAP02	---	---	---	---	---	2-10
Other shrubs	SSSS	5-10	5-10	2- 5	10-20	5-10	5-10
Range site number		027X018N	027X018N	027X022N	029X036N	027X018N	027X009N
Potential production (lb/acre):							
Favorable years		500	500	400	400	500	800
Normal years		300	300	200	300	300	450
Unfavorable years		100	100	50	100	100	200

1190--Old Camp-Theon-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Old Camp	Theon	Rock outcrop	1	2	3
Pine bluegrass	POSC	20-30	---	---	---	---	---
Needlegrass	STIPA	5-15	---	---	2-10	---	---
Desert needlegrass	STSP3	---	5-15	---	---	20-30	---
Bottlebrush squirreltail	SIHY	---	2-10	---	1- 5	2- 5	---
Indian ricegrass	ORHY	---	5-15	---	5-10	5-10	---
Galleta	HIJA	---	---	---	5-15	---	---
Bluegrass	POA++	---	---	---	2-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-15	5-10	---	10-15	2- 5	10-25
Annual grasses	AAGG	---	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	---	5-10	5-10	2- 5
Annual forbs	AAFF	---	---	---	1- 5	---	2- 5
Wyoming big sagebrush	ARTRW	10-20	---	---	---	---	---
Spiny hopsage	GRSP	5-15	---	---	---	---	10-20
Nevada ephedra	EPNE	5-10	---	---	5-10	---	---
Shadscale	ATCO	---	10-20	---	---	5-15	---
Bailey greasewood	SAVEB	---	5-10	---	---	---	---
Bud sagebrush	ARSP5	---	5-10	---	2- 5	---	---
Winterfat	EULA5	---	2- 5	---	2- 5	---	---
Black sagebrush	ARARN	---	---	---	15-20	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	10-20	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	10-30
Other shrubs	SSSS	5-10	2- 5	---	10-20	5-15	5-15
Range site number		027X007N	027X019N	None	029X014N	027X017N	027X029N
Potential production (lb/acre):							
Favorable years		600	350	---	500	400	800
Normal years		450	200	---	300	200	500
Unfavorable years		300	50	---	100	100	100

1200--Playas

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Playas	1	2	3
Indian ricegrass	ORHY	---	10-20	---	---
Needleandthread	STCO4	---	5-10	---	---
Alkali sacaton	SPAI	---	---	20-30	---
Inland saltgrass	DIST	---	---	10-20	5-10
Basin wildrye	ELCI2	---	---	5-15	---
Creeping wildrye	ELTR3	---	---	5-10	---
Baltic rush	JUBA	---	---	5-10	---
Other perennial grasses	PPGG	---	2- 5	5-10	5-15
Perennial forbs	PPFF	---	2- 5	5-10	3- 7
Annual forbs	AAFF	---	2- 5	2- 5	---
Black greasewood	SAVE4	---	10-40	5-10	40-60
Iodinebush	ALOC2	---	---	2- 5	---
Seepweed	SUAED	---	---	2- 5	2- 5
Shadscale	ATCO	---	---	---	2-10
Trees	TTTT	---	---	5-10	---
Range site number		None	027X016N	027X005N	027X025N
Potential production (lb/acre):					
Favorable years		---	300	2,000	400
Normal years		---	200	1,500	200
Unfavorable years		---	50	1,000	50

## 1201--Playas-Slaw association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Playas	Slaw	1	2
Inland saltgrass	DIST	---	5-10	---	---
Indian ricegrass	ORHY	---	---	10-20	5-10
Needleandthread	STCO4	---	---	5-10	---
Bottlebrush squirreltail	SIHY	---	---	---	2- 5
Other perennial grasses	PPGG	---	5-15	2- 5	2- 5
Perennial forbs	PPFF	---	3- 7	2- 5	5-10
Annual forbs	AAFF	---	---	2- 5	---
Black greasewood	SAVE4	---	40-60	10-40	30-40
Shadscale	ATCO	---	2-10	---	10-20
Seepweed	SUAED	---	2- 5	---	---
Cooper wolfberry	LYCO2	---	---	---	5-15
Range site number		None	027X025N	027X016N	027X036N
Potential production (lb/acre):					
Favorable years		---	400	300	200
Normal years		---	200	200	100
Unfavorable years		---	50	50	50

1205--Badland

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Badland	1
Indian ricegrass	ORHY	---	5-10
Bottlebrush squirreltail	SIHY	---	2- 5
Other perennial grasses	PPGG	---	2- 5
Perennial forbs	PPFF	---	5-10
Black greasewood	SAVE4	---	30-40
Shadscale	ATCO	---	10-20
Cooper wolfberry	LYCO2	---	5-15
Range site number		None	027X036N
Potential production (lb/acre):			
Favorable years		---	200
Normal years		---	100
Unfavorable years		---	50

1210--Trocken-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Trocken	Bluewing	1	2
Indian ricegrass	ORHY	10-20	5-10	10-20	10-20
Bottlebrush squirreltail	SIHY	5-10	2-10	5-10	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	3- 7	2- 5	3- 7	3- 7
Annual forbs	AAFF	2- 5	5-15	2- 5	2- 5
Shadscale	ATCO	15-30	---	15-30	15-30
Bailey greasewood	SAVEB	10-20	5-20	10-20	10-20
Bud sagebrush	ARSP5	5-15	---	5-15	5-15
Littleleaf horsebrush	TEGL	---	5-25	---	---
Rubber rabbitbrush	CHNA2	---	5-20	---	---
Spiny hopsage	GRSP	---	5-20	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Fourwing saltbush	ATCA2	---	5-10	---	---
Nevada ephedra	EPNE	---	2- 5	---	---
Black greasewood	SAVE4	---	2- 5	---	---
Other shrubs	SSSS	5-10	2- 5	5-10	5-10
Range site number		027X018N	027X022N	027X018N	027X018N
Potential production (lb/acre):					
Favorable years		500	400	500	500
Normal years		300	200	300	300
Unfavorable years		100	50	100	100

1221--Eastgate gravelly sandy loam, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Eastgate	1	2	3
Indian ricegrass	ORHY	10-20	---	1-10	30-50
Bottlebrush squirreltail	SIHY	5-10	---	---	---
Inland saltgrass	DIST	---	5-10	---	---
King desertgrass	BLKI	---	---	1- 2	---
Other perennial grasses	PPGG	5-10	5-15	5-10	2- 5
Annual grasses	AAGG	---	---	1- 5	---
Globemallow	SPHAE	---	---	---	1- 3
Birdcage eveningprimrose	OEDE2	---	---	---	1- 3
Other perennial forbs	PPFF	3- 7	3- 7	5-10	2- 5
Annual forbs	AAFF	2- 5	---	2- 5	---
Shadscale	ATCO	10-20	2-10	20-40	---
Cooper wolfberry	LYCO2	5-20	---	5-15	10-20
Bailey greasewood	SAVEB	5-10	---	10-15	---
Black greasewood	SAVE4	---	40-60	---	---
Seepweed	SUAED	---	2- 5	---	---
Fourwing saltbush	ATCA2	---	---	---	15-30
Nevada dalea	DAPO2	---	---	---	5-10
Other shrubs	SSSS	5-15	5-15	5-15	5-15
Range site number		027X043N	027X025N	029X032N	027X060N
Potential production (lb/acre):					
Favorable years		400	400	150	400
Normal years		200	200	100	200
Unfavorable years		100	50	50	100

1223--Eastgate-Cirac association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Eastgate	Cirac	1	2	3
Indian ricegrass	ORHY	30-50	---	10-20	30-50	10-20
Inland saltgrass	DIST	---	5-10	---	---	---
Needleandthread	STCO4	---	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	---	---	---	5-10
Other perennial grasses	PPGG	2- 5	5-15	2- 5	2- 5	5-10
Globemallow	SPHAE	1- 3	---	---	1- 3	---
Birdcage eveningprimrose	OEDE2	1- 3	---	---	1- 3	---
Other perennial forbs	PPFF	2- 5	3- 7	2- 5	2- 5	3- 7
Annual forbs	AAFF	---	---	2- 5	---	2- 5
Fourwing saltbush	ATCA2	15-30	---	---	15-30	---
Cooper wolfberry	LYCO2	10-20	---	---	10-20	5-20
Nevada dalea	DAPO2	5-10	---	---	5-10	---
Black greasewood	SAVE4	---	40-60	10-40	---	---
Shadscale	ATCO	---	2-10	---	---	10-20
Seepweed	SUAED	---	2- 5	---	---	---
Bailey greasewood	SAVEB	---	---	---	---	5-10
Other shrubs	SSSS	5-15	5-15	5-20	5-15	5-15
Range site number		027X060N	027X025N	027X016N	027X060N	027X043N
Potential production (lb/acre):						
Favorable years		400	400	300	400	400
Normal years		200	200	200	200	200
Unfavorable years		100	50	50	100	100

1240--Blacktop-Downeyville-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Blacktop	Downeyville	Rock outcrop	1	2	3	4
Indian ricegrass	ORHY	2- 5	5-15	---	5-10	---	---	---
Bottlebrush squirreltail	SIHY	1- 2	2- 5	---	---	2-10	---	2- 5
Galleta	HIJA	---	5-20	---	---	---	---	10-25
Needlegrass	STIPA	---	5-10	---	---	---	5-15	2- 5
Bluegrass	POA++	---	---	---	---	10-30	---	---
Pine bluegrass	POSC	---	---	---	---	---	20-30	---
Dropseed	SPORO	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	1- 5	5-10	---	5-10	2-10	5-15	5-15
Annual grasses	AAGG	1- 5	1- 5	---	2- 4	---	---	1- 5
Perennial forbs	PPFF	2- 5	5-10	---	2- 6	5-10	5-10	4-10
Annual forbs	AAFF	1- 5	2- 5	---	1- 5	---	---	1- 5
Shadscale	ATCO	40-60	15-25	---	---	10-20	---	10-25
Bailey greasewood	SAVEB	10-15	5-15	---	2-10	5-10	---	5-10
Nevada dalea	DAPO2	5-10	---	---	---	---	---	---
Cooper wolfberry	LYCO2	2- 5	---	---	2- 5	---	---	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	5-10	---	5-10
Nevada ephedra	EPNE	---	2- 5	---	2- 5	---	5-10	1- 5
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	10-20	---
Spiny hopsage	GRSP	---	---	---	---	---	5-15	---
Winterfat	EULA5	---	---	---	---	---	---	5-10
Other shrubs	SSSS	5-15	10-20	---	10-20	5-15	5-10	10-20

Range site number	029X033N	029X022N	None	029X041N	027X030N	027X007N	029X017N
Potential production (lb/acre):							
Favorable years	100	300	---	500	400	600	350
Normal years	50	200	---	300	300	450	250
Unfavorable years	25	100	---	100	200	300	100

1241--Blacktop-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Blacktop	Rock outcrop	1	2	3
Indian ricegrass	ORHY	2- 5	---	5-15	---	5-10
King desertgrass	BLKI	1- 2	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 2	---	2- 5	---	---
Galleta	HIJA	---	---	5-20	---	---
Needlegrass	STIPA	---	---	5-10	5-15	---
Pine bluegrass	POSC	---	---	---	20-30	---
Other perennial grasses	PPGG	1- 5	---	5-10	5-15	5-10
Annual grasses	AAGG	1- 5	---	1- 5	---	2- 4
Perennial forbs	PPFF	2- 5	---	5-10	5-10	2- 6
Annual forbs	AAFF	1- 5	---	2- 5	---	1- 5
Shadscale	ATCO	40-60	---	15-25	---	---
Bailey greasewood	SAVEB	10-15	---	5-15	---	2-10
Nevada dalea	DAPO2	5-10	---	---	---	---
Cooper wolfberry	LYCO2	2- 5	---	---	---	2- 5
Bud sagebrush	ARSP5	2- 5	---	2- 5	---	---
Nevada ephedra	EPNE	---	---	2- 5	5-10	2- 5
Wyoming big sagebrush	ARTRW	---	---	---	10-20	---
Spiny hopsage	GRSP	---	---	---	5-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	5-15
Burrobrush	HYMEN3	---	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	---	5-10
Other shrubs	SSSS	5-15	---	10-20	5-10	10-20
Range site number		029X033N	None	029X022N	027X007N	029X041N
Potential production (lb/acre):						
Favorable years		100	---	300	600	500
Normal years		50	---	200	450	300
Unfavorable years		25	---	100	300	100

1243--Blacktop-Rodad-Theriot association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Blacktop	Rodad	Theriot	1	2	3	4
Indian ricegrass	ORHY	2- 5	5-15	5-15	---	5-10	2- 5	5-10
King desertgrass	BLKI	1- 2	---	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 2	2- 5	2- 5	---	---	---	1- 5
Galleta	HIJA	---	5-20	5-20	---	---	10-20	5-15
Needlegrass	STIPA	---	5-10	5-10	---	---	5-10	2-10
Bluegrass	POA++	---	---	---	---	---	---	2-10
Other perennial grasses	PPGG	1- 5	5-10	5-10	---	5-10	5-10	10-15
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	2- 4	1- 5	1- 5
Perennial forbs	PPFF	2- 5	5-10	5-10	---	2- 6	5-10	5-10
Annual forbs	AAFF	1- 5	2- 5	2- 5	---	1- 5	2- 5	1- 5
Shadscale	ATCO	40-60	15-25	15-25	---	---	2- 5	---
Bailey greasewood	SAVEB	10-15	5-15	5-15	---	2-10	5-10	---
Nevada dalea	DAPO2	5-10	---	---	---	---	---	---
Cooper wolfberry	LYCO2	2- 5	---	---	---	2- 5	---	---
Bud sagebrush	ARSP5	2- 5	2- 5	2- 5	---	---	2- 5	2- 5
Nevada ephedra	EPNE	---	2- 5	2- 5	---	2- 5	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---	---
Spiny menodora	MESP2	---	---	---	---	---	10-25	---
Anderson wolfberry	LYAN	---	---	---	---	---	5-10	---
Black sagebrush	ARARN	---	---	---	---	---	---	15-20
Winterfat	EULA5	---	---	---	---	---	---	2- 5
Other shrubs	SSSS	5-15	10-20	10-20	---	10-20	15-25	10-20
Range site number		029X033N	029X022N	029X022N	None	029X041N	029X037N	029X014N
Potential production (lb/acre):								
Favorable years		100	300	300	---	500	300	500
Normal years		50	200	200	---	300	200	300
Unfavorable years		25	100	100	---	100	100	100

1280--Chill-Petspring association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Chill	Petspring	1	2	3	4
Pine bluegrass	POSC	5-15	---	---	20-30	5-15	---
Indian ricegrass	ORHY	5-15	5-10	---	---	5-15	---
Bottlebrush squirreltail	SIHY	5-10	---	---	---	5-10	---
Needleandthread	STCO4	2-10	---	---	---	2-10	---
Desert needlegrass	STSP3	---	20-40	---	---	---	---
Galleta	HIJA	---	5-15	---	---	---	---
Needlegrass	STIPA	---	---	---	5-15	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-10	---	5-15	5-10	10-25
Perennial forbs	PPFF	5-10	2- 5	---	5-10	5-10	2- 5
Annual forbs	AAFF	---	---	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	10-20	15-25	---	10-20	10-20	---
Spiny hopsage	GRSP	10-20	5-15	---	5-15	10-20	10-20
Nevada ephedra	EPNE	5-10	5-15	---	5-10	5-10	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	10-30
Other shrubs	SSSS	5-15	5-10	---	5-10	5-15	5-15
Range site number		027X008N	027X065N	None	027X007N	027X008N	027X029N
Potential production (lb/acre):							
Favorable years		700	500	---	600	700	800
Normal years		500	300	---	450	500	500
Unfavorable years		300	200	---	300	300	100

1281--Chill-Beelem-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Chill	Beelem	Rock outcrop	1	2	3
Pine bluegrass	POSC	5-15	---	---	5-15	---	20-30
Indian ricegrass	ORHY	5-15	X	---	5-15	5-10	---
Bottlebrush squirreltail	SIHY	5-10	X	---	5-10	1- 5	---
Needleandthread	STCO4	2-10	---	---	2-10	---	---
Galleta	HIJA	---	---	---	---	5-15	---
Needlegrass	STIPA	---	---	---	---	2-10	5-15
Bluegrass	POA++	---	---	---	---	2-10	---
Other perennial grasses	PPGG	5-10	X	---	5-10	10-15	5-15
Annual grasses	AAGG	---	---	---	---	1- 5	---
Perennial forbs	PPFF	5-10	X	---	5-10	5-10	5-10
Annual forbs	AAFF	---	---	---	---	1- 5	---
Wyoming big sagebrush	ARTRW	10-20	X	---	10-20	---	10-20
Spiny hopsage	GRSP	10-20	---	---	10-20	---	5-15
Nevada ephedra	EPNE	5-10	X	---	5-10	5-10	5-10
Black sagebrush	ARARN	---	X	---	---	15-20	---
Green ephedra	EPVI	---	X	---	---	---	---
Bud sagebrush	ARSP5	---	---	---	---	2- 5	---
Winterfat	EULA5	---	---	---	---	2- 5	---
Other shrubs	SSSS	5-15	X	---	5-15	10-20	5-10
Utah juniper	JUOS	---	X	---	---	---	---
Singleleaf pinyon	PIMO	---	X	---	---	---	---
Range site number		027X008N	029X081N	None	027X008N	029X014N	027X007N
Potential production (lb/acre):							
Favorable years		700	125	---	700	500	600
Normal years		500	75	---	500	300	450
Unfavorable years		300	25	---	300	100	300

## 1282--Chill-Veet association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Chill	Veet	1	2	3
Pine bluegrass	POSC	5-15	---	---	---	---
Indian ricegrass	ORHY	5-15	5-15	5-10	---	5-10
Bottlebrush squirreltail	SIHY	5-10	1- 5	1- 5	---	---
Needleandthread	STCO4	2-10	---	---	---	---
Galleta	HIJA	---	5-25	5-15	---	5-20
Needlegrass	STIPA	---	5-15	2-10	---	5-15
Dropseed	SPORO	---	5-10	---	---	---
Bluegrass	POA++	---	---	2-10	---	---
Other perennial grasses	PPGG	5-10	5-20	10-15	---	10-15
Annual grasses	AAGG	---	1- 5	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	3-10	5-10	---	3- 8
Annual forbs	A AFF	---	2- 5	1- 5	---	2- 5
Wyoming big sagebrush	ARTRW	10-20	15-20	---	---	---
Spiny hopsage	GRSP	10-20	5-10	---	---	---
Nevada ephedra	EPNE	5-10	---	5-10	---	2- 5
Bud sagebrush	ARSP5	---	5-10	2- 5	---	5-10
Winterfat	EULA5	---	2-10	2- 5	---	2- 5
Black sagebrush	ARARN	---	---	15-20	---	20-25
Other shrubs	SSSS	5-15	10-20	10-20	---	10-20
Range site number		027X008N	029X049N	029X014N	None	029X008N
Potential production (lb/acre):						
Favorable years		700	900	500	---	700
Normal years		500	600	300	---	400
Unfavorable years		300	300	100	---	200

1283--Chill-Itme association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Chill	Itme	1
Pine bluegrass	POSC	5-15	---	---
Indian ricegrass	ORHY	5-15	5-20	---
Bottlebrush squirreltail	SIHY	5-10	---	---
Needleandthread	STCO4	2-10	---	---
Galleta	HIJA	---	5-20	---
Dropseed	SPORO	---	2-10	---
Sandberg bluegrass	POSE	---	---	2- 5
Basin wildrye	ELCI2	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-15	10-25
Annual grasses	AAGG	---	2- 5	---
Perennial forbs	PPFF	5-10	5-10	2- 5
Annual forbs	AAFF	---	1- 5	2- 5
Wyoming big sagebrush	ARTRW	10-20	---	---
Spiny hopsage	GRSP	10-20	10-20	10-20
Nevada ephedra	EPNE	5-10	2- 5	---
Bud sagebrush	ARSP5	---	5-20	---
Anderson wolfberry	LYAN	---	5-15	---
Nevada dalea	DAPO2	---	2-10	---
Cooper wolfberry	LYCO2	---	2- 5	---
Big sagebrush	ARTR2	---	---	10-30
Rabbitbrush	CHRS9	---	---	10-30
Other shrubs	SSSS	5-15	10-20	5-15

Range site number	027X008N	029X016N	027X029N
Potential production (lb/acre):			
Favorable years	700	400	800
Normal years	500	300	500
Unfavorable years	300	200	100

1290--Petspring-Rock outcrop-Budihol association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Petspring	Rock outcrop	Budihol	1	2	3
Desert needlegrass	STSP3	20-40	---	---	---	20-40	---
Galleta	HIJA	5-15	---	---	---	5-15	---
Indian ricegrass	ORHY	5-10	---	---	5-15	5-10	---
Pine bluegrass	POSC	---	---	20-30	5-15	---	---
Needlegrass	STIPA	---	---	5-15	---	---	---
Bottlebrush squirreltail	SIHY	---	---	---	5-10	---	---
Needleandthread	STCO4	---	---	---	2-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	---	5-15	5-10	5-10	10-25
Perennial forbs	PPFF	2- 5	---	5-10	5-10	2- 5	2- 5
Annual forbs	AAFF	---	---	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	15-25	---	10-20	10-20	15-25	---
Nevada ephedra	EPNE	5-15	---	5-10	5-10	5-15	---
Spiny hopsage	GRS	5-15	---	5-15	10-20	5-15	10-20
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRY5	---	---	---	---	---	10-30
Other shrubs	SSSS	5-10	---	5-10	5-15	5-10	5-15
Range site number		027X065N	None	027X007N	027X008N	027X065N	027X029N
Potential production (lb/acre):							
Favorable years		500	---	600	700	500	800
Normal years		300	---	450	500	300	500
Unfavorable years		200	---	300	300	200	100

1291--Petspring-Uripnes-Beelem association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Petspring	Uripnes	Beelem	1	2	3	4
Desert needlegrass	STSP3	20-40	20-30	---	---	---	---	---
Galleta	HIJA	5-15	5-10	---	---	---	---	5-15
Indian ricegrass	ORHY	5-10	2- 5	X	---	---	15-20	5-10
Bottlebrush squirreltail	SIHY	---	---	X	---	---	5-10	1- 5
Pine bluegrass	POSC	---	---	---	---	20-30	---	---
Needlegrass	STIPA	---	---	---	---	5-15	5-15	2-10
Needleandthread	STCO4	---	---	---	---	---	15-20	---
Bluegrass	POA++	---	---	---	---	---	---	2-10
Other perennial grasses	PPGG	5-10	2- 5	X	---	5-15	---	10-15
Annual grasses	AAGG	---	---	---	---	---	---	1- 5
Perennial forbs	PPFF	2- 5	2- 5	X	---	5-10	5-10	5-10
Annual forbs	AAFF	---	---	---	---	---	2- 5	1- 5
Wyoming big sagebrush	ARTRW	15-25	---	X	---	10-20	---	---
Nevada ephedra	EPNE	5-15	5-10	X	---	5-10	---	5-10
Spiny hopsage	GRSP	5-15	---	---	---	5-15	2- 5	---
Anderson wolfberry	LYAN	---	10-20	---	---	---	---	---
Littleleaf horsebrush	TEGL	---	10-15	---	---	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---	---	---
Shadscale	ATCO	---	2- 5	---	---	---	---	---
Black sagebrush	ARARN	---	---	X	---	---	---	15-20
Green ephedra	EPVI	---	---	X	---	---	---	---
Basin big sagebrush	ARTRT	---	---	---	---	---	5-10	---
Anderson peachbrush	PRAN2	---	---	---	---	---	2- 5	---
Bud sagebrush	ARSP5	---	---	---	---	---	---	2- 5
Winterfat	EULA5	---	---	---	---	---	---	2- 5
Other shrubs	SSSS	5-10	5-10	X	---	5-10	5-15	10-20
Utah juniper	JUOS	---	---	X	---	---	---	---
Singleleaf pinyon	PIMO	---	---	X	---	---	---	---

Range site number	027X065N	027X047N	029X081N	None	027X007N	026X020	029X014N
Potential production (lb/acre):							
Favorable years	500	400	125	---	600	800	500
Normal years	300	200	75	---	450	600	300
Unfavorable years	200	100	25	---	300	400	100

1301--Sundown loamy sand, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Sundown	1	2	3
Indian ricegrass	ORHY	30-50	30-50	5-10	30-50
Other perennial grasses	PPGG	2- 5	2- 5	5-10	2- 5
Annual grasses	AAGG	---	---	2- 4	---
Globemallow	SPHAE	1- 3	1- 3	---	1- 3
Birdcage eveningprimrose	OEDE2	1- 3	1- 3	---	1- 3
Other perennial forbs	PPFF	2- 5	2- 5	2- 6	2- 5
Annual forbs	AAFF	---	---	1- 5	---
Fourwing saltbush	ATCA2	15-30	15-30	5-15	15-30
Cooper wolfberry	LYCO2	10-20	10-20	2- 5	10-20
Nevada dalea	DAPO2	5-10	5-10	---	5-10
Rubber rabbitbrush	CHNA2	---	---	10-25	---
Burrobrush	HYMEN3	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	5-10	---
Bailey greasewood	SAVEB	---	---	2-10	---
Nevada ephedra	EPNE	---	---	2- 5	---
Other shrubs	SSSS	5-15	5-15	10-20	5-15
Range site number		027X060N	027X060N	029X041N	027X060N
Potential production (lb/acre):					
Favorable years		400	400	500	400
Normal years		200	200	300	200
Unfavorable years		100	100	100	100

1310--Typic Torriorthents-Gynelle-Oricto association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Typic Torriorthents	Gynelle	Oricto	1	2	3
Indian ricegrass	ORHY	2- 5	10-20	1-10	5-10	---	5-10
King desertgrass	BLKI	1- 2	---	1- 2	---	---	---
Bottlebrush squirreltail	SIHY	1- 2	5-10	---	---	---	---
Other perennial grasses	PPGG	1- 5	5-10	5-10	5-10	---	5-10
Annual grasses	AAGG	1- 5	---	1- 5	2- 4	---	2- 4
Perennial forbs	PPFF	2- 5	3- 7	5-10	2- 6	---	2- 6
Annual forbs	AAFF	1- 5	2- 5	2- 5	1- 5	---	1- 5
Shadscale	ATCO	40-60	10-20	20-40	---	---	---
Bailey greasewood	SAVEB	10-15	5-10	10-15	2-10	---	2-10
Nevada dalea	DAPO2	5-10	---	---	---	---	---
Cooper wolfberry	LYCO2	2- 5	5-20	5-15	2- 5	---	2- 5
Bud sagebrush	ARSP5	2- 5	---	---	---	---	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	10-25
Fourwing saltbush	ATCA2	---	---	---	5-15	---	5-15
Burrobrush	HYMEN3	---	---	---	5-10	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	5-10
Nevada ephedra	EPNE	---	---	---	2- 5	---	2- 5
Other shrubs	SSSS	5-15	5-15	5-15	10-20	---	10-20

Range site number	029X033N	027X043N	029X032N	029X041N	None	029X041N
Potential production (lb/acre):						
Favorable years	100	400	150	500	---	500
Normal years	50	200	100	300	---	300
Unfavorable years	25	100	50	100	---	100

1320--Belted-Downeyville association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Belted	Downeyville	1	2	3	4
Indian ricegrass	ORHY	5-20	2- 5	2- 5	5-10	---	2- 5
Galleta	HIJA	5-10	10-20	10-20	---	---	10-20
Needlegrass	STIPA	---	5-10	5-10	---	---	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	---	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	---	1- 5
Perennial forbs	PPFF	5-10	5-10	5-10	2- 6	---	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	1- 5	---	2- 5
Spiny menodora	MESP2	10-30	10-25	10-25	---	---	10-25
Bailey greasewood	SAVEB	5-15	5-10	5-10	2-10	---	5-10
Shadscale	ATCO	5-15	2- 5	2- 5	---	---	2- 5
Bud sagebrush	ARSP5	5-10	2- 5	2- 5	---	---	2- 5
Nevada ephedra	EPNE	5-10	5-10	5-10	2- 5	---	5-10
Anderson wolfberry	LYAN	---	5-10	5-10	---	---	5-10
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	---	---
Other shrubs	SSSS	10-20	15-25	15-25	10-20	---	15-25

Range site number	029X036N	029X037N	029X037N	029X041N	None	029X037N
Potential production (lb/acre):						
Favorable years	400	300	300	500	---	300
Normal years	300	200	200	300	---	200
Unfavorable years	100	100	100	100	---	100

1322--Belted-Annaw association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Belted	Annaw	1	2	3	4
Indian ricegrass	ORHY	5-20	5-20	2- 5	5-10	---	2- 5
Galleta	HIJA	5-10	5-10	10-20	---	---	10-20
Needlegrass	STIPA	---	---	5-10	---	5-15	5-10
Pine bluegrass	POSC	---	---	---	---	20-30	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-15	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	---	1- 5
Perennial forbs	PPFF	5-10	5-10	5-10	2- 6	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	1- 5	---	2- 5
Spiny menodora	MESP2	10-30	10-30	10-25	---	---	10-25
Bailey greasewood	SAVEB	5-15	5-15	5-10	2-10	---	5-10
Shadscale	ATCO	5-15	5-15	2- 5	---	---	2- 5
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	---	2- 5
Nevada ephedra	EPNE	5-10	5-10	5-10	2- 5	5-10	5-10
Anderson wolfberry	LYAN	---	---	5-10	---	---	5-10
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	10-20	---
Spiny hopsage	GRSP	---	---	---	---	5-15	---
Other shrubs	SSSS	10-20	10-20	15-25	10-20	5-10	15-25

Range site number	029X036N	029X036N	029X037N	029X041N	027X007N	029X037N
Potential production (lb/acre):						
Favorable years	400	400	300	500	600	300
Normal years	300	300	200	300	450	200
Unfavorable years	100	100	100	100	300	100

1323--Belted-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Belted	Izo	1	2	3
Indian ricegrass	ORHY	5-20	5-10	5-20	5-20	5-15
Galleta	HIJA	5-10	---	5-10	5-10	5-25
Needlegrass	STIPA	---	---	---	---	5-15
Dropseed	SPORO	---	---	---	---	5-10
Bottlebrush squirreltail	SIHY	---	---	---	---	1- 5
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-20
Annual grasses	AAGG	1- 5	2- 4	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	2- 6	5-10	5-10	3-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	---	10-30	10-30	---
Bailey greasewood	SAVEB	5-15	2-10	5-15	5-15	---
Shadscale	ATCO	5-15	---	5-15	5-15	---
Bud sagebrush	ARSP5	5-10	---	5-10	5-10	5-10
Nevada ephedra	EPNE	5-10	2- 5	5-10	5-10	---
Rubber rabbitbrush	CHNA2	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	15-20
Spiny hopsage	GRSP	---	---	---	---	5-10
Winterfat	EULA5	---	---	---	---	2-10
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20
Range site number		029X036N	029X041N	029X036N	029X036N	029X049N
Potential production (lb/acre):						
Favorable years		400	500	400	400	900
Normal years		300	300	300	300	600
Unfavorable years		100	100	100	100	300

## 1324--Belted-Annaw association, stony

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Belted	Annaw	1
Indian ricegrass	ORHY	5-20	5-20	5-10
Galleta	HIJA	5-10	5-10	---
Other perennial grasses	PPGG	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4
Perennial forbs	PPFF	5-10	5-10	2- 6
Annual forbs	AAFF	2- 5	2- 5	1- 5
Spiny menodora	MESP2	10-30	10-30	---
Bailey greasewood	SAVEB	5-15	5-15	2-10
Shadscale	ATCO	5-15	5-15	---
Bud sagebrush	ARSP5	5-10	5-10	---
Nevada ephedra	EPNE	5-10	5-10	2- 5
Rubber rabbitbrush	CHNA2	---	---	10-25
Fourwing saltbush	ATCA2	---	---	5-15
Burrobrush	HYMEN3	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	5-10
Cooper wolfberry	LYCO2	---	---	2- 5
Other shrubs	SSSS	10-20	10-20	10-20
Range site number		029X036N	029X036N	029X041N
Potential production (lb/acre):				
Favorable years		400	400	500
Normal years		300	300	300
Unfavorable years		100	100	100

1325--Belted-Terlco-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Belted	Terlco	Izo	1	2	3
Indian ricegrass	ORHY	5-20	5-20	5-10	5-20	5-20	5-10
Galleta	HIJA	5-10	5-10	---	5-10	5-10	10-25
Bottlebrush squirreltail	SIHY	---	---	---	---	---	2- 5
Needlegrass	STIPA	---	---	---	---	---	2- 5
Dropseed	SPORO	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-15
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 6	5-10	5-10	4-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	2- 5	1- 5
Spiny menodora	MESP2	10-30	10-30	---	10-30	10-30	---
Bailey greasewood	SAVEB	5-15	5-15	2-10	5-15	5-15	5-10
Shadscale	ATCO	5-15	5-15	---	5-15	5-15	10-25
Bud sagebrush	ARSP5	5-10	5-10	---	5-10	5-10	5-10
Nevada ephedra	EPNE	5-10	5-10	2- 5	5-10	5-10	1- 5
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	---
Winterfat	EULA5	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20	10-20
Range site number		029X036N	029X036N	029X041N	029X036N	029X036N	029X017N
Potential production (lb/acre):							
Favorable years		400	400	500	400	400	350
Normal years		300	300	300	300	300	250
Unfavorable years		100	100	100	100	100	100

1326--Belted-Breko association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Belted	Breko	1	2	3
Indian ricegrass	ORHY	5-20	5-10	5-15	---	5-20
Galleta	HIJA	5-10	5-15	5-25	---	5-10
Needlegrass	STIPA	---	2-10	5-15	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	1- 5	---	---
Dropseed	SPORO	---	---	5-10	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	2- 5	---
Other perennial grasses	PPGG	5-10	10-20	5-20	10-25	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	5-10	3-10	2- 5	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	---	---	---	10-30
Bailey greasewood	SAVEB	5-15	---	---	---	5-15
Shadscale	ATCO	5-15	---	---	---	5-15
Bud sagebrush	ARSP5	5-10	---	5-10	---	5-10
Nevada ephedra	EPNE	5-10	2- 5	---	---	5-10
Wyoming big sagebrush	ARTRW	---	15-20	15-20	---	---
Fourwing saltbush	ATCA2	---	5-10	---	---	---
Winterfat	EULA5	---	2- 5	2-10	---	---
Spiny hopsage	GRSP	---	2- 5	5-10	10-20	---
Big sagebrush	ARTR2	---	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	---	10-30	---
Other shrubs	SSSS	10-20	10-25	10-20	5-15	10-20

Range site number	029X036N	029X006N	029X049N	027X029N	029X036N
Potential production (lb/acre):					
Favorable years	400	800	900	800	400
Normal years	300	500	600	500	300
Unfavorable years	100	300	300	100	100

1327--Belted-Lathrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Belted	Lathrop	1	2	3	4
Indian ricegrass	ORHY	5-20	5-20	5-10	5-15	5-10	---
Galleta	HIJA	5-10	5-10	5-15	5-20	---	---
Needlegrass	STIPA	---	---	5-10	5-10	---	---
Bottlebrush squirreltail	SIHY	---	---	1- 4	2- 5	---	---
Other perennial grasses	PPGG	5-10	5-10	5-20	5-10	5-10	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	2- 4	---
Perennial forbs	PPFF	5-10	5-10	4-10	5-10	2- 6	---
Annual forbs	AAFF	2- 5	2- 5	2- 7	2- 5	1- 5	---
Spiny menodora	MESP2	10-30	10-30	---	---	---	---
Bailey greasewood	SAVEB	5-15	5-15	---	5-15	2-10	---
Shadscale	ATCO	5-15	5-15	---	15-25	---	---
Bud sagebrush	ARSP5	5-10	5-10	---	2- 5	---	---
Nevada ephedra	EPNE	5-10	5-10	5-10	2- 5	2- 5	---
Wyoming big sagebrush	ARTRW	---	---	20-30	---	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20	---
Range site number		029X036N	029X036N	029X010N	029X022N	029X041N	None
Potential production (lb/acre):							
Favorable years		400	400	600	300	500	---
Normal years		300	300	400	200	300	---
Unfavorable years		100	100	200	100	100	---

1328--Belted-Zadvar association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Belted	Zadvar	1	2	3	4
Indian ricegrass	ORHY	5-20	5-10	5-20	5-15	5-10	2- 5
Galleta	HIJA	5-10	5-20	5-10	5-20	5-15	10-20
Needlegrass	STIPA	---	5-15	---	2-10	2-10	5-10
Dropseed	SPORO	---	---	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	---	---	1- 5	1- 5	---
Bluegrass	POA++	---	---	---	---	2-10	---
Other perennial grasses	PPGG	5-10	10-15	5-10	5-10	10-15	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	3- 8	5-10	5-10	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	1- 5	1- 5	2- 5
Spiny menodora	MESP2	10-30	---	10-30	---	---	10-25
Bailey greasewood	SAVEB	5-15	---	5-15	---	---	5-10
Shadscale	ATCO	5-15	---	5-15	---	---	2- 5
Bud sagebrush	ARSP5	5-10	5-10	5-10	10-15	2- 5	2- 5
Nevada ephedra	EPNE	5-10	2- 5	5-10	1- 5	5-10	5-10
Black sagebrush	ARARN	---	20-25	---	---	15-20	---
Winterfat	EULA5	---	2- 5	---	20-30	2- 5	---
Fourwing saltbush	ATCA2	---	---	---	2-10	---	---
Anderson wolfberry	LYAN	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	10-20	10-15	10-20	15-25
Range site number		029X036N	029X008N	029X036N	029X020N	029X014N	029X037N
Potential production (lb/acre):							
Favorable years		400	700	400	400	500	300
Normal years		300	400	300	250	300	200
Unfavorable years		100	200	100	100	100	100

## 1329--Belted-Koyen association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Belted	Koyen	1	2	3	4
Galleta	HIJA	10-25	10-25	---	5-20	---	---
Indian ricegrass	ORHY	5-10	5-10	2- 5	5-15	2- 5	---
Bottlebrush squirreltail	SIHY	2- 5	2- 5	1- 2	2- 5	1- 2	---
Needlegrass	STIPA	2- 5	2- 5	---	5-10	---	---
Dropseed	SPORO	2- 5	2- 5	---	---	---	---
King desertgrass	BLKI	---	---	1- 2	---	1- 2	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-15	5-15	1- 5	5-10	1- 5	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	4-10	4-10	2- 5	5-10	2- 5	2- 5
Annual forbs	AAFF	1- 5	1- 5	1- 5	2- 5	1- 5	2- 5
Shadscale	ATCO	10-25	10-25	40-60	15-25	40-60	---
Bailey greasewood	SAVEB	5-10	5-10	10-15	5-15	10-15	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	2- 5	2- 5	---
Winterfat	EULA5	5-10	5-10	---	---	---	---
Nevada ephedra	EPNE	1- 5	1- 5	---	2- 5	---	---
Nevada dalea	DAPO2	---	---	5-10	---	5-10	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	10-20
Other shrubs	SSSS	10-20	10-20	5-15	10-20	5-15	5-15
Range site number		029X017N	029X017N	029X033N	029X022N	029X033N	027X029N
Potential production (lb/acre):							
Favorable years		350	350	100	300	100	800
Normal years		250	250	50	200	50	500
Unfavorable years		100	100	25	100	25	100

1340--Barnmot-Belted association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Barnmot	Belted	1	2	3	4
Galleta	HIJA	5-20	5-10	---	10-20	5-15	---
Indian ricegrass	ORHY	5-15	5-20	2- 5	2- 5	5-10	---
Needlegrass	STIPA	5-10	---	---	5-10	2-10	---
Bottlebrush squirreltail	SIHY	2- 5	---	1- 2	---	1- 5	---
King desertgrass	BLKI	---	---	1- 2	---	---	---
Bluegrass	POA++	---	---	---	---	2-10	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-10	1- 5	5-10	10-15	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	5-10	2- 5	5-10	5-10	2- 5
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	1- 5	2- 5
Shadscale	ATCO	15-25	5-15	40-60	2- 5	---	---
Bailey greasewood	SAVEB	5-15	5-15	10-15	5-10	---	---
Nevada ephedra	EPNE	2- 5	5-10	---	5-10	5-10	---
Bud sagebrush	ARSP5	2- 5	5-10	2- 5	2- 5	2- 5	---
Spiny menodora	MESP2	---	10-30	---	10-25	---	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	---
Anderson wolfberry	LYAN	---	---	---	5-10	---	---
Black sagebrush	ARARN	---	---	---	---	15-20	---
Winterfat	EULA5	---	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	10-20
Other shrubs	SSSS	10-20	10-20	5-15	15-25	10-20	5-15

Range site number	029X022N	029X036N	029X033N	029X037N	029X044N	027X029N
Potential production (lb/acre):						
Favorable years	300	400	100	300	500	800
Normal years	200	300	50	200	300	500
Unfavorable years	100	100	25	100	100	100

1341--Barnmot-Haarvar association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Barnmot	Haarvar	1	2	3	4
Galleta	HIJA	5-20	5-15	---	---	---	5-15
Indian ricegrass	ORHY	5-15	5-10	5-15	---	---	5-10
Needlegrass	STIPA	5-10	2-10	---	---	---	2-10
Bottlebrush squirreltail	SIHY	2- 5	1- 5	5-10	---	---	1- 5
Bluegrass	POA++	---	2-10	---	---	---	---
Pine bluegrass	POSC	---	---	5-15	---	---	---
Needleandthread	STCO4	---	---	2-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---	---
Basin wildrye	ELCI2	---	---	---	2- 5	---	---
Other perennial grasses	PPGG	5-10	10-15	5-10	10-25	---	10-20
Annual grasses	AAGG	1- 5	1- 5	---	---	---	1- 5
Perennial forbs	PPFF	5-10	5-10	5-10	2- 5	---	5-10
Annual forbs	AAFF	2- 5	1- 5	---	2- 5	---	2- 5
Shadscale	ATCO	15-25	---	---	---	---	---
Bailey greasewood	SAVEB	5-15	---	---	---	---	---
Nevada ephedra	EPNE	2- 5	5-10	5-10	---	---	2- 5
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	---	---
Black sagebrush	ARARN	---	15-20	---	---	---	---
Winterfat	EULA5	---	2- 5	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	---	---	10-20	---	---	15-20
Spiny hopsage	GRSP	---	---	10-20	10-20	---	2- 5
Big sagebrush	ARTR2	---	---	---	10-30	---	---
Rabbitbrush	CHRY9	---	---	---	10-30	---	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	5-15	5-15	---	10-25

Range site number	029X022N	029X014N	027X008N	027X029N	None	029X006N
Potential production (lb/acre):						
Favorable years	300	500	700	800	---	800
Normal years	200	300	500	500	---	500
Unfavorable years	100	100	300	100	---	300

1342--Barnmot-Badland association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Barnmot	Badland	1
Indian ricegrass	ORHY	5-20	---	1-10
Desert needlegrass	STSP3	2-10	---	---
King desertgrass	BLKI	---	---	1- 2
Other perennial grasses	PPGG	2- 5	---	5-10
Annual grasses	AAGG	---	---	1- 5
Perennial forbs	PPFF	5-10	---	5-10
Annual forbs	AAFF	---	---	2- 5
Shadscale	ATCO	10-20	---	20-40
Bailey greasewood	SAVEB	5-15	---	10-15
Bud sagebrush	ARSP5	2-10	---	---
Nevada ephedra	EPNE	2- 5	---	---
Cooper wolfberry	LYCO2	---	---	5-15
Other shrubs	SSSS	5-10	---	5-15
Range site number		027X027N	None	029X032N
Potential production (lb/acre):				
Favorable years		200	---	150
Normal years		100	---	100
Unfavorable years		50	---	50

1350--Calpeak-Gabbvally-Tejabe association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Calpeak	Gabbvally	Tejabe	1	2	3	4
Galleta	HIJA	5-15	5-15	---	---	5-15	---	---
Needlegrass	STIPA	5-10	5-10	5-15	---	2-10	---	---
Indian ricegrass	ORHY	5-10	5-10	---	---	5-10	10-20	---
Bottlebrush squirreltail	SIHY	1- 4	1- 4	---	---	1- 5	5-10	---
Pine bluegrass	POSC	---	---	20-30	---	---	---	---
Bluegrass	POA++	---	---	---	---	2-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-20	5-20	5-15	---	10-15	5-10	10-25
Annual grasses	AAGG	1- 5	1- 5	---	---	1- 5	---	---
Perennial forbs	PPFF	4-10	4-10	5-10	---	5-10	3- 7	2- 5
Annual forbs	AAFF	2- 7	2- 7	---	---	1- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	20-30	20-30	10-20	---	---	---	---
Nevada ephedra	EPNE	5-10	5-10	5-10	---	5-10	---	---
Spiny hopsage	GRSP	---	---	5-15	---	---	---	10-20
Black sagebrush	ARARN	---	---	---	---	15-20	---	---
Bud sagebrush	ARSP5	---	---	---	---	2- 5	5-15	---
Winterfat	EULA5	---	---	---	---	2- 5	---	---
Shadscale	ATCO	---	---	---	---	---	15-30	---
Bailey greasewood	SAVEB	---	---	---	---	---	10-20	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	10-20	5-10	---	10-20	5-10	5-15
Range site number		029X010N	029X010N	027X007N	None	029X014N	027X018N	027X029N
Potential production (lb/acre):								
Favorable years		600	600	600	---	500	500	800
Normal years		400	400	450	---	300	300	500
Unfavorable years		200	200	300	---	100	100	100

1351--Calpeak-Goldyke association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Calpeak	Goldyke	1	2	3	4
Galleta	HIJA	5-15	5-20	---	---	10-25	---
Needlegrass	STIPA	5-10	5-10	---	---	2- 5	5-15
Indian ricegrass	ORHY	5-10	5-15	2- 5	---	5-10	---
Bottlebrush squirreltail	SIHY	1- 4	2- 5	1- 2	---	2- 5	---
King desertgrass	BLKI	---	---	1- 2	---	---	---
Dropseed	SPORO	---	---	---	---	2- 5	---
Pine bluegrass	POSC	---	---	---	---	---	20-30
Other perennial grasses	PPGG	5-20	5-10	1- 5	---	5-15	5-15
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	---
Perennial forbs	PPFF	4-10	5-10	2- 5	---	4-10	5-10
Annual forbs	AAFF	2- 7	2- 5	1- 5	---	1- 5	---
Wyoming big sagebrush	ARTRW	20-30	---	---	---	---	10-20
Nevada ephedra	EPNE	5-10	2- 5	---	---	1- 5	5-10
Shadscale	ATCO	---	15-25	40-60	---	10-25	---
Bailey greasewood	SAVEB	---	5-15	10-15	---	5-10	---
Bud sagebrush	ARSP5	---	2- 5	2- 5	---	5-10	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	---
Winterfat	EULA5	---	---	---	---	5-10	---
Spiny hopsage	GRSP	---	---	---	---	---	5-15
Other shrubs	SSSS	10-20	10-20	5-15	---	10-20	5-10
Range site number		029X010N	029X022N	029X033N	None	029X017N	027X007N
Potential production (lb/acre):							
Favorable years		600	300	100	---	350	600
Normal years		400	200	50	---	250	450
Unfavorable years		200	100	25	---	100	300

1353--Calpeak-Goldyke-Gabbvally association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Calpeak	Goldyke	Gabbvally	1	2	3	4
Galleta	HIJA	5-15	5-20	5-15	5-15	---	---	---
Needlegrass	STIPA	5-10	5-10	5-10	2-10	---	---	5-15
Indian ricegrass	ORHY	5-10	5-15	5-10	5-10	---	---	---
Bottlebrush squirreltail	SIHY	1- 4	2- 5	1- 4	1- 5	---	---	---
Bluegrass	POA++	---	---	---	2-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	---	2- 5	---
Pine bluegrass	POSC	---	---	---	---	---	---	20-30
Other perennial grasses	PPGG	5-20	5-10	5-20	10-15	---	10-25	5-15
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	---	---	---
Perennial forbs	PPFF	4-10	5-10	4-10	5-10	---	2- 5	5-10
Annual forbs	AAFF	2- 7	2- 5	2- 7	1- 5	---	2- 5	---
Wyoming big sagebrush	ARTRW	20-30	---	20-30	---	---	---	10-20
Nevada ephedra	EPNE	5-10	2- 5	5-10	5-10	---	---	5-10
Shadscale	ATCO	---	15-25	---	---	---	---	---
Bailey greasewood	SAVEB	---	5-15	---	---	---	---	---
Bud sagebrush	ARSP5	---	2- 5	---	2- 5	---	---	---
Black sagebrush	ARARN	---	---	---	15-20	---	---	---
Winterfat	EULA5	---	---	---	2- 5	---	---	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30	---
Rabbitbrush	CHRY59	---	---	---	---	---	10-30	---
Spiny hopsage	GRSP	---	---	---	---	---	10-20	5-15
Other shrubs	SSSS	10-20	10-20	10-20	10-20	---	5-15	5-10
Range site number		029X010N	029X022N	029X010N	029X014N	None	027X029N	027X007N
Potential production (lb/acre):								
Favorable years		600	300	600	500	---	800	600
Normal years		400	200	400	300	---	500	450
Unfavorable years		200	100	200	100	---	100	300

1354--Calpeak-Lomoine association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Calpeak	Lomoine	1	2	3	4
Galleta	HIJA	5-15	5-15	---	---	---	5-15
Needlegrass	STIPA	5-10	2-10	---	---	---	---
Indian ricegrass	ORHY	5-10	5-10	---	---	X	5-10
Bottlebrush squirreltail	SIHY	1- 4	1- 5	---	---	X	---
Bluegrass	POA++	---	2-10	---	---	---	---
Sandberg bluegrass	POSE	---	---	2- 5	---	---	---
Basin wildrye	ELCI2	---	---	2- 5	---	---	---
Desert needlegrass	STSP3	---	---	---	---	---	20-40
Other perennial grasses	PPGG	5-20	10-15	10-25	---	X	5-10
Annual grasses	AAGG	1- 5	1- 5	---	---	---	---
Perennial forbs	PPFF	4-10	5-10	2- 5	---	X	2- 5
Annual forbs	AAFF	2- 7	1- 5	2- 5	---	---	---
Wyoming big sagebrush	ARTRW	20-30	---	---	---	X	15-25
Nevada ephedra	EPNE	5-10	5-10	---	---	X	5-15
Black sagebrush	ARARN	---	15-20	---	---	X	---
Bud sagebrush	ARSP5	---	2- 5	---	---	---	---
Winterfat	EULA5	---	2- 5	---	---	---	---
Big sagebrush	ARTR2	---	---	10-30	---	---	---
Rabbitbrush	CHRYS9	---	---	10-30	---	---	---
Spiny hopsage	GRSP	---	---	10-20	---	---	5-15
Green ephedra	EPVI	---	---	---	---	X	---
Other shrubs	SSSS	10-20	10-20	5-15	---	X	5-10
Utah juniper	JUOS	---	---	---	---	X	---
Singleleaf pinyon	PIMO	---	---	---	---	X	---

Range site number	029X010N	029X014N	027X029N	None	029X081N	027X065N
Potential production (lb/acre):						
Favorable years	600	500	800	---	125	500
Normal years	400	300	500	---	75	300
Unfavorable years	200	100	100	---	25	200

## 1361--Gabbvally-Tejabe-Mirkwood association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Gabbvally	Tejabe	Mirkwood	1	2	3	4
Galleta	HIJA	5-15	---	---	---	---	5-15	---
Needlegrass	STIPA	5-10	5-15	---	---	---	2-10	---
Indian ricegrass	ORHY	5-10	---	5-10	---	- 5	5-10	---
Bottlebrush squirreltail	SIHY	1- 4	---	2- 5	---	- 2	1- 5	---
Pine bluegrass	POSC	---	20-30	---	---	---	---	---
Desert needlegrass	STSP3	---	---	20-30	---	---	---	---
Sandberg bluegrass	POSE	---	---	2- 5	---	---	---	2- 5
King desertgrass	BLKI	---	---	---	---	1- 2	---	---
Bluegrass	POA++	---	---	---	---	---	2-10	---
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-20	5-15	2- 5	---	1- 5	10-15	10-25
Annual grasses	AAGG	1- 5	---	---	---	1- 5	1- 5	---
Perennial forbs	PPFF	4-10	5-10	5-10	---	2- 5	5-10	2- 5
Annual forbs	AAFF	2- 7	---	---	---	1- 5	1- 5	2- 5
Wyoming big sagebrush	ARTRW	20-30	10-20	---	---	---	---	---
Nevada ephedra	EPNE	5-10	5-10	---	---	---	5-10	---
Spiny hopsage	GRSP	---	5-15	---	---	---	---	10-20
Littleleaf horsebrush	TEGL	---	---	10-20	---	---	---	---
Shadscale	ATCO	---	---	5-15	---	40-60	---	---
Bailey greasewood	SAVEB	---	---	---	---	10-15	---	---
Nevada dalea	DAPO2	---	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---	---
Bud sagebrush	ARSP5	---	---	---	---	2- 5	2- 5	---
Black sagebrush	ARARN	---	---	---	---	---	15-20	---
Winterfat	EULA5	---	---	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY59	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	5-10	5-15	---	5-15	10-20	5-15
Range site number		029X010N	027X007N	027X017N	None	029X033N	029X014N	027X029N
Potential production (lb/acre):								
Favorable years		600	600	400	---	100	500	800
Normal years		400	450	200	---	50	300	500
Unfavorable years		200	300	100	---	25	100	100

1362--Gabbvally-Gabbvally, very steep-Stewval association

(An X indicates that the named plant is in the potential woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Gabbvally	Gabbvally, very steep	Stewval	1	2	3	4
Galleta	HIJA	5-15	5-15	5-15	---	10-20	---	5-15
Needlegrass	STIPA	5-10	5-10	2-10	---	5-10	---	5-10
Indian ricegrass	ORHY	5-10	5-10	5-10	---	2- 5	---	5-10
Bottlebrush squirreltail	SIHY	1- 4	1- 4	1- 5	---	---	X	1- 4
Bluegrass	POA++	---	---	2-10	---	---	---	---
Pine bluegrass	POSC	---	---	---	---	---	X	---
Other perennial grasses	PPGG	5-20	5-20	10-15	---	5-10	X	5-20
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	---	1- 5
Perennial forbs	PPFF	4-10	4-10	5-10	---	5-10	X	4-10
Annual forbs	AAFF	2- 7	2- 7	1- 5	---	2- 5	---	2- 7
Wyoming big sagebrush	ARTRW	20-30	20-30	---	---	---	X	20-30
Nevada ephedra	EPNE	5-10	5-10	5-10	---	5-10	---	5-10
Black sagebrush	ARARN	---	---	15-20	---	---	---	---
Bud sagebrush	ARSP5	---	---	2- 5	---	2- 5	---	---
Winterfat	EULA5	---	---	2- 5	---	---	---	---
Spiny menodora	MESP2	---	---	---	---	10-25	---	---
Bailey greasewood	SAVEB	---	---	---	---	5-10	---	---
Anderson wolfberry	LYAN	---	---	---	---	5-10	---	---
Shadscale	ATCO	---	---	---	---	2- 5	---	---
Mountain big sagebrush	ARTRV	---	---	---	---	---	X	---
Green ephedra	EPVI	---	---	---	---	---	X	---
Other shrubs	SSSS	10-20	10-20	10-20	---	15-25	X	10-20
Singleleaf pinyon	PIMO	---	---	---	---	---	X	---
Utah juniper	JUOS	---	---	---	---	---	X	---

Range site number	029X010N	029X010N	029X014N	None	029X032N	026X062N	029X010N
Potential production (lb/acre):							
Favorable years	600	600	500	---	300	250	600
Normal years	400	400	300	---	200	200	400
Unfavorable years	200	200	100	---	100	150	200

1363--Gabbvally very stony loam, moist, 15 to 50 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Gabbvally	1	2	3	4
Galleta	HIJA	5-15	---	---	---	---
Needlegrass	STIPA	5-10	5-15	---	---	---
Indian ricegrass	ORHY	5-10	---	---	---	X
Bottlebrush squirreltail	SIHY	1- 4	---	---	X	X
Pine bluegrass	POSC	---	20-30	---	X	---
Other perennial grasses	PPGG	5-20	5-15	---	X	X
Annual grasses	AAGG	1- 5	---	---	---	---
Perennial forbs	PPFF	4-10	5-10	---	X	X
Annual forbs	AAFF	2- 7	---	---	---	---
Wyoming big sagebrush	ARTRW	20-30	10-20	---	X	X
Nevada ephedra	EPNE	5-10	5-10	---	---	X
Spiny hopsage	GRSP	---	5-15	---	---	---
Mountain big sagebrush	ARTRV	---	---	---	X	---
Green ephedra	EPVI	---	---	---	X	X
Black sagebrush	ARARN	---	---	---	---	X
Other shrubs	SSSS	10-20	5-10	---	X	X
Singleleaf pinyon	PIMO	---	---	---	X	X
Utah juniper	JUOS	---	---	---	X	X
Range site number		029X010N	027X007N	None	026X062N	029X081N
Potential production (lb/acre):						
Favorable years		600	600	---	250	125
Normal years		400	450	---	200	75
Unfavorable years		200	300	---	150	25

1365--Gabbvally-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Gabbvally	Rock outcrop	1	2
Galleta	HIJA	5-15	---	5-15	---
Needlegrass	STIPA	5-10	---	5-10	---
Indian ricegrass	ORHY	5-10	---	5-10	X
Bottlebrush squirreltail	SIHY	1- 4	---	1- 4	X
Other perennial grasses	PPGG	5-20	---	5-20	X
Annual grasses	AAGG	1- 5	---	1- 5	---
Perennial forbs	PPFF	4-10	---	4-10	X
Annual forbs	AAFF	2- 7	---	2- 7	---
Wyoming big sagebrush	ARTRW	20-30	---	20-30	X
Nevada ephedra	EPNE	5-10	---	5-10	X
Black sagebrush	ARARN	---	---	---	X
Green ephedra	EPVI	---	---	---	X
Other shrubs	SSSS	10-20	---	10-20	X
Utah juniper	JUOS	---	---	---	X
Singleleaf pinyon	PIMO	---	---	---	X

Range site number	029X010N	None	029X010N	029X081N
Potential production (lb/acre):				
Favorable years	600	---	600	125
Normal years	400	---	400	75
Unfavorable years	200	---	200	25

1366--Gabbvally-Beelem-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Gabbvally	Beelem	Rock outcrop	1	2	3
Galleta	HIJA	5-15	---	---	10-20	5-10	---
Needlegrass	STIPA	5-10	---	---	5-10	---	---
Indian ricegrass	ORHY	5-10	X	---	2- 5	5-20	---
Bottlebrush squirreltail	SIHY	1- 4	X	---	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-20	X	---	5-10	5-10	10-25
Annual grasses	AAGG	1- 5	---	---	1- 5	1- 5	---
Perennial forbs	PPFF	4-10	X	---	5-10	5-10	2- 5
Annual forbs	AAFF	2- 7	---	---	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	20-30	X	---	---	---	---
Nevada ephedra	EPNE	5-10	X	---	5-10	5-10	---
Black sagebrush	ARARN	---	X	---	---	---	---
Green ephedra	EPVI	---	X	---	---	---	---
Bud sagebrush	ARSP5	---	---	---	2- 5	5-10	---
Spiny menodora	MESP2	---	---	---	10-25	10-30	---
Bailey greasewood	SAVEB	---	---	---	5-10	5-15	---
Anderson wolfberry	LYAN	---	---	---	5-10	---	---
Shadscale	ATCO	---	---	---	2- 5	5-15	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	10-20
Other shrubs	SSSS	10-20	X	---	15-25	10-20	5-15
Utah juniper	JUOS	---	X	---	---	---	---
Singleleaf pinyon	PIMO	---	X	---	---	---	---
Range site number		029X010N	029X081N	None	029X037N	029X036N	027X029N
Potential production (lb/acre):							
Favorable years		600	125	---	300	400	800
Normal years		400	75	---	200	300	500
Unfavorable years		200	25	---	100	100	100

1420--Dedmount-Slaw association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Dedmount	Slaw	1	2	3	4
Basin wildrye	ELCI2	15-25	---	2- 5	---	---	30-50
Alkali sacaton	SPAI	5-10	---	15-40	---	---	5-10
Bottlebrush squirreltail	SIHY	5-10	---	---	---	---	---
Inland saltgrass	DIST	---	5-10	10-15	---	---	5-10
Baltic rush	JUBA	---	---	5-15	---	---	---
Common reed	PHCO15	---	---	2- 5	---	---	---
Alkali cordgrass	SPGR	---	---	2- 5	---	---	---
Indian ricegrass	ORHY	---	---	---	10-20	---	---
Needleandthread	STCO4	---	---	---	5-10	---	---
Creeping wildrye	ELTR3	---	---	10-20	2- 5	---	---
Other annual grasses	AAGG	---	---	2- 6	---	---	---
Perennial forbs	PPFF	5-10	3- 7	2- 6	2- 5	---	5-10
Annual forbs	AAFF	2- 5	---	1- 5	2- 5	---	---
Torrey quailbush	ATTO	40-60	---	---	---	---	---
Black greasewood	SAVE4	5-15	40-60	---	10-40	---	5-15
Fourwing saltbush	ATCA2	2- 5	---	---	---	---	---
Shadscale	ATCO	2- 5	2-10	---	---	---	5-15
Seepweed	SUAED	---	2- 5	---	---	---	---
Basin big sagebrush	ARTRT	---	---	---	---	---	2- 5
Rubber rabbitbrush	CHNA2	---	---	---	---	---	2- 5
Other shrubs	SSSS	5-10	5-15	2-10	5-20	---	5-10
Range site number		027X041N	027X025N	029X002N	027X016N	None	027X006N
Potential production (lb/acre):							
Favorable years		1,500	400	3,300	300	---	2,000
Normal years		1,000	200	2,200	200	---	1,500
Unfavorable years		600	50	1,000	50	---	1,000

## 1440--Slaw-Isolde-Cirac association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Slaw	Isolde	Cirac	1	2
Inland saltgrass	DIST	5-10	---	5-10	---	---
Indian ricegrass	ORHY	---	10-20	---	---	10-20
Needleandthread	STCO4	---	5-10	---	---	---
Bottlebrush squirreltail	SIHY	---	---	---	---	5-10
Other perennial grasses	PPGG	5-15	2- 5	5-15	---	5-10
Perennial forbs	PPFF	3- 7	2- 5	3- 7	---	3- 7
Annual forbs	AAFF	---	2- 5	---	---	2- 5
Black greasewood	SAVE4	40-60	10-40	40-60	---	---
Shadscale	ATCO	2-10	---	2-10	---	10-20
Seepweed	SUAED	2- 5	---	2- 5	---	---
Cooper wolfberry	LYCO2	---	---	---	---	5-20
Bailey greasewood	SAVEB	---	---	---	---	5-10
Other shrubs	SSSS	5-15	5-20	5-15	---	5-15
Range site number		027X025N	027X016N	027X015N	None	027X043N
Potential production (lb/acre):						
Favorable years		400	300	400	---	400
Normal years		200	200	200	---	200
Unfavorable years		50	50	50	---	100

1441--Slaw silt loam, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Slaw	1	2	3
Inland saltgrass	DIST	5-10	---	---	---
Indian ricegrass	ORHY	---	10-20	10-20	---
Bottlebrush squirreltail	SIHY	---	5-10	---	---
Needleandthread	STCO4	---	---	5-10	---
Other perennial grasses	PPGG	5-15	5-10	2- 5	---
Perennial forbs	PPFF	3- 7	3- 7	2- 5	---
Annual forbs	AAFF	---	2- 5	2- 5	---
Black greasewood	SAVE4	40-60	---	10-40	---
Shadscale	ATCO	2-10	10-20	---	---
Seepweed	SUAED	2- 5	---	---	---
Cooper wolfberry	LYCO2	---	5-20	---	---
Bailey greasewood	SAVEB	---	5-10	---	---
Other shrubs	SSSS	5-15	5-15	5-20	---
Range site number		027X025N	027X043N	027X016N	None
Potential production (lb/acre):					
Favorable years		400	400	300	---
Normal years		200	200	200	---
Unfavorable years		50	100	50	---

1442--Slaw-Playas association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Slaw	Playas	1	2
Inland saltgrass	DIST	5-10	---	---	---
Indian ricegrass	ORHY	---	---	10-20	10-20
Needleandthread	STCO4	---	---	5-10	---
Bottlebrush squirreltail	SIHY	---	---	---	5-10
Other perennial grasses	PPGG	5-15	---	2- 5	5-10
Perennial forbs	PPFF	3- 7	---	2- 5	3- 7
Annual forbs	AAFF	---	---	2- 5	2- 5
Black greasewood	SAVE4	40-60	---	10-40	---
Shadscale	ATCO	2-10	---	---	10-20
Seepweed	SUAED	2- 5	---	---	---
Cooper wolfberry	LYCO2	---	---	---	5-20
Bailey greasewood	SAVEB	---	---	---	5-10
Other shrubs	SSSS	5-15	---	5-20	5-15
Range site number		027X025N	None	027X016N	027X043N
Potential production (lb/acre):					
Favorable years		400	---	300	400
Normal years		200	---	200	200
Unfavorable years		50	---	50	100

1445--Slaw, reclaimed-Slaw-Fallon complex, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Slaw, reclaimed	Slaw	Fallon	1	2	3	4
Basin wildrye	ELCI2	---	15-25	15-25	15-25	15-25	---	---
Alkali sacaton	SPAI	---	5-10	5-10	5-10	5-10	---	---
Bottlebrush squirreltail	SIHY	---	5-10	5-10	5-10	5-10	---	---
Indian ricegrass	ORHY	---	---	---	---	---	30-50	---
Needleandthread	STCO4	---	---	---	---	---	2-10	---
Other perennial grasses	PFGG	---	5-10	5-10	5-10	5-10	2-10	---
Perennial forbs	PFFF	---	5-10	5-10	5-10	5-10	2- 5	---
Annual forbs	AAFF	---	2- 5	2- 5	2- 5	2- 5	2- 5	---
Torrey quailbush	ATTO	---	40-60	40-60	40-60	40-60	---	---
Black greasewood	SAVE4	---	5-15	5-15	5-15	5-15	---	---
Fourwing saltbush	ATCA2	---	2- 5	2- 5	2- 5	2- 5	5-15	---
Shadscale	ATCO	---	2- 5	2- 5	2- 5	2- 5	---	---
Winterfat	EULA5	---	---	---	---	---	2-10	---
Nevada dalea	DAPO2	---	---	---	---	---	2-10	---
Other shrubs	SSSS	---	5-10	5-10	5-10	5-10	5-10	---

Range site number	None	027X041N	027X041N	027X041N	027X041N	027X009N	None
Potential production (lb/acre):							
Favorable years	---	1,500	1,500	1,500	1,500	800	---
Normal years	---	1,000	1,000	1,000	1,000	450	---
Unfavorable years	---	600	600	600	600	200	---

1450--Nuyobe-Playas association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Nuyobe	Playas	1	2	3
Alkali sacaton	SPAI	20-30	---	40-70	---	5-10
Inland saltgrass	DIST	10-20	---	2-15	---	---
Basin wildrye	ELCI2	5-15	---	2- 5	---	15-25
Creeping wildrye	ELTR3	5-10	---	---	---	---
Baltic rush	JUBA	5-10	---	---	---	---
Indian ricegrass	ORHY	---	---	---	10-20	---
Needleandthread	STCO4	---	---	---	5-10	---
Bottlebrush squirreltail	SIHY	---	---	---	---	5-10
Other perennial grasses	PPGG	5-10	---	2- 5	2- 5	5-10
Perennial forbs	PPFF	5-10	---	2- 8	2- 5	5-10
Annual forbs	AAFF	2- 5	---	---	2- 5	2- 5
Black greasewood	SAVE4	5-10	---	2- 5	10-40	5-15
Iodinebush	ALOC2	2- 5	---	10-20	---	---
Seepweed	SUAED	2- 5	---	---	---	---
Nuttall saltbush	ATNU2	---	---	5-10	---	---
Torrey quailbush	ATTO	---	---	---	---	40-60
Fourwing saltbush	ATCA2	---	---	---	---	2- 5
Shadscale	ATCO	---	---	---	---	2- 5
Other shrubs	SSSS	5-10	---	4- 8	5-20	5-10
Trees	TTTT	5-10	---	---	---	---
Range site number		027X005N	None	024X010N	027X016N	027X041N
Potential production (lb/acre):						
Favorable years		2,000	---	450	300	1,500
Normal years		1,500	---	300	200	1,000
Unfavorable years		1,000	---	150	50	600

1451--Nuyobe-Slaw association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Nuyobe	Slaw	1	2
Basin wildrye	ELCI2	30-50	---	2- 5	---
Inland saltgrass	DIST	5-10	5-10	10-15	---
Alkali sacaton	SPAI	5-10	---	15-40	---
Creeping wildrye	ELTR3	5-10	---	---	---
Baltic rush	JUBA	---	---	5-15	---
Common reed	PHCO15	---	---	2- 5	---
Alkali cordgrass	SPGR	---	---	2- 5	---
Indian ricegrass	ORHY	---	---	---	10-20
Needleandthread	STCO4	---	---	---	5-10
Other perennial grasses	PPGG	---	5-15	10-20	2- 5
Annual grasses	AAGG	---	---	2- 6	---
Perennial forbs	PPFF	5-10	3- 7	2- 6	2- 5
Annual forbs	AAFF	---	---	1- 5	2- 5
Black greasewood	SAVE4	5-15	40-60	---	10-40
Shadscale	ATCO	5-15	2-10	---	---
Basin big sagebrush	ARTRT	2- 5	---	---	---
Rubber rabbitbrush	CHNA2	2- 5	---	---	---
Seepweed	SUAED	---	2- 5	---	---
Other shrubs	SSSS	5-10	5-15	2-10	5-20

Range site number	027X006N	027X025N	029X002N	027X016N
Potential production (lb/acre):				
Favorable years	2,000	400	3,300	300
Normal years	1,500	200	2,200	200
Unfavorable years	1,000	50	1,000	50

1480--Fawin-Crunker association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Fawin	Crunker	1	2	3	4
Galleta	HIJA	5-20	5-25	5-20	---	5-15	5-20
Indian ricegrass	ORHY	5-15	5-15	5-20	---	5-10	5-15
Needlegrass	STIPA	2-10	5-15	---	---	2-10	2-10
Dropseed	SPORO	5-10	5-10	2-10	---	---	5-10
Bottlebrush squirreltail	SIHY	1- 5	1- 5	---	---	1- 5	1- 5
Sandberg bluegrass	POSE	---	---	---	2- 5	---	---
Basin wildrye	ELCI2	---	---	---	2- 5	---	---
Other perennial grasses	PPGG	5-10	5-20	5-15	10-25	10-20	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 5	---	1- 5	1- 5
Perennial forbs	PPFF	5-10	3-10	5-10	2- 5	5-10	5-10
Annual forbs	AAFF	1- 5	2- 5	1- 5	2- 5	2- 5	1- 5
Winterfat	EULA5	20-30	2-10	---	---	2- 5	20-30
Bud sagebrush	ARSP5	10-15	5-10	5-20	---	---	10-15
Fourwing saltbush	ATCA2	2-10	---	---	---	5-10	2-10
Nevada ephedra	EPNE	1- 5	---	2- 5	---	2- 5	1- 5
Wyoming big sagebrush	ARTRW	---	15-20	---	---	15-20	---
Spiny hopsage	GRSP	---	5-10	10-20	10-20	2- 5	---
Anderson wolfberry	LYAN	---	---	5-15	---	---	---
Nevada dalea	DAPO2	---	---	2-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	---
Big sagebrush	ARTR2	---	---	---	10-30	---	---
Rabbitbrush	CHRYS9	---	---	---	10-30	---	---
Other shrubs	SSSS	10-15	10-20	10-20	5-15	10-25	10-15

Range site number	029X020N	029X049N	029X016N	027X029N	029X006N	029X020N
Potential production (lb/acre):						
Favorable years	400	900	400	800	800	400
Normal years	250	600	300	500	500	250
Unfavorable years	100	300	200	100	300	100

1482--Fawin-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Fawin	Izo	1	2
Galleta	HIJA	5-20	---	---	5-10
Indian ricegrass	ORHY	5-15	5-10	---	5-20
Needlegrass	STIPA	2-10	---	---	---
Dropseed	SPORO	5-10	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	---
Sandberg bluegrass	POSE	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	2- 5	---
Other perennial grasses	PPGG	5-10	5-10	10-25	5-10
Annual grasses	AAGG	1- 5	2- 4	---	1- 5
Perennial forbs	PPFF	5-10	2- 6	2- 5	5-10
Annual forbs	AAFF	1- 5	1- 5	2- 5	2- 5
Winterfat	EULA5	20-30	---	---	---
Bud sagebrush	ARSP5	10-15	---	---	5-10
Fourwing saltbush	ATCA2	2-10	5-15	---	---
Nevada ephedra	EPNE	1- 5	2- 5	---	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Bailey greasewood	SAVEB	---	2-10	---	5-15
Cooper wolfberry	LYCO2	---	2- 5	---	---
Big sagebrush	ARTR2	---	---	10-30	---
Rabbitbrush	CHRY59	---	---	10-30	---
Spiny hopsage	GRSP	---	---	10-20	---
Spiny menodora	MESP2	---	---	---	10-30
Shadscale	ATCO	---	---	---	5-15
Other shrubs	SSSS	10-15	10-20	5-15	10-20

Range site number	029X020N	029X041N	027X029N	029X036N
Potential production (lb/acre):				
Favorable years	400	500	800	400
Normal years	250	300	500	300
Unfavorable years	100	100	100	100

1483--Fawin fine sandy loam, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Fawin	1	2	3
Galleta	HIJA	5-20	5-20	---	---
Indian ricegrass	ORHY	5-15	5-15	5-10	5-10
Needlegrass	STIPA	2-10	2-10	---	---
Dropseed	SPORO	5-10	5-10	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	---	2- 5
Other perennial grasses	PPGG	5-10	5-10	5-10	2- 5
Annual grasses	AAGG	1- 5	1- 5	2- 4	---
Perennial forbs	PPFF	5-10	5-10	2- 6	5-10
Annual forbs	AAFF	1- 5	1- 5	1- 5	---
Winterfat	EULA5	20-30	20-30	---	---
Bud sagebrush	ARSP5	10-15	10-15	---	---
Fourwing saltbush	ATCA2	2-10	2-10	5-15	---
Nevada ephedra	EPNE	1- 5	1- 5	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---
Burrobrush	HYMEN3	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	5-10	---
Bailey greasewood	SAVEB	---	---	2-10	---
Cooper wolfberry	LYCO2	---	---	2- 5	5-15
Black greasewood	SAVE4	---	---	---	30-40
Shadscale	ATCO	---	---	---	10-20
Other shrubs	SSSS	10-15	10-15	10-20	2- 5
Range site number		029X020N	029X020N	029X041N	027X036N
Potential production (lb/acre):					
Favorable years		400	400	500	200
Normal years		250	250	300	100
Unfavorable years		100	100	100	50

1490--Rattleflat-Crunker association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Rattleflat	Crunker	1	2	3
Galleta	HIJA	5-25	5-25	5-25	5-20	---
Indian ricegrass	ORHY	5-15	5-15	5-15	5-15	---
Needlegrass	STIPA	5-15	5-15	5-15	2-10	---
Dropseed	SPORO	5-10	5-10	5-10	5-10	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5	1- 5	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-20	5-20	5-20	5-10	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	3-10	3-10	3-10	5-10	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5	1- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	15-20	---	---
Spiny hopsage	GRSP	5-10	5-10	5-10	---	10-20
Bud sagebrush	ARSP5	5-10	5-10	5-10	10-15	---
Winterfat	EULA5	2-10	2-10	2-10	20-30	---
Fourwing saltbush	ATCA2	---	---	---	2-10	---
Nevada ephedra	EPNE	---	---	---	1- 5	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	10-30
Other shrubs	SSSS	10-20	10-20	10-20	10-15	5-15
Range site number		O29X049N	O29X049N	O29X049N	O29X020N	O27X029N
Potential production (lb/acre):						
Favorable years		900	900	900	400	800
Normal years		600	600	600	250	500
Unfavorable years		300	300	300	100	100

1492--Rattleflat-Wiskiflat association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Rattleflat	Wiskiflat	1	2	3	4
Galleta	HIJA	5-25	---	5-15	---	5-25	5-25
Indian ricegrass	ORHY	5-15	2- 5	5-10	30-50	5-15	5-15
Needlegrass	STIPA	5-15	---	2-10	---	5-15	5-15
Dropseed	SPORO	5-10	---	---	---	5-10	5-10
Bottlebrush squirreltail	SIHY	1- 5	---	1- 5	---	1- 5	1- 5
Desert needlegrass	STSP3	---	30-40	---	---	---	---
Needleandthread	STCO4	---	---	---	2-10	---	---
Other perennial grasses	PPGG	5-20	5-15	10-20	2-10	5-20	5-20
Annual grasses	AAGG	1- 5	---	1- 5	---	1- 5	1- 5
Perennial forbs	PPFF	3-10	2- 5	5-10	2- 5	3-10	3-10
Annual forbs	AAFF	2- 5	---	2- 5	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	10-20	15-20	---	15-20	15-20
Spiny hopsage	GRSP	5-10	---	2- 5	---	5-10	5-10
Bud sagebrush	ARSP5	5-10	---	---	---	5-10	5-10
Winterfat	EULA5	2-10	---	2- 5	2-10	2-10	2-10
Nevada ephedra	EPNE	---	5-10	2- 5	---	---	---
Fourwing saltbush	ATCA2	---	---	5-10	5-15	---	---
Nevada dalea	DAPO2	---	---	---	2-10	---	---
Other shrubs	SSSS	10-20	5-15	10-25	5-10	10-20	10-20
Range site number		029X049N	027X067N	029X006N	027X009N	029X049N	029X049N
Potential production (lb/acre):							
Favorable years		900	800	800	800	900	900
Normal years		600	500	500	450	600	600
Unfavorable years		300	350	300	200	300	300

1500--Chuckridge-Crunker association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Chuckridge	Crunker	1	2	3	4
Galleta	HIJA	5-20	5-25	---	5-20	10-25	---
Needlegrass	STIPA	5-15	5-15	---	5-15	2- 5	---
Indian ricegrass	ORHY	5-10	5-15	15-25	5-10	5-10	---
Dropseed	SPORO	---	5-10	---	---	2- 5	---
Bottlebrush squirreltail	SIHY	---	1- 5	---	---	2- 5	---
Needleandthread	STCO4	---	---	5-10	---	---	---
Basin wildrye	ELCI2	---	---	2- 5	---	---	---
Other perennial grasses	PPGG	10-15	5-20	10-20	10-15	5-15	---
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	1- 5	---
Perennial forbs	PPFF	3- 8	3-10	5-10	3- 8	4-10	---
Annual forbs	AAFF	2- 5	2- 5	---	2- 5	1- 5	---
Black sagebrush	ARARN	20-25	---	20-30	20-25	---	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	5-10	5-10	---
Winterfat	EULA5	2- 5	2-10	5-10	2- 5	5-10	---
Nevada ephedra	EPNE	2- 5	---	---	2- 5	1- 5	---
Wyoming big sagebrush	ARTRW	---	15-20	---	---	---	---
Spiny hopsage	GRSP	---	5-10	---	---	---	---
Small rabbitbrush	CHVIS	---	---	2- 5	---	---	---
Shadscale	ATCO	---	---	---	---	10-25	---
Bailey greasewood	SAVEB	---	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20	---
Range site number		029X008N	029X049N	028B011N	029X008N	029X017N	None
Potential production (lb/acre):							
Favorable years		700	900	1,000	700	350	---
Normal years		400	600	700	400	250	---
Unfavorable years		200	300	400	200	100	---

1510--Advokay-Budihol-Pumel association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Advokay	Budihol	Pumel	1	2	3	4
Galleta	HIJA	10-25	---	10-20	5-20	---	---	---
Indian ricegrass	ORHY	5-10	---	2- 5	5-15	5-15	5-10	---
Bottlebrush squirreltail	SIHY	2- 5	---	---	2- 5	5-10	---	---
Needlegrass	STIPA	2- 5	5-15	5-10	5-10	---	---	---
Dropseed	SPORO	2- 5	---	---	---	---	---	---
Pine bluegrass	POSC	---	20-30	---	---	5-15	---	---
Needleandthread	STCO4	---	---	---	---	2-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-15	5-15	5-10	5-10	5-10	5-10	10-25
Annual grasses	AAGG	1- 5	---	1- 5	1- 5	---	2- 4	---
Perennial forbs	PPFF	4-10	5-10	5-10	5-10	5-10	2- 6	2- 5
Annual forbs	AAFF	1- 5	---	2- 5	2- 5	---	1- 5	2- 5
Shadscale	ATCO	10-25	---	2- 5	15-25	---	---	---
Bailey greasewood	SAVEB	5-10	---	5-10	5-15	---	2-10	---
Bud sagebrush	ARSP5	5-10	---	2- 5	2- 5	---	---	---
Winterfat	EULA5	5-10	---	---	---	---	---	---
Nevada ephedra	EPNE	1- 5	5-10	5-10	2- 5	5-10	2- 5	---
Wyoming big sagebrush	ARTRW	---	10-20	---	---	10-20	---	---
Spiny hopsage	GRSP	---	5-15	---	---	10-20	---	10-20
Spiny menodora	MESP2	---	---	10-25	---	---	---	---
Anderson wolfberry	LYAN	---	---	5-10	---	---	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	5-10	15-25	10-20	5-15	10-20	5-15

Range site number	029X017N	027X007N	029X037N	029X022N	027X008N	029X041N	027X029N
Potential production (lb/acre):							
Favorable years	350	600	300	300	700	500	800
Normal years	250	450	200	200	500	300	500
Unfavorable years	100	300	100	100	300	100	100

1511--Advokay sandy loam, moist, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Advokay	1	2	3	4
Indian ricegrass	ORHY	5-20	5-10	2- 5	5-10	---
Galleta	HIJA	5-10	10-25	10-20	---	---
Bottlebrush squirreltail	SIHY	---	2- 5	---	---	---
Needlegrass	STIPA	---	2- 5	5-10	---	---
Dropseed	SPORO	---	2- 5	---	---	---
Other perennial grasses	PPGG	5-10	5-15	5-10	5-10	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	---
Perennial forbs	PPFF	5-10	4-10	5-10	2- 6	---
Annual forbs	AAFF	2- 5	1- 5	2- 5	1- 5	---
Spiny menodora	MESP2	10-30	---	10-25	---	---
Bailey greasewood	SAVEB	5-15	5-10	5-10	2-10	---
Shadscale	ATCO	5-15	10-25	2- 5	---	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	---
Nevada ephedra	EPNE	5-10	1- 5	5-10	2- 5	---
Winterfat	EULA5	---	5-10	---	---	---
Anderson wolfberry	LYAN	---	---	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	---
Other shrubs	SSSS	10-20	10-20	15-25	10-20	---

Range site number	029X036N	029X017N	029X037N	029X041N	None
Potential production (lb/acre):					
Favorable years	400	350	300	500	---
Normal years	300	250	200	300	---
Unfavorable years	100	100	100	100	---

1530--Dakent-Crunker association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Dakent	Crunker	1	2	3
Galleta	HIJA	5-15	5-25	5-15	---	5-25
Indian ricegrass	ORHY	5-10	5-15	5-10	---	5-15
Needlegrass	STIPA	2-10	5-15	5-10	---	5-15
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 4	---	1- 5
Dropseed	SPORO	---	5-10	---	---	5-10
Sandberg bluegrass	POSE	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-20	5-20	5-20	10-25	5-20
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	3-10	4-10	2- 5	3-10
Annual forbs	AAFF	2- 5	2- 5	2- 7	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	20-30	---	15-20
Fourwing saltbush	ATCA2	5-10	---	---	---	---
Nevada ephedra	EPNE	2- 5	---	5-10	---	---
Winterfat	EULA5	2- 5	2-10	---	---	2-10
Spiny hopsage	GRSP	2- 5	5-10	---	10-20	5-10
Bud sagebrush	ARSP5	---	5-10	---	---	5-10
Big sagebrush	ARTR2	---	---	---	10-30	---
Rabbitbrush	CHRS9	---	---	---	10-30	---
Other shrubs	SSSS	10-25	10-20	10-20	5-15	10-20
Range site number		029X006N	029X049N	029X010N	027X029N	029X049N
Potential production (lb/acre):						
Favorable years		800	900	600	800	900
Normal years		500	600	400	500	600
Unfavorable years		300	300	200	100	300

1540--Beano-Annaw association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Beano	Annaw	1	2	3
Galleta	HIJA	10-25	10-25	---	5-25	10-25
Indian ricegrass	ORHY	5-10	5-10	5-10	5-15	5-10
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---	1- 5	2- 5
Needlegrass	STIPA	2- 5	2- 5	---	5-15	2- 5
Dropseed	SPORO	2- 5	2- 5	---	5-10	2- 5
Other perennial grasses	PPGG	5-15	5-15	5-10	5-20	5-15
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	4-10	4-10	2- 6	3-10	4-10
Annual forbs	AAFF	1- 5	1- 5	1- 5	2- 5	1- 5
Shadscale	ATCO	10-25	10-25	---	---	10-25
Bailey greasewood	SAVEB	5-10	5-10	2-10	---	5-10
Bud sagebrush	ARSP5	5-10	5-10	---	5-10	5-10
Winterfat	EULA5	5-10	5-10	---	2-10	5-10
Nevada ephedra	EPNE	1- 5	1- 5	2- 5	---	1- 5
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	---	15-20	---
Spiny hopsage	GRSP	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20

Range site number	029X017N	029X017N	029X041N	029X049N	029X017N
Potential production (lb/acre):					
Favorable years	350	350	500	900	350
Normal years	250	250	300	600	250
Unfavorable years	100	100	100	300	100

1551--Typic Torriorthents-Unsel association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Typic Torriorthents	Unsel	1	2	3
Indian ricegrass	ORHY	2- 5	5-10	5-10	5-10	2- 5
King desertgrass	BLKI	1- 2	---	---	---	1- 2
Bottlebrush squirreltail	SIHY	1- 2	2- 5	2- 5	---	1- 2
Galleta	HIJA	---	10-25	10-25	---	---
Needlegrass	STIPA	---	2- 5	2- 5	---	---
Dropseed	SPORO	---	2- 5	2- 5	---	---
Other perennial grasses	PPGG	1- 5	5-15	5-15	5-10	1- 5
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	1- 5
Perennial forbs	PPFF	2- 5	4-10	4-10	2- 6	2- 5
Annual forbs	AAFF	1- 5	1- 5	1- 5	1- 5	1- 5
Shadscale	ATCO	40-60	10-25	10-25	---	40-60
Bailey greasewood	SAVEB	10-15	5-10	5-10	2-10	10-15
Nevada dalea	DAPO2	5-10	---	---	---	5-10
Cooper wolfberry	LYCO2	2- 5	---	---	2- 5	2- 5
Bud sagebrush	ARSP5	2- 5	5-10	5-10	---	2- 5
Winterfat	EULA5	---	5-10	5-10	---	---
Nevada ephedra	EPNE	---	1- 5	1- 5	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---
Other shrubs	SSSS	5-15	10-20	10-20	10-20	5-15

Range site number	029X033N	029X017N	029X017N	029X041N	029X033N
Potential production (lb/acre):					
Favorable years	100	350	350	500	100
Normal years	50	250	250	300	50
Unfavorable years	25	100	100	100	25

1570--Budihol-Uripnes-Petspring association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Budihol	Uripnes	Petspring	1	2	3
Pine bluegrass	POSC	20-30	---	---	---	5-15	X
Needlegrass	STIPA	5-15	---	---	---	---	---
Desert needlegrass	STSP3	---	20-30	20-40	---	---	---
Galleta	HIJA	---	5-10	5-15	---	---	---
Indian ricegrass	ORHY	---	2- 5	5-10	---	5-15	---
Bottlebrush squirreltail	SIHY	---	---	---	---	5-10	X
Needleandthread	STCO4	---	---	---	---	2-10	---
Other perennial grasses	PPGG	5-15	2- 5	5-10	---	5-10	X
Perennial forbs	PPFF	5-10	2- 5	2- 5	---	5-10	X
Wyoming big sagebrush	ARTRW	10-20	---	15-25	---	10-20	X
Spiny hopsage	GRSP	5-15	---	5-15	---	10-20	---
Nevada ephedra	EPNE	5-10	5-10	5-15	---	5-10	---
Anderson wolfberry	LYAN	---	10-20	---	---	---	---
Littleleaf horsebrush	TEGL	---	10-15	---	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---	---
Shadscale	ATCO	---	2- 5	---	---	---	---
Mountain big sagebrush	ARTRV	---	---	---	---	---	X
Green ephedra	EPVI	---	---	---	---	---	X
Other shrubs	SSSS	5-10	5-10	5-10	---	5-15	X
Singleleaf pinyon	PIMO	---	---	---	---	---	X
Utah juniper	JUOS	---	---	---	---	---	X

Range site number	027X007N	027X047N	027X065N	None	027X008N	026X062N
Potential production (lb/acre):						
Favorable years	600	400	500	700	250	---
Normal years	450	200	300	500	200	---
Unfavorable years	300	100	200	300	150	---

## 1580--Rockabin-Hiridge association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Rockabin	Hiridge	1	2	3
Letterman needlegrass	STLE4	10-25	10-25	---	---	---
Bluegrass	POA++	5-10	5-10	---	---	---
Prairie junegrass	KOCR	2- 5	2- 5	---	---	---
Pine bluegrass	POSC	---	---	5-10	---	---
Basin wildrye	ELCI2	---	---	2- 5	5-15	---
Western needlegrass	STOC2	---	---	---	20-40	---
Mountain brome	BRMA4	---	---	---	5-10	---
Other perennial grasses	PPGG	10-15	10-15	2-10	5-15	---
Arrowleaf balsamroot	BASA3	---	---	2- 5	---	---
Other perennial forbs	PPFF	5-15	5-15	2-10	10-20	---
Annual forbs	AAFF	---	---	---	5-10	---
Low sagebrush	ARAR8	20-30	20-30	---	---	---
Curleaf mountainmahogany	CELE3	---	---	45-65	---	---
Mountain big sagebrush	ARTRV	---	---	2- 5	10-20	---
Snowberry	SYMPH	---	---	2- 5	---	---
Eriogonum	ERIOG	---	---	---	5-10	---
Other shrubs	SSSS	5-15	5-15	2-10	5-10	---
Range site number		026X028N	026X028N	026X009N	026X038N	None
Potential production (lb/acre):						
Favorable years		350	350	1,000	1,500	---
Normal years		250	250	800	900	---
Unfavorable years		150	150	600	600	---

1590--Snopoc-Rockabin-Fusuvar association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Snopoc	Rockabin	Fusuvar	1	2
Western needlegrass	STOC2	20-40	---	---	---	---
Basin wildrye	ELCI2	5-15	---	2- 5	---	---
Mountain brome	BRMA4	5-10	---	---	---	---
Letterman needlegrass	STLE4	---	10-25	---	10-25	---
Bluegrass	POA++	---	5-10	---	5-10	---
Prairie junegrass	KOCR	---	2- 5	---	2- 5	---
Pine bluegrass	POSC	---	---	5-10	---	---
Other perennial grasses	PPGG	5-15	10-15	2-10	10-15	---
Arrowleaf balsamroot	BASA3	---	---	2- 5	---	---
Other perennial forbs	PPFF	10-20	5-15	2-10	5-15	---
Annual forbs	AAFF	5-10	---	---	---	---
Mountain big sagebrush	ARTRV	10-20	---	2- 5	---	---
Eriogonum	ERIOG	5-10	---	---	---	---
Low sagebrush	ARAR8	---	20-30	---	20-30	---
Curleaf mountainmahogany	CELE3	---	---	45-65	---	---
Snowberry	SYMPH	---	---	2- 5	---	---
Other shrubs	SSSS	5-10	5-15	2-10	5-15	---

Range site number	026X038N	026X028N	026X009N	026X028N	None
Potential production (lb/acre):					
Favorable years	1,500	350	1,000	350	---
Normal years	900	250	800	250	---
Unfavorable years	600	150	600	150	---

## 1591--Snopoc-Rockabin-Hiridge association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Snopoc	Rockabin	Hiridge	1	2
Western needlegrass	STOC2	20-40	---	---	---	---
Basin wildrye	ELCI2	5-15	---	---	2- 5	---
Mountain brome	BRMA4	5-10	---	---	---	---
Letterman needlegrass	STLE4	---	10-25	10-25	---	---
Bluegrass	POA++	---	5-10	5-10	---	---
Prairie junegrass	KOCR	---	2- 5	2- 5	---	---
Pine bluegrass	POSC	---	---	---	5-10	---
Other perennial grasses	PPGG	5-15	10-15	10-15	2-10	---
Arrowleaf balsamroot	BASA3	---	---	---	2- 5	---
Other perennial forbs	PPFF	10-20	5-15	5-15	2-10	---
Annual forbs	AAFF	5-10	---	---	---	---
Mountain big sagebrush	ARTRV	10-20	---	---	2- 5	---
Eriogonum	ERIOG	5-10	---	---	---	---
Low sagebrush	ARAR8	---	20-30	20-30	---	---
Curleaf mountainmahogany	CELE3	---	---	---	45-65	---
Snowberry	SYMPH	---	---	---	2- 5	---
Other shrubs	SSSS	5-10	5-15	5-15	2-10	---
Range site number		026X038N	026X028N	026X028N	026X009N	None
Potential production (lb/acre):						
Favorable years		1,500	350	350	1,000	---
Normal years		900	250	250	800	---
Unfavorable years		600	150	150	600	---

1600--Nupart-Lazan-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Nupart	Lazan	Rock outcrop	1	2
Western needlegrass	STOC2	X	---	---	20-40	X
Pine bluegrass	POSC	X	---	---	---	X
Indian ricegrass	ORHY	X	X	---	---	X
Bottlebrush squirreltail	SIHY	X	---	---	---	X
Desert needlegrass	STSP3	---	X	---	---	---
Basin wildrye	ELCI2	---	---	---	5-15	---
Mountain brome	BRMA4	---	---	---	5-10	---
Other perennial grasses	PPGG	X	X	---	5-15	X
Perennial forbs	PPFF	X	X	---	10-20	X
Annual forbs	AAFF	---	---	---	5-10	---
Mountain big sagebrush	ARTRV	X	---	---	10-20	X
Antelope bitterbrush	PUTR2	X	X	---	---	X
Green ephedra	EPVI	X	---	---	---	X
Wyoming big sagebrush	ARTRW	---	X	---	---	---
Douglas rabbitbrush	CHVI8	---	X	---	---	---
Eriogonum	ERIOG	---	---	---	5-10	---
Other shrubs	SSSS	X	X	---	5-10	X
Singleleaf pinyon	PIMO	X	X	---	---	X
Utah juniper	JUOS	X	X	---	---	X

Range site number	026X060N	026X061N	None	026X038N	026X060N
Potential production (lb/acre):					
Favorable years	300	225	---	1,500	300
Normal years	225	200	---	900	225
Unfavorable years	150	150	---	600	150

1601--Nupart-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Nupart	Rock outcrop	1	2	3
Western needlegrass	STOC2	X	---	---	---	---
Pine bluegrass	POSC	X	---	---	---	20-30
Indian ricegrass	ORHY	X	---	5-10	X	---
Bottlebrush squirreltail	SIHY	X	---	---	---	---
Desert needlegrass	STSP3	---	---	20-40	X	---
Galleta	HIJA	---	---	5-15	---	---
Needlegrass	STIPA	---	---	---	---	5-15
Other perennial grasses	PPGG	X	---	5-10	X	5-15
Perennial forbs	PPFF	X	---	2- 5	X	5-10
Mountain big sagebrush	ARTRV	X	---	---	---	---
Antelope bitterbrush	PUTR2	X	---	---	X	---
Green ephedra	EPVI	X	---	---	---	---
Wyoming big sagebrush	ARTRW	---	---	15-25	X	10-20
Nevada ephedra	EPNE	---	---	5-15	---	5-10
Spiny hopsage	GRSP	---	---	5-15	---	5-15
Douglas rabbitbrush	CHVI8	---	---	---	X	---
Other shrubs	SSSS	X	---	5-10	X	5-10
Singleleaf pinyon	PIMO	X	---	---	X	---
Utah juniper	JUOS	X	---	---	X	---
Range site number		026X060N	None	027X065N	026X061N	027X007N
Potential production (lb/acre):						
Favorable years		300	---	500	225	600
Normal years		225	---	300	200	450
Unfavorable years		150	---	200	150	300

1632--Annaw-Wardenot-Pintwater association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Annaw	Wardenot	Pintwater	1	2	3
Galleta	HIJA	10-25	10-25	10-20	5-10	---	10-20
Indian ricegrass	ORHY	5-10	5-10	2- 5	5-20	5-10	2- 5
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---	---	---	---
Needlegrass	STIPA	2- 5	2- 5	5-10	---	---	5-10
Dropseed	SPORO	2- 5	2- 5	---	---	---	---
Other perennial grasses	PPGG	5-15	5-15	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	2- 4	1- 5
Perennial forbs	PPFF	4-10	4-10	5-10	5-10	2- 6	5-10
Annual forbs	AAFF	1- 5	1- 5	2- 5	2- 5	1- 5	2- 5
Shadscale	ATCO	10-25	10-25	2- 5	5-15	---	2- 5
Bailey greasewood	SAVEB	5-10	5-10	5-10	5-15	2-10	5-10
Bud sagebrush	ARSP5	5-10	5-10	2- 5	5-10	---	2- 5
Winterfat	EULA5	5-10	5-10	---	---	---	---
Nevada ephedra	EPNE	1- 5	1- 5	5-10	5-10	2- 5	5-10
Spiny menodora	MESP2	---	---	10-25	10-30	---	10-25
Anderson wolfberry	LYAN	---	---	5-10	---	---	5-10
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---
Other shrubs	SSSS	10-20	10-20	15-25	10-20	10-20	15-25

Range site number	029X017N	029X017N	029X037N	029X036N	029X041N	029X037N
Potential production (lb/acre):						
Favorable years	350	350	300	400	500	300
Normal years	250	250	200	300	300	200
Unfavorable years	100	100	100	100	100	100

1641--Unsel-Annaw association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Unsel	Annaw	1	2	3	4
Galleta	HIJA	10-25	10-25	---	---	5-20	5-15
Indian ricegrass	ORHY	5-10	5-10	5-10	2- 5	5-15	5-10
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---	1- 2	2- 5	1- 5
Needlegrass	STIPA	2- 5	2- 5	---	---	5-10	2-10
Dropseed	SPORO	2- 5	2- 5	---	---	---	---
King desertgrass	BLKI	---	---	---	1- 2	---	---
Other perennial grasses	PPGG	5-15	5-15	5-10	1- 5	5-10	10-20
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5	1- 5
Perennial forbs	PPFF	4-10	4-10	2- 6	2- 5	5-10	5-10
Annual forbs	AAFF	1- 5	1- 5	1- 5	1- 5	2- 5	2- 5
Shadscale	ATCO	10-25	10-25	---	40-60	15-25	---
Bailey greasewood	SAVEB	5-10	5-10	2-10	10-15	5-15	---
Bud sagebrush	ARSP5	5-10	5-10	---	2- 5	2- 5	---
Winterfat	EULA5	5-10	5-10	---	---	---	2- 5
Nevada ephedra	EPNE	1- 5	1- 5	2- 5	---	2- 5	2- 5
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	5-10
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	2- 5	---	---
Nevada dalea	DAPO2	---	---	---	5-10	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	15-20
Spiny hopsage	GRSP	---	---	---	---	---	2- 5
Other shrubs	SSSS	10-20	10-20	10-20	5-15	10-20	10-25
Range site number		029X017N	029X017N	029X041N	029X033N	029X022N	029X006N
Potential production (lb/acre):							
Favorable years		350	350	500	100	300	800
Normal years		250	250	300	50	200	500
Unfavorable years		100	100	100	25	100	300

1643--Unsel-Annaw-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Unsel	Annaw	Izo	1	2
Galleta	HIJA	10-25	10-25	---	10-25	5-20
Indian ricegrass	ORHY	5-10	5-10	5-10	5-10	5-15
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---	2- 5	2- 5
Needlegrass	STIPA	2- 5	2- 5	---	2- 5	5-10
Dropseed	SPORO	2- 5	2- 5	---	2- 5	---
Other perennial grasses	PPGG	5-15	5-15	5-10	5-15	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	4-10	4-10	2- 6	4-10	5-10
Annual forbs	AAFF	1- 5	1- 5	1- 5	1- 5	2- 5
Shadscale	ATCO	10-25	10-25	---	10-25	15-25
Bailey greasewood	SAVEB	5-10	5-10	2-10	5-10	5-15
Bud sagebrush	ARSP5	5-10	5-10	---	5-10	2- 5
Winterfat	EULA5	5-10	5-10	---	5-10	---
Nevada ephedra	EPNE	1- 5	1- 5	2- 5	1- 5	2- 5
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20
Range site number		029X017N	029X017N	029X041N	029X017N	029X022N
Potential production (lb/acre):						
Favorable years		350	350	500	350	300
Normal years		250	250	300	250	200
Unfavorable years		100	100	100	100	100

1670--Bouncer gravelly loamy fine sand, 15 to 50 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Bouncer	1	2	3	4
Pine bluegrass	POSC	X	X	---	X	---
Bottlebrush squirreltail	SIHY	X	X	---	X	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	X	---	X	10-25
Perennial forbs	PPFF	X	X	---	X	2- 5
Annual forbs	AAFF	---	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	X	X	---	X	---
Mountain big sagebrush	ARTRV	X	X	---	X	---
Green ephedra	EPVI	X	X	---	X	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	10-20
Other shrubs	SSSS	X	X	---	X	5-15
Singleleaf pinyon	PIMO	X	X	---	X	---
Utah juniper	JUOS	X	X	---	X	---

Range site number	026X062N	026X062N	None	026X062N	027X029N
Potential production (lb/acre):					
Favorable years	250	250	---	250	800
Normal years	200	200	---	200	500
Unfavorable years	150	150	---	150	100

1680--Lazan-Lazan, very steep-Nupart association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Lazan	Lazan, very steep	Nupart	1	2	3	4
Desert needlegrass	STSP	X	X	---	20-40	---	---	---
Indian ricegrass	ORHY	X	X	X	5-10	---	---	---
Western needlegrass	STOC2	---	---	X	---	---	---	---
Pine bluegrass	POSC	---	---	X	---	---	X	---
Bottlebrush squirreltail	SIHY	---	---	X	---	---	X	---
Galleta	HIJA	---	---	---	5-15	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	X	X	5-10	---	X	10-25
Perennial forbs	PPFF	X	X	X	2- 5	---	X	2- 5
Annual forbs	AAFF	---	---	---	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	X	X	---	15-25	---	X	---
Antelope bitterbrush	PUTR2	X	X	X	---	---	---	---
Douglas rabbitbrush	CHVI8	X	X	---	---	---	---	---
Mountain big sagebrush	ARTRV	---	---	X	---	---	X	---
Green ephedra	EPVI	---	---	X	---	---	X	---
Nevada ephedra	EPNE	---	---	---	5-15	---	---	---
Spiny hopsage	GRSP	---	---	---	5-15	---	---	10-20
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	X	X	X	5-10	---	X	5-15
Singleleaf pinyon	PIMO	X	X	X	---	---	X	---
Utah juniper	JUOS	X	X	X	---	---	X	---

Range site number	026X061N	026X061N	026X060N	027X065N	None	026X062N	027X029N
Potential production (lb/acre):							
Favorable years	225	225	300	500	---	250	800
Normal years	200	200	225	300	---	200	500
Unfavorable years	150	150	150	200	---	150	100

1691--Crunkvar-Lazan association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Crunkvar	Lazan	1	2	3	4
Galleta	HIJA	5-25	---	---	---	---	---
Indian ricegrass	ORHY	5-15	X	15-20	15-20	---	5-15
Needlegrass	STIPA	5-15	---	5-15	5-15	---	---
Dropseed	SPORO	5-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	5-10	5-10	---	5-10
Desert needlegrass	STSP3	---	X	---	---	---	---
Needleandthread	STCO4	---	---	15-20	15-20	---	2-10
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---
Pine bluegrass	POSC	---	---	---	---	---	5-15
Other perennial grasses	PPGG	5-20	X	---	---	10-25	5-10
Annual grasses	AAGG	1- 5	---	---	---	---	---
Perennial forbs	PPFF	3-10	X	5-10	5-10	2- 5	5-10
Annual forbs	AAFF	2- 5	---	2- 5	2- 5	2- 5	---
Wyoming big sagebrush	ARTRW	15-20	X	---	---	---	10-20
Spiny hopsage	GRSP	5-10	---	2- 5	2- 5	10-20	10-20
Bud sagebrush	ARSP5	5-10	---	---	---	---	---
Winterfat	EULA5	2-10	---	---	---	---	---
Antelope bitterbrush	PUTR2	---	X	---	---	---	---
Douglas rabbitbrush	CHVI8	---	X	---	---	---	---
Basin big sagebrush	ARTRT	---	---	5-10	5-10	---	---
Anderson peachbrush	PRAN2	---	---	2- 5	2- 5	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	---	---	10-30	---
Nevada ephedra	EPNE	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	X	5-15	5-15	5-15	5-15
Singleleaf pinyon	PIMO	---	X	---	---	---	---
Utah juniper	JUOS	---	X	---	---	---	---
Range site number		029X049N	026X061N	026X020N	026X020N	027X029N	027X008N
Potential production (lb/acre):							
Favorable years		900	225	800	800	800	700
Normal years		600	200	600	600	500	500
Unfavorable years		300	150	400	400	100	300

1700--Granmount-Kiote-Hiridge association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Granmount	Kiote	Hiridge	1	2
Letterman needlegrass	STLE4	10-25	---	10-25	10-25	---
Bluegrass	POA++	5-10	---	5-10	5-10	---
Prairie junegrass	KOCR	2- 5	---	2- 5	2- 5	---
Western needlegrass	STOC2	---	20-40	---	---	---
Basin wildrye	ELCI2	---	5-15	---	---	---
Mountain brome	BRMA4	---	5-10	---	---	---
Other perennial grasses	PPGG	10-15	5-15	10-15	10-15	---
Perennial forbs	PPFF	5-15	10-20	5-15	5-15	---
Annual forbs	A AFF	---	5-10	---	---	---
Low sagebrush	ARAR8	20-30	---	20-30	20-30	---
Mountain big sagebrush	ARTRV	---	10-20	---	---	---
Eriogonum	ERIOG	---	5-10	---	---	---
Other shrubs	SSSS	5-15	5-10	5-15	5-15	---
Range site number		026X028N	026X038N	026X028N	026X028N	None
Potential production (lb/acre):						
Favorable years		350	1,500	350	350	---
Normal years		250	900	250	250	---
Unfavorable years		150	600	150	150	---

## 1710--Troutville Variant very bouldery sandy loam, 30 to 75 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Troutville Variant	1	2	3
Western needlegrass	STOC2	---	20-40	---	---
Basin wildrye	ELCI2	---	5-15	2- 5	---
Mountain brome	BRMA4	---	5-10	---	---
Pine bluegrass	POSC	---	---	5-10	---
Other perennial grasses	PPGG	---	5-15	2-10	---
Arrowleaf balsamroot	BASA3	---	---	2- 5	---
Other perennial forbs	PPFF	---	10-20	2-10	---
Annual forbs	AAFF	---	5-10	---	---
Mountain big sagebrush	ARTRV	---	10-20	2- 5	---
Eriogonum	ERIOG	---	5-10	---	---
Curleaf mountainmahogany	CELE3	---	---	45-65	---
Snowberry	SYMPH	---	---	2- 5	---
Other shrubs	SSSS	---	5-10	2-10	---
Range site number		None	026X038N	026X009N	None
Potential production (lb/acre):					
Favorable years		---	1,500	1,000	---
Normal years		---	900	800	---
Unfavorable years		---	600	600	---

1730--Bijorja-Petspring association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Bijorja	Petspring	1	2	3	4
Desert needlegrass	STSP3	20-40	20-40	20-40	---	---	---
Galleta	HIJA	5-15	5-15	5-15	---	---	---
Indian ricegrass	ORHY	5-10	5-10	5-10	---	---	---
Pine bluegrass	POSC	---	---	---	---	20-30	---
Needlegrass	STIPA	---	---	---	---	5-15	---
Other perennial grasses	PPGG	5-10	5-10	5-10	---	5-15	---
Perennial forbs	PPFF	2- 5	2- 5	2- 5	---	5-10	---
Wyoming big sagebrush	ARTRW	15-25	15-25	15-25	---	10-20	---
Nevada ephedra	EPNE	5-15	5-15	5-15	---	5-10	---
Spiny hopsage	GRSP	5-15	5-15	5-15	---	5-15	---
Anderson wolfberry	LYAN	---	---	---	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	---
Burrobrush	HYMEN3	---	---	---	---	---	---
Shadscale	ATCO	---	---	---	---	---	---
Other shrubs	SSSS	5-10	5-10	5-10	---	5-10	---
Range site number		027X065N	027X065N	027X007N	None	027X047N	None
Potential production (lb/acre):							
Favorable years		500	500	600	---	400	---
Normal years		300	300	450	---	200	---
Unfavorable years		200	200	300	---	100	---

1750--Wedlar-Tert association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Wedlar	Tert	1	2	3
Galleta	HIJA	5-15	2- 5	10-25	---	5-15
Indian ricegrass	ORHY	5-10	2- 5	5-10	---	5-10
Needlegrass	STIPA	2-10	---	2- 5	---	2-10
Bottlebrush squirreltail	SIHY	1- 5	2- 5	2- 5	---	1- 5
Dropseed	SPORO	---	---	2- 5	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-20	2- 5	5-15	10-25	10-20
Annual grasses	AAGG	1- 5	---	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	2- 8	4-10	2- 5	5-10
Annual forbs	AAFF	2- 5	1- 2	1- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	---	---	---	15-20
Fourwing saltbush	ATCA2	5-10	---	---	---	5-10
Nevada ephedra	EPNE	2- 5	5-15	1- 5	---	2- 5
Winterfat	EULA5	2- 5	---	5-10	---	2- 5
Spiny hopsage	GRSP	2- 5	---	---	10-20	2- 5
Black sagebrush	ARARN	---	5-15	---	---	---
Mexican cliffrose	COME5	---	2-10	---	---	---
Shadscale	ATCO	---	2-10	10-25	---	---
Bailey greasewood	SAVEB	---	---	5-10	---	---
Bud sagebrush	ARSP5	---	---	5-10	---	---
Big sagebrush	ARTR2	---	---	---	10-30	---
Rabbitbrush	CHRY59	---	---	---	10-30	---
Other shrubs	SSSS	10-25	5-15	10-20	5-15	10-25
Utah juniper	JUOS	---	2- 5	---	---	---
Range site number		029X006N	027X066N	029X017N	027X029N	029X006N
Potential production (lb/acre):						
Favorable years		800	100	350	800	800
Normal years		500	75	250	500	500
Unfavorable years		300	50	100	100	300

1753--Wedlar sand, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Wedlar	1	2
Wheatgrass	AGROP2	2- 5	---	---
Indian ricegrass	ORHY	10-20	5-10	15-20
Needleandthread	STCO4	10-30	5-10	15-20
Bottlebrush squirreltail	SIHY	2- 5	---	5-10
Galleta	HIJA	---	15-25	---
Needlegrass	STIPA	---	---	5-15
Other perennial grasses	PPGG	5-10	2-10	---
Perennial forbs	PPFF	2- 5	5-10	5-10
Annual forbs	AAFF	2- 5	---	2- 5
Big sagebrush	ARTR2	10-20	---	---
Spiny hopsage	GRSP	5-10	---	2- 5
Low sagebrush	ARAR8	---	20-30	---
Nevada ephedra	EPNE	---	2- 5	---
Basin big sagebrush	ARTRT	---	---	5-10
Anderson peachbrush	PRAN2	---	---	2- 5
Other shrubs	SSSS	5-10	5-15	5-15

Range site number	027X045N	027X049N	026X020N
Potential production (lb/acre):			
Favorable years	700	500	800
Normal years	500	350	600
Unfavorable years	400	200	400

1780--Borealis-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Borealis	Rock outcrop	1	2	3
Western needlegrass	STOC2	X	---	---	---	---
Pine bluegrass	POSC	X	---	---	---	---
Indian ricegrass	ORHY	X	---	15-20	---	5-10
Bottlebrush squirreltail	SIHY	X	---	5-10	---	1- 4
Needleandthread	STCO4	---	---	15-20	---	---
Needlegrass	STIPA	---	---	5-15	---	5-10
Galleta	HIJA	---	---	---	---	5-15
Other perennial grasses	PPGG	X	---	---	---	5-20
Annual grasses	AAGG	---	---	---	---	1- 5
Perennial forbs	PPFF	X	---	5-10	---	4-10
Annual forbs	AAFF	---	---	2- 5	---	2- 7
Mountain big sagebrush	ARTRV	X	---	---	---	---
Antelope bitterbrush	PUTR2	X	---	---	---	---
Green ephedra	EPVI	X	---	---	---	---
Basin big sagebrush	ARTRT	---	---	5-10	---	---
Spiny hopsage	GRSP	---	---	2- 5	---	---
Anderson peachbrush	PRAN2	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	20-30
Nevada ephedra	EPNE	---	---	---	---	5-10
Other shrubs	SSSS	X	---	5-15	---	10-20
Singleleaf pinyon	PIMO	X	---	---	---	---
Utah juniper	JUOS	X	---	---	---	---
Range site number		026X060N	None	026X020N	None	029X010N
Potential production (lb/acre):						
Favorable years		300	---	800	---	600
Normal years		225	---	600	---	400
Unfavorable years		150	---	400	---	200

1781--Borealis-Antholop-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Borealis	Antholop	Rock outcrop	1	2
Western needlegrass	STOC2	X	---	---	---	X
Pine bluegrass	POSC	X	---	---	---	X
Indian ricegrass	ORHY	X	5-10	---	15-20	X
Bottlebrush squirreltail	SIHY	X	---	---	5-10	X
Galleta	HIJA	---	15-25	---	---	---
Needleandthread	STCO4	---	5-10	---	15-20	---
Needlegrass	STIPA	---	---	---	5-15	---
Other perennial grasses	PPGG	X	2-10	---	---	X
Perennial forbs	PPFF	X	5-10	---	5-10	X
Annual forbs	AAFF	---	---	---	2- 5	---
Mountain big sagebrush	ARTRV	X	---	---	---	X
Antelope bitterbrush	PUTR2	X	---	---	---	X
Green ephedra	EPVI	X	---	---	---	X
Low sagebrush	ARAR8	---	20-30	---	---	---
Nevada ephedra	EPNE	---	2- 5	---	---	---
Basin big sagebrush	ARTRT	---	---	---	5-10	---
Spiny hopsage	GRSP	---	---	---	2- 5	---
Anderson peachbrush	PRAN2	---	---	---	2- 5	---
Other shrubs	SSSS	X	5-15	---	5-15	X
Singleleaf pinyon	PIMO	X	---	---	---	X
Utah juniper	JUOS	X	---	---	---	X

Range site number	026X060N	027X049N	None	026X020N	026X060N
Potential production (lb/acre):					
Favorable years	300	500	---	800	300
Normal years	225	350	---	600	225
Unfavorable years	150	200	---	400	150

## 1782--Borealis-Mopana association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Borealis	Mopana	1	2
Western needlegrass	STOC2	X	---	---	---
Pine bluegrass	POSC	X	---	---	---
Indian ricegrass	ORHY	X	---	---	---
Bottlebrush squirreltail	SIHY	X	---	X	---
Letterman needlegrass	STLE4	---	10-25	---	---
Bluegrass	POA++	---	5-10	---	---
Prairie junegrass	KOCR	---	2- 5	---	---
Thurber needlegrass	STH2	---	---	X	---
Ricegrass	ORYZO	---	---	X	---
Other perennial grasses	PPGG	X	10-15	X	---
Perennial forbs	PPFF	X	5-15	X	---
Mountain big sagebrush	ARTRV	X	---	---	---
Antelope bitterbrush	PUTR2	X	---	X	---
Green ephedra	EPVI	X	---	X	---
Low sagebrush	ARAR8	---	20-30	X	---
Other shrubs	SSSS	X	5-15	X	---
Singleleaf pinyon	PIMO	X	---	X	---
Utah juniper	JUOS	X	---	X	---
Range site number		026X060N	026X028N	026X064N	None
Potential production (lb/acre):					
Favorable years		300	350	325	---
Normal years		225	250	225	---
Unfavorable years		150	150	150	---

1783--Borealis-Itca association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Borealis	Itca	1	2	3
Western needlegrass	STOC2	X	X	---	---	20-35
Pine bluegrass	POSC	X	X	---	---	---
Indian ricegrass	ORHY	X	X	---	---	---
Bottlebrush squirreltail	SIHY	X	X	X	---	---
Thurber needlegrass	STTH2	---	---	X	---	---
Ricegrass	ORYZO	---	---	X	---	---
Mountain brome	BRMA4	---	---	---	---	10-20
Basin wildrye	ELCI2	---	---	---	---	10-20
Bluegrass	POA++	---	---	---	---	5-10
Other perennial grasses	PPGG	X	X	X	---	5-15
Perennial forbs	PPFF	X	X	X	---	5-15
Annual forbs	AAFF	---	---	---	---	2- 5
Mountain big sagebrush	ARTRV	X	X	---	---	5-10
Antelope bitterbrush	PUTR2	X	X	X	---	5-15
Green ephedra	EPVI	X	X	X	---	---
Low sagebrush	ARAR8	---	---	X	---	---
Other shrubs	SSSS	X	X	X	---	5-15
Singleleaf pinyon	PIMO	X	X	X	---	---
Utah juniper	JUOS	X	X	X	---	---
Range site number		026X060N	026X060N	026X064N	None	026X005N
Potential production (lb/acre):						
Favorable years		300	300	325	---	1,500
Normal years		225	225	225	---	1,100
Unfavorable years		150	150	150	---	800

1790--Antholop-Wedlar association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Antholop	Wedlar	1	2
Galleta	HIJA	15-25	---	---	---
Indian ricegrass	ORHY	5-10	10-20	X	---
Needleandthread	STCO4	5-10	10-30	---	---
Wheatgrass	AGROP2	---	2- 5	---	---
Bottlebrush squirreltail	SIHY	---	2- 5	X	---
Western needlegrass	STOC2	---	---	X	---
Pine bluegrass	POSC	---	---	X	---
Other perennial grasses	PPGG	2-10	5-10	X	---
Perennial forbs	PPFF	5-10	2- 5	X	---
Annual forbs	AAFF	---	2- 5	---	---
Low sagebrush	ARAR8	20-30	---	---	---
Nevada ephedra	EPNE	2- 5	---	---	---
Big sagebrush	ARTR2	---	10-20	---	---
Spiny hopsage	GRSP	---	5-10	---	---
Mountain big sagebrush	ARTRV	---	---	X	---
Antelope bitterbrush	PUTR2	---	---	X	---
Green ephedra	EPVI	---	---	X	---
Other shrubs	SSSS	5-15	5-10	X	---
Singleleaf pinyon	PIMO	---	---	X	---
Utah juniper	JUOS	---	---	X	---
Range site number		027X049N	027X045N	026X060N	None
Potential production (lb/acre):					
Favorable years		500	700	300	---
Normal years		350	500	225	---
Unfavorable years		200	400	150	---

1820--Lomoin-Petspring-Uripnes association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Lomoin	Petspring	Uripnes	1	2	3	4
Galleta	HIJA	5-15	5-15	5-10	---	---	---	5-25
Indian ricegrass	ORHY	5-10	5-10	2- 5	---	---	5-10	5-15
Needlegrass	STIPA	2-10	---	---	---	5-15	---	5-15
Bluegrass	POA++	2-10	---	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	---	---	---	1- 5
Desert needlegrass	STSP3	---	20-40	20-30	---	---	---	---
Pine bluegrass	POSC	---	---	---	---	20-30	---	---
Dropseed	SPORO	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-15	5-10	2- 5	---	5-15	5-10	5-20
Annual grasses	AAGG	1- 5	---	---	---	---	2- 4	1- 5
Perennial forbs	PPFF	5-10	2- 5	2- 5	---	5-10	2- 6	3-10
Annual forbs	AAFF	1- 5	---	---	---	---	1- 5	2- 5
Black sagebrush	ARARN	15-20	---	---	---	---	---	---
Nevada ephedra	EPNE	5-10	5-15	5-10	---	5-10	2- 5	---
Bud sagebrush	ARSP5	2- 5	---	---	---	---	---	5-10
Winterfat	EULA5	2- 5	---	---	---	---	---	2-10
Wyoming big sagebrush	ARTRW	---	15-25	---	---	10-20	---	15-20
Spiny hopsage	GRSP	---	5-15	---	---	5-15	---	5-10
Anderson wolfberry	LYAN	---	---	10-20	---	---	---	---
Littleleaf horsebrush	TEGL	---	---	10-15	---	---	5-10	---
Burrobrush	HYMEN3	---	---	5-10	---	---	5-10	---
Shadscale	ATCO	---	---	2- 5	---	---	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-15	---
Bailey greasewood	SAVEB	---	---	---	---	---	2-10	---
Cooper wolfberry	LYCO2	---	---	---	---	---	2- 5	---
Other shrubs	SSSS	10-20	5-10	5-10	---	5-10	10-20	10-20

Range site number	029X014N	027X065N	027X047N	None	027X007N	029X041N	029X049N
Potential production (lb/acre):							
Favorable years	500	500	400	---	600	500	900
Normal years	300	300	200	---	450	300	600
Unfavorable years	100	200	100	---	300	100	300

1821--Lomoin-Kyler-Budihol association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Lomoin	Kyler	Budihol	1	2	3	4
Galleta	HIJA	5-15	5-15	---	5-15	---	5-25	---
Indian ricegrass	ORHY	5-10	5-10	---	5-10	---	5-15	---
Needlegrass	STIPA	2-10	2-10	5-15	---	---	5-15	---
Bluegrass	POA++	2-10	2-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	---	---	---	1- 5	---
Pine bluegrass	POSC	---	---	20-30	---	---	---	---
Desert needlegrass	STSP3	---	---	---	20-40	---	---	---
Dropseed	SPORO	---	---	---	---	---	5-10	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	10-15	5-15	5-10	---	5-20	10-25
Annual grasses	AAGG	1- 5	1- 5	---	---	---	1- 5	---
Perennial forbs	PPFF	5-10	5-10	5-10	2- 5	---	3-10	2- 5
Annual forbs	AAFF	1- 5	1- 5	---	---	---	2- 5	2- 5
Black sagebrush	ARARN	15-20	15-20	---	---	---	---	---
Nevada ephedra	EPNE	5-10	5-10	5-10	5-15	---	---	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	---	5-10	---
Winterfat	EULA5	2- 5	2- 5	---	---	---	2-10	---
Wyoming big sagebrush	ARTRW	---	---	10-20	15-25	---	15-20	---
Spiny hopsage	GRSP	---	---	5-15	5-15	---	5-10	10-20
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	10-20	5-10	5-10	---	10-20	5-15
Range site number		029X014N	029X014N	027X007N	027X065N	None	029X049N	027X029N
Potential production (lb/acre):								
Favorable years		500	500	600	500	---	900	800
Normal years		300	300	450	300	---	600	500
Unfavorable years		100	100	300	200	---	300	100

1822--Lomoine-Kyler-Petspring association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Lomoine	Kyler	Petspring	1	2	3	4
Galleta	HIJA	5-15	---	5-15	---	5-15	---	---
Indian ricegrass	ORHY	5-10	---	5-10	---	5-10	---	---
Needlegrass	STIPA	2-10	---	---	5-15	2-10	---	---
Bluegrass	POA++	2-10	---	---	---	2-10	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	---	1- 5	---	---
Desert needlegrass	STSP3	---	5-10	20-40	---	---	---	---
Pine bluegrass	POSC	---	---	---	20-30	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	10-25	5-10	5-15	10-15	---	10-25
Annual grasses	AAGG	1- 5	---	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	2- 5	2- 5	5-10	5-10	---	2- 5
Annual forbs	AAFF	1- 5	---	---	---	1- 5	---	2- 5
Black sagebrush	ARARN	15-20	20-40	---	---	15-20	---	---
Nevada ephedra	EPNE	5-10	2- 5	5-15	5-10	5-10	---	---
Bud sagebrush	ARSP5	2- 5	---	---	---	2- 5	---	---
Winterfat	EULA5	2- 5	---	---	---	2- 5	---	---
Bailey greasewood	SAVEB	---	5-15	---	---	---	---	---
Wyoming big sagebrush	ARTRW	---	---	15-25	10-20	---	---	---
Spiny hopsage	GRSP	---	---	5-15	5-15	---	---	10-20
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	5-15	5-10	5-10	10-20	---	5-15
Range site number		029X014N	027X061N	027X065N	027X007N	029X014N	None	027X029N
Potential production (lb/acre):								
Favorable years		500	200	500	600	500	---	800
Normal years		300	100	300	450	300	---	500
Unfavorable years		100	50	200	300	100	---	100

## 1825--Lomoine-Beelem-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Lomoine	Beelem	Rock outcrop	1	2	3
Desert needlegrass	STSP3	5-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	---	X	---	1- 5	---	---
Indian ricegrass	ORHY	---	X	---	5-10	---	---
Galleta	HLJA	---	---	---	5-15	---	---
Needlegrass	STIPA	---	---	---	2-10	5-15	---
Bluegrass	POA++	---	---	---	2-10	---	---
Pine bluegrass	POSC	---	---	---	---	20-30	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-25	X	---	10-15	5-15	10-25
Annual grasses	AAGG	---	---	---	1- 5	---	---
Perennial forbs	PPFF	2- 5	X	---	5-10	5-10	2- 5
Annual forbs	AAFP	---	---	---	1- 5	---	2- 5
Black sagebrush	ARARN	20-40	X	---	15-20	---	---
Bailey greasewood	SAVEB	5-15	---	---	---	---	---
Nevada ephedra	EPNE	2- 5	X	---	5-10	5-10	---
Wyoming big sagebrush	ARTRW	---	X	---	---	10-20	---
Green ephedra	EPVI	---	X	---	---	---	---
Bud sagebrush	ARSP5	---	---	---	2- 5	---	---
Winterfat	EULA5	---	---	---	2- 5	---	---
Spiny hopsage	GRSP	---	---	---	---	5-15	10-20
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	10-30
Other shrubs	SSSS	5-15	X	---	10-20	5-10	5-15
Utah juniper	JUOS	---	X	---	---	---	---
Singleleaf pinyon	PIMO	---	X	---	---	---	---
Range site number		027X061N	029X081N	None	029X014N	027X007N	027X029N
Potential production (lb/acre):							
Favorable years		200	125	---	500	600	800
Normal years		100	75	---	300	450	500
Unfavorable years		50	25	---	100	300	100

1840--Kyler-Gabbvally association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Kyler	Gabbvally	1	2	3
Galleta	HIJA	5-15	5-15	5-25	---	---
Indian ricegrass	ORHY	5-10	5-10	5-15	2- 5	---
Needlegrass	STIPA	2-10	5-10	5-15	---	---
Bluegrass	POA++	2-10	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 4	1- 5	---	---
Dropseed	SPORO	---	---	5-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	5-20	5-20	1- 3	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 3	---
Perennial forbs	PPFF	5-10	4-10	3-10	1- 4	2- 5
Annual forbs	AAFF	1- 5	2- 7	2- 5	1- 3	2- 5
Black sagebrush	ARARN	15-20	---	---	1-10	---
Nevada ephedra	EPNE	5-10	5-10	---	---	---
Bud sagebrush	ARSP5	2- 5	---	5-10	---	---
Winterfat	EULA5	2- 5	---	2-10	---	---
Wyoming big sagebrush	ARTRW	---	20-30	15-20	1- 5	---
Spiny hopsage	GRSP	---	---	5-10	---	10-20
Littleleaf mountainmahogany	CELEI2	---	---	---	50-75	---
Nevada greasewood	GLNE	---	---	---	10-20	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	10-30
Other shrubs	SSSS	10-20	10-20	10-20	5-15	5-15

Range site number	029X014N	029X010N	029X049N	029X040N	027X029N
Potential production (lb/acre):					
Favorable years	500	600	900	350	800
Normal years	300	400	600	250	500
Unfavorable years	100	200	300	150	100

## 1842--Kyler-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Kyler	Rock outcrop	1	2	3
Galleta	HIJA	5-15	---	5-20	5-15	---
Indian ricegrass	ORHY	5-10	---	5-10	5-10	---
Needlegrass	STIPA	2-10	---	5-15	2-10	---
Bluegrass	POA++	2-10	---	---	2-10	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	1- 5	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	---	10-15	10-15	10-25
Annual grasses	AAGG	1- 5	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	---	3- 8	5-10	2- 5
Annual forbs	AAFF	1- 5	---	2- 5	1- 5	2- 5
Black sagebrush	ARARN	15-20	---	20-25	15-20	---
Nevada ephedra	EPNE	5-10	---	2- 5	5-10	---
Bud sagebrush	ARSP5	2- 5	---	5-10	2- 5	---
Winterfat	EULA5	2- 5	---	2- 5	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	10-20
Other shrubs	SSSS	10-20	---	10-20	10-20	5-15
Range site number		029X014N	None	029X008N	029X014N	027X029N
Potential production (lb/acre):						
Favorable years		500	---	700	500	800
Normal years		300	---	400	300	500
Unfavorable years		100	---	200	100	100

1843--Kyler-Logring-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Kyler	Logring	Rock outcrop	1	2	3	4
Galleta	HIJA	5-15	---	---	---	5-15	5-15	---
Indian ricegrass	ORHY	5-10	---	---	---	5-10	5-10	15-25
Needlegrass	STIPA	2-10	---	---	---	2-10	2-10	---
Bluegrass	POA++	2-10	X	---	X	2-10	2-10	---
Bottlebrush squirreltail	SIHY	1- 5	X	---	X	1- 5	1- 5	---
Needleandthread	STCO4	---	---	---	---	---	---	5-10
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	X	---	X	10-15	10-15	10-20
Annual grasses	AAGG	1- 5	---	---	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	X	---	X	5-10	5-10	5-10
Annual forbs	AAFF	1- 5	---	---	---	1- 5	1- 5	---
Black sagebrush	ARARN	15-20	X	---	X	15-20	15-20	20-30
Nevada ephedra	EPNE	5-10	---	---	---	5-10	5-10	---
Bud sagebrush	ARSP5	2- 5	---	---	---	2- 5	2- 5	2- 5
Winterfat	EULA5	2- 5	---	---	---	2- 5	2- 5	5-10
Green ephedra	EPVI	---	X	---	X	---	---	---
Small rabbitbrush	CHVIS	---	---	---	---	---	---	2- 5
Other shrubs	SSSS	10-20	X	---	X	10-20	10-20	10-20
Utah juniper	JUOS	---	X	---	X	---	---	---
Range site number		029X014N	029X080N	None	029X080N	029X014N	029X014N	028B011N
Potential production (1b/acre):								
Favorable years		500	200	---	200	500	500	1,000
Normal years		300	125	---	125	300	300	700
Unfavorable years		100	50	---	50	100	100	400

1844--Kyler very gravelly fine sandy loam, 15 to 50 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Kyler	1	2	3	4
Galleta	HIJA	5-15	5-15	10-20	---	---
Indian ricegrass	ORHY	5-10	5-10	2- 5	---	15-25
Needlegrass	STIPA	2-10	2-10	5-10	---	---
Bluegrass	POA++	2-10	2-10	---	X	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	---	X	---
Needleandthread	STCO4	---	---	---	---	5-10
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	10-15	5-10	X	10-20
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	5-10	X	5-10
Annual forbs	AAFF	1- 5	1- 5	2- 5	---	---
Black sagebrush	ARARN	15-20	15-20	---	X	20-30
Nevada ephedra	EPNE	5-10	5-10	5-10	---	---
Bud sagebrush	ARSP5	2- 5	2- 5	2- 5	---	2- 5
Winterfat	EULA5	2- 5	2- 5	---	---	5-10
Spiny menodora	MESP2	---	---	10-25	---	---
Bailey greasewood	SAVEB	---	---	5-10	---	---
Anderson wolfberry	LYAN	---	---	5-10	---	---
Shadscale	ATCO	---	---	2- 5	---	---
Green ephedra	EPVI	---	---	---	X	---
Small rabbitbrush	CHVIS	---	---	---	---	2- 5
Other shrubs	SSSS	10-20	10-20	15-25	X	10-20
Utah juniper	JUOS	---	---	---	X	---

Range site number	029X014N	029X014N	029X037N	029X080N	028B011N
Potential production (lb/acre):					
Favorable years	500	500	300	200	1,000
Normal years	300	300	200	125	700
Unfavorable years	100	100	100	50	400

1860--Venable Family, 0 to 8 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Venable Family	1	2
Tufted hairgrass	DECA5	20-40	---	20-40
Sedge	CAREX	15-30	---	15-30
Rush	JUNCU	10-20	---	10-20
Nevada bluegrass	PONE3	10-15	X	10-15
Meadow barley	HOBR2	5-10	---	5-10
Mountain brome	BRMA4	---	X	---
Wheatgrass	AGROP2	---	X	---
Basin wildrye	ELCI2	---	X	---
Other perennial grasses	PPGG	2- 5	X	2- 5
Perennial forbs	PPFF	5-10	X	5-10
Mountain big sagebrush	ARTRV	---	X	---
Snowberry	SYMPH	---	X	---
Other shrubs	SSSS	5-10	---	5-10
Quaking aspen	POTR5	---	X	---

Range site number	027X004N	026X066N	027X004N
Potential production (lb/acre):			
Favorable years	2,500	3,000	2,500
Normal years	1,500	2,500	1,500
Unfavorable years	1,000	2,000	1,000

## 1870--Luning-Sundown association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Luning	Sundown	1	2	3	4
Indian ricegrass	ORHY	30-50	30-50	30-50	10-20	10-20	5-10
Bottlebrush squirreltail	SIHY	---	---	---	5-10	5-10	2- 5
Other perennial grasses	PPGG	2- 5	2- 5	2- 5	5-10	5-10	2- 5
Globemallow	SPHAE	1- 3	1- 3	1- 3	---	---	---
Birdcage eveningprimrose	OEDE2	1- 3	1- 3	1- 3	---	---	---
Other perennial forbs	PPFF	2- 5	2- 5	2- 5	3- 7	3- 7	5-10
Annual forbs	AAFF	---	---	---	2- 5	2- 5	---
Fourwing saltbush	ATCA2	15-30	15-30	15-30	---	---	---
Cooper wolfberry	LYCO2	10-20	10-20	10-20	5-20	5-20	5-15
Nevada dalea	DAPO2	5-10	5-10	5-10	---	---	---
Shadscale	ATCO	---	---	---	10-20	10-20	10-20
Bailey greasewood	SAVEB	---	---	---	5-10	5-10	---
Black greasewood	SAVE4	---	---	---	---	---	30-40
Other shrubs	SSSS	5-15	5-15	5-15	5-15	5-15	2- 5
Range site number		027X060N	027X060N	027X060N	027X043N	027X043N	027X036N
Potential production (lb/acre):							
Favorable years		400	400	400	400	400	200
Normal years		200	200	200	200	200	100
Unfavorable years		100	100	100	100	100	50

1871--Luning sandy loam, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Luning	1	2
Indian ricegrass	ORHY	10-20	10-20	30-50
Bottlebrush squirreltail	SIHY	5-10	5-10	---
Other perennial grasses	PPGG	5-10	5-10	2- 5
Globemallow	SPHAE	---	---	1- 3
Birdcage eveningprimrose	OEDE2	---	---	1- 3
Other perennial forbs	PPFF	3- 7	3- 7	2- 5
Annual forbs	AAFF	2- 5	2- 5	---
Shadscale	ATCO	10-20	10-20	---
Cooper wolfberry	LYCO2	5-20	5-20	10-20
Bailey greasewood	SAVEB	5-10	5-10	---
Fourwing saltbush	ATCA2	---	---	15-30
Nevada dalea	DAPO2	---	---	5-10
Other shrubs	SSSS	5-15	5-15	5-15
Range site number		027X043N	027X043N	027X060N
Potential production (lb/acre):				
Favorable years		400	400	400
Normal years		200	200	200
Unfavorable years		100	100	100

## 1875--Luning-Hawsley-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Luning	Hawsley	Bluewing	1	2
Indian ricegrass	ORHY	30-50	30-50	1-10	10-20	30-50
King desertgrass	BLKI	---	---	1- 2	---	---
Needleandthread	STCO4	---	---	---	5-10	2-10
Other perennial grasses	PPGG	2- 5	2- 5	5-10	2- 5	2-10
Annual grasses	AAGG	---	---	1- 5	---	---
Globemallow	SPHAE	1- 3	1- 3	---	---	---
Birdcage eveningprimrose	OEDE2	1- 3	1- 3	---	---	---
Other perennial forbs	PPFF	2- 5	2- 5	5-10	2- 5	2- 5
Annual forbs	AAFF	---	---	2- 5	2- 5	2- 5
Fourwing saltbush	ATCA2	15-30	15-30	---	---	5-15
Cooper wolfberry	LYCO2	10-20	10-20	5-15	---	---
Nevada dalea	DAPO2	5-10	5-10	---	---	2-10
Shadscale	ATCO	---	---	20-40	---	---
Bailey greasewood	SAVEB	---	---	10-15	---	---
Black greasewood	SAVE4	---	---	---	10-40	---
Winterfat	EULA5	---	---	---	---	2-10
Other shrubs	SSSS	5-15	5-15	5-15	5-20	5-10
Range site number		027X060N	027X060N	029X032N	027X016N	027X009N
Potential production (lb/acre):						
Favorable years		400	400	150	300	800
Normal years		200	200	100	200	450
Unfavorable years		100	100	50	50	200

1877--Luning-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Luning	Izo	1	2
Indian ricegrass	ORHY	30-50	5-10	30-50	10-20
Needleandthread	STCO4	---	---	2-10	---
Bottlebrush squirreltail	SIHY	---	---	---	5-10
Other perennial grasses	PPGG	2- 5	5-10	2-10	5-10
Annual grasses	AAGG	---	2- 4	---	---
Globemallow	SPHAE	1- 3	---	---	---
Birdcage eveningprimrose	OEDE2	1- 3	---	---	---
Other perennial forbs	PPFF	2- 5	2- 6	2- 5	3- 7
Annual forbs	AAFF	---	1- 5	2- 5	2- 5
Fourwing saltbush	ATCA2	15-30	5-15	5-15	---
Cooper wolfberry	LYCO2	10-20	2- 5	---	5-20
Nevada dalea	DAPO2	5-10	---	2-10	---
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Bailey greasewood	SAVEB	---	2-10	---	5-10
Nevada ephedra	EPNE	---	2- 5	---	---
Winterfat	EULA5	---	---	2-10	---
Shadscale	ATCO	---	---	---	10-20
Other shrubs	SSSS	5-15	10-20	5-10	5-15
Range site number		027X060N	029X041N	027X009N	027X043N
Potential production (lb/acre):					
Favorable years		400	500	800	400
Normal years		200	300	450	200
Unfavorable years		100	100	200	100

1878--Luning-Oricto association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Luning	Oricto	1	2	3	4
Indian ricegrass	ORHY	30-50	1-10	5-10	10-20	30-50	---
King desertgrass	BLKI	---	1- 2	---	---	---	---
Bottlebrush squirreltail	SIHY	---	---	---	5-10	---	---
Other perennial grasses	PPGG	2- 5	5-10	5-10	5-10	2- 5	---
Annual grasses	AAGG	---	1- 5	2- 4	---	---	---
Globemallow	SPHAE	1- 3	---	---	---	1- 3	---
Birdcage eveningprimrose	OEDE2	1- 3	---	---	---	1- 3	---
Other perennial forbs	PPFF	2- 5	5-10	2- 6	3- 7	2- 5	---
Annual forbs	AAFF	---	2- 5	1- 5	2- 5	---	---
Fourwing saltbush	ATCA2	15-30	---	5-15	---	15-30	---
Cooper wolfberry	LYCO2	10-20	5-15	2- 5	5-20	10-20	---
Nevada dalea	DAPO2	5-10	---	---	---	5-10	---
Shadscale	ATCO	---	20-40	---	10-20	---	---
Bailey greasewood	SAVEB	---	10-15	2-10	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Nevada ephedra	EPNE	---	---	2- 5	---	---	---
Other shrubs	SSSS	5-15	5-15	10-20	5-15	5-15	---
Range site number		027X060N	029X032N	029X041N	027X043N	027X060N	None
Potential production (lb/acre):							
Favorable years		400	150	500	400	400	---
Normal years		200	100	300	200	200	---
Unfavorable years		100	50	100	100	100	---

1879--Luning-Eastgate association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Luning	Eastgate	1	2
Indian ricegrass	ORHY	30-50	30-50	1-10	10-20
King desertgrass	BLKI	---	---	1- 2	---
Needleandthread	STCO4	---	---	---	5-10
Other perennial grasses	PPGG	2- 5	2- 5	5-10	2- 5
Annual grasses	AAGG	---	---	1- 5	---
Globemallow	SPHAE	1- 3	1- 3	---	---
Birdcage eveningprimrose	OEDE2	1- 3	1- 3	---	---
Other perennial forbs	PPFF	2- 5	2- 5	5-10	2- 5
Annual forbs	AAFF	---	---	2- 5	2- 5
Fourwing saltbush	ATCA2	15-30	15-30	---	---
Cooper wolfberry	LYCO2	10-20	10-20	5-15	---
Nevada dalea	DAPO2	5-10	5-10	---	---
Shadscale	ATCO	---	---	20-40	---
Bailey greasewood	SAVEB	---	---	10-15	---
Black greasewood	SAVE4	---	---	---	10-40
Other shrubs	SSSS	5-15	5-15	5-15	5-20

Range site number	027X060N	027X060N	029X032N	027X016N
Potential production (lb/acre):				
Favorable years	400	400	150	300
Normal years	200	200	100	200
Unfavorable years	100	100	50	50

## 1890--Wardenot, moderately steep-Wardenot-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Wardenot, moderately steep	Wardenot	Izo	1	2	3	4
Indian ricegrass	ORHY	5-20	5-20	5-20	5-10	5-20	---	---
Galleta	HIJA	5-10	5-10	5-10	---	5-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	---	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	5-10	2- 6	5-10	---	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5	1- 5	2- 5	---	2- 5
Spiny menodora	MESP2	10-30	10-30	10-30	---	10-30	---	---
Bailey greasewood	SAVEB	5-15	5-15	5-15	2-10	5-15	---	---
Shadscale	ATCO	5-15	5-15	5-15	---	5-15	---	---
Bud sagebrush	ARSP5	5-10	5-10	5-10	---	5-10	---	---
Nevada ephedra	EPNE	5-10	5-10	5-10	2- 5	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	---	---	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	---	10-20
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20	---	5-15
Range site number		029X036N	029X036N	029X036N	029X041N	029X036N	None	027X029N
Potential production (lb/acre):								
Favorable years		400	400	400	500	400	---	800
Normal years		300	300	300	300	300	---	500
Unfavorable years		100	100	100	100	100	---	100

1891--Wardenot-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Wardenot	Izo	1	2	3
Galleta	HIJA	10-25	---	10-25	10-20	5-10
Indian ricegrass	ORHY	5-10	5-10	5-10	2- 5	5-20
Bottlebrush squirreltail	SIHY	2- 5	---	2- 5	---	---
Needlegrass	STIPA	2- 5	---	2- 5	5-10	---
Dropseed	SPORO	2- 5	---	2- 5	---	---
Other perennial grasses	PPGG	5-15	5-10	5-15	5-10	5-10
Annual grasses	AAGG	1- 5	2- 4	1- 5	1- 5	1- 5
Perennial forbs	PPFF	4-10	2- 6	4-10	5-10	5-10
Annual forbs	AAFF	1- 5	1- 5	1- 5	2- 5	2- 5
Shadscale	ATCO	10-25	---	10-25	2- 5	5-15
Bailey greasewood	SAVEB	5-10	2-10	5-10	5-10	5-15
Bud sagebrush	ARSP5	5-10	---	5-10	2- 5	5-10
Winterfat	EULA5	5-10	---	5-10	---	---
Nevada ephedra	EPNE	1- 5	2- 5	1- 5	5-10	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---
Spiny menodora	MESP2	---	---	---	10-25	10-30
Anderson wolfberry	LYAN	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	10-20	15-25	10-20
Range site number		029X017N	029X041N	029X017N	029X037N	029X036N
Potential production (lb/acre):						
Favorable years		350	500	350	300	400
Normal years		250	300	250	200	300
Unfavorable years		100	100	100	100	100

## 1892--Wardenot, moist-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Wardenot	Izo	1	2
Indian ricegrass	ORHY	5-20	5-10	5-20	5-20
Galleta	HIJA	5-10	---	5-10	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	2- 6	5-10	5-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	---	10-30	10-30
Bailey greasewood	SAVEB	5-15	2-10	5-15	5-15
Shadscale	ATCO	5-15	---	5-15	5-15
Bud sagebrush	ARSP5	5-10	---	5-10	5-10
Nevada ephedra	EPNE	5-10	2- 5	5-10	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20
Range site number		029X036N	029X041N	029X036N	029X036N
Potential production (lb/acre):					
Favorable years		400	500	400	400
Normal years		300	300	300	300
Unfavorable years		100	100	100	100

1893--Wardenot-Annaw-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Wardenot	Annaw	Izo	1	2	3
Indian ricegrass	ORHY	5-20	5-20	5-10	5-20	5-20	5-20
Galleta	HIJA	5-10	5-10	---	5-10	5-10	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 6	5-10	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	10-30	---	10-30	10-30	10-30
Bailey greasewood	SAVEB	5-15	5-15	2-10	5-15	5-15	5-15
Shadscale	ATCO	5-15	5-15	---	5-15	5-15	5-15
Bud sagebrush	ARSP5	5-10	5-10	---	5-10	5-10	5-10
Nevada ephedra	EPNE	5-10	5-10	2- 5	5-10	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20	10-20

Range site number	029X036N	029X036N	029X041N	029X036N	029X036N	029X036N
Potential production (lb/acre):						
Favorable years	400	400	500	400	400	400
Normal years	300	300	300	300	300	300
Unfavorable years	100	100	100	100	100	100



1897--Wardenot-Stumble-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Wardenot	Stumble	Izo	1	2	3
Indian ricegrass	ORHY	5-20	30-50	5-10	5-20	15-25	5-20
Galleta	HIJA	5-10	---	---	5-10	---	5-10
Needleandthread	STCO4	---	2-10	---	---	10-15	---
Other perennial grasses	PPGG	5-10	2-10	5-10	5-10	---	5-10
Annual grasses	AAGG	1- 5	---	2- 4	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	2- 5	2- 6	5-10	2- 5	5-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	---	---	10-30	---	10-30
Bailey greasewood	SAVEB	5-15	---	2-10	5-15	---	5-15
Shadscale	ATCO	5-15	---	---	5-15	---	5-15
Bud sagebrush	ARSP5	5-10	---	---	5-10	---	5-10
Nevada ephedra	EPNE	5-10	---	2- 5	5-10	---	5-10
Fourwing saltbush	ATCA2	---	5-15	5-15	---	10-20	---
Winterfat	EULA5	---	2-10	---	---	---	---
Nevada dalea	DAPO2	---	2-10	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	5-10	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	---
Hairy horsebrush	TECO2	---	---	---	---	30-40	---
Other shrubs	SSSS	10-20	5-10	10-20	10-20	5-10	10-20
Range site number		029X036N	027X009N	029X041N	029X036N	027X023N	029X036N
Potential production (lb/acre):							
Favorable years		400	800	500	400	300	400
Normal years		300	450	300	300	200	300
Unfavorable years		100	200	100	100	100	100

1910--Izo, rarely flooded-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Izo, rarely flooded	Izo	1	2	3	4
Indian ricegrass	ORHY	5-20	5-10	5-20	10-20	5-20	5-20
Galleta	HIJA	5-10	---	5-10	---	5-10	5-10
Bottlebrush squirreltail	SIHY	---	---	---	5-10	---	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	2- 4	1- 5	---	1- 5	1- 5
Perennial forbs	PPFF	5-10	2- 6	5-10	3- 7	5-10	5-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	---	10-30	---	10-30	10-30
Bailey greasewood	SAVEB	5-15	2-10	5-15	5-10	5-15	5-15
Shadscale	ATCO	5-15	---	5-15	10-20	5-15	5-15
Bud sagebrush	ARSP5	5-10	---	5-10	---	5-10	5-10
Nevada ephedra	EPNE	5-10	2- 5	5-10	---	5-10	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---	---	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	5-20	---	---
Other shrubs	SSSS	10-20	10-20	10-20	5-15	10-20	10-20
Range site number		029X036N	029X041N	029X036N	027X043N	029X036N	029X036N
Potential production (lb/acre):							
Favorable years		400	500	400	400	400	400
Normal years		300	300	300	200	300	300
Unfavorable years		100	100	100	100	100	100

1930--Cirac fine sandy loam, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Cirac	1	2
Indian ricegrass	ORHY	5-10	10-20	---
Bottlebrush squirreltail	SIHY	2- 5	5-10	---
Inland saltgrass	DIST	---	---	5-10
Other perennial grasses	PPGG	2- 5	5-10	5-15
Perennial forbs	PPFF	5-10	3- 7	3- 7
Annual forbs	AAFF	---	2- 5	---
Black greasewood	SAVE4	30-40	---	40-60
Shadscale	ATCO	10-20	10-20	2-10
Cooper wolfberry	LYCO2	5-15	5-20	---
Bailey greasewood	SAVEB	---	5-10	---
Seepweed	SUAED	---	---	2- 5
Other shrubs	SSSS	2- 5	5-15	5-15

Range site number	027X036N	027X043N	027X025N
Potential production (lb/acre):			
Favorable years	200	400	400
Normal years	100	200	200
Unfavorable years	50	100	50

## 1931--Cirac fine sandy loam, ponded, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
			Cirac	1	2
Inland saltgrass	DIST	5-10	---	5-10	5-10
Indian ricegrass	ORHY	---	10-20	---	---
Needleandthread	STCO4	---	5-10	---	---
Basin wildrye	ELCI2	---	---	---	30-50
Alkali sacaton	SPAI	---	---	---	5-10
Creeping wildrye	ELTR3	---	---	---	5-10
Other perennial grasses	PPGG	5-15	2- 5	5-15	---
Perennial forbs	PPFF	3- 7	2- 5	3- 7	5-10
Annual forbs	AAFF	---	2- 5	---	---
Black greasewood	SAVE4	40-60	10-40	40-60	5-15
Shadscale	ATCO	2-10	---	2-10	5-15
Seepweed	SUAED	2- 5	---	2- 5	---
Basin big sagebrush	ARTRT	---	---	---	2- 5
Rubber rabbitbrush	CHNA2	---	---	---	2- 5
Other shrubs	SSSS	5-15	5-20	5-15	5-10

Range site number	027X025N	027X016N	027X025N	027X006N
Potential production (lb/acre):				
Favorable years	400	300	400	2,000
Normal years	200	200	200	1,500
Unfavorable years	50	50	50	1,000

1940--Typic Torriorthents, 15 to 75 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Typic Torriorthents	1	2
Indian ricegrass	ORHY	2- 5	5-10	5-10
King desertgrass	BLKI	1- 2	---	---
Bottlebrush squirreltail	SIHY	1- 2	---	2- 5
Galleta	HIJA	---	---	10-25
Needlegrass	STIPA	---	---	2- 5
Dropseed	SPORO	---	---	2- 5
Other perennial grasses	PPGG	1- 5	5-10	5-15
Annual grasses	AAGG	1- 5	2- 4	1- 5
Perennial forbs	PPFF	2- 5	2- 6	4-10
Annual forbs	AAFF	1- 5	1- 5	1- 5
Shadscale	ATCO	40-60	---	10-25
Bailey greasewood	SAVEB	10-15	2-10	5-10
Nevada dalea	DAPO2	5-10	---	---
Cooper wolfberry	LYCO2	2- 5	2- 5	---
Bud sagebrush	ARSP5	2- 5	---	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---
Fourwing saltbush	ATCA2	---	5-15	---
Burrobrush	HYMEN3	---	5-10	---
Littleleaf horsebrush	TEGL	---	5-10	---
Nevada ephedra	EPNE	---	2- 5	1- 5
Winterfat	EULA5	---	---	5-10
Other shrubs	SSSS	5-15	10-20	10-20
Range site number		029X033N	029X041N	029X017N
Potential production (lb/acre):				
Favorable years		100	500	350
Normal years		50	300	250
Unfavorable years		25	100	100

1950--Lathrop-Terlco-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Lathrop	Terlco	Izo	1	2	3
Indian ricegrass	ORHY	5-20	5-20	5-10	2- 5	2- 5	5-20
Galleta	HIJA	5-10	5-10	---	10-20	10-20	5-10
Needlegrass	STIPA	---	---	---	5-10	5-10	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 6	5-10	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	10-30	---	10-25	10-25	10-30
Bailey greasewood	SAVEB	5-15	5-15	2-10	5-10	5-10	5-15
Shadscale	ATCO	5-15	5-15	---	2- 5	2- 5	5-15
Bud sagebrush	ARSP5	5-10	5-10	---	2- 5	2- 5	5-10
Nevada ephedra	EPNE	5-10	5-10	2- 5	5-10	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	---
Anderson wolfberry	LYAN	---	---	---	5-10	5-10	---
Other shrubs	SSSS	10-20	10-20	10-20	15-25	15-25	10-20
Range site number		029X036N	029X036N	029X041N	029X037N	029X037N	029X036N
Potential production (lb/acre):							
Favorable years		400	400	500	300	300	400
Normal years		300	300	300	200	200	300
Unfavorable years		100	100	100	100	100	100

1951--Lathrop-Belted-Veet association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Lathrop	Belted	Veet	1	2	3	4
Indian ricegrass	ORHY	5-20	5-20	5-15	5-10	5-10	5-10	---
Galleta	HIJA	5-10	5-10	5-25	5-15	5-15	5-20	---
Needlegrass	STIPA	---	---	5-15	2-10	2-10	2- 5	---
Dropseed	SPORO	---	---	5-10	---	---	5-15	---
Bottlebrush squirreltail	SIHY	---	---	1- 5	1- 5	1- 5	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-10	5-20	10-20	10-20	5-10	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	5-10	3-10	5-10	5-10	5- 7	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	2- 5	2- 4	2- 5
Spiny menodora	MESP2	10-30	10-30	---	---	---	---	---
Bailey greasewood	SAVEB	5-15	5-15	---	---	---	---	---
Shadscale	ATCO	5-15	5-15	---	---	---	---	---
Bud sagebrush	ARSP5	5-10	5-10	5-10	---	---	5-10	---
Nevada ephedra	EPNE	5-10	5-10	---	2- 5	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	15-20	15-20	15-20	---	---
Spiny hopsage	GRSP	---	---	5-10	2- 5	2- 5	2- 8	10-20
Winterfat	EULA5	---	---	2-10	2- 5	2- 5	5-20	---
Fourwing saltbush	ATCA2	---	---	---	5-10	5-10	10-15	---
Anderson wolfberry	LYAN	---	---	---	---	---	1- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	10-20	10-20	10-25	10-25	10-25	5-15

Range site number	029X036N	029X036N	029X049N	029X006N	029X006N	029X046N	027X029N
Potential production (lb/acre):							
Favorable years	400	400	900	800	800	450	800
Normal years	300	300	600	500	500	350	500
Unfavorable years	100	100	300	300	300	175	100

## 1970--Pintwater-Blacktop-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Pintwater	Blacktop	Rock outcrop	1	2	3	4
Galleta	HIJA	10-20	---	---	---	5-10	5-15	---
Indian ricegrass	ORHY	2- 5	2- 5	---	---	5-20	5-10	---
Needlegrass	STIPA	5-10	---	---	5-15	---	2-10	---
King desertgrass	BLKI	---	1- 2	---	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 2	---	---	---	1- 5	---
Pine bluegrass	POSC	---	---	---	20-30	---	---	---
Bluegrass	POA++	---	---	---	---	---	2-10	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	1- 5	---	5-15	5-10	10-15	10-25
Annual grasses	AAGG	1- 5	1- 5	---	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	2- 5	---	5-10	5-10	5-10	2- 5
Annual forbs	AAFF	2- 5	1- 5	---	---	2- 5	1- 5	2- 5
Nevada ephedra	EPNE	5-10	---	---	5-10	5-10	5-10	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	5-10	2- 5	---
Spiny menodora	MESP2	10-25	---	---	---	10-30	---	---
Bailey greasewood	SAVEB	5-10	10-15	---	---	5-15	---	---
Anderson wolfberry	LYAN	5-10	---	---	---	---	---	---
Shadscale	ATCO	2- 5	40-60	---	---	5-15	---	---
Nevada dalea	DAPO2	---	5-10	---	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---	---	---
Wyoming big sagebrush	ARTRW	---	---	---	10-20	---	---	---
Spiny hopsage	GRSP	---	---	---	5-15	---	---	10-20
Black sagebrush	ARARN	---	---	---	---	---	15-20	---
Winterfat	EULA5	---	---	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	15-25	5-15	---	5-10	10-20	10-20	5-15
Range site number		029X037N	029X033N	None	027X007N	029X036N	029X014N	027X029N
Potential production (lb/acre):								
Favorable years		300	100	---	600	400	500	800
Normal years		200	50	---	450	300	300	500
Unfavorable years		100	25	---	300	100	100	100

1972--Pintwater-Terlco association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Pintwater	Terlco	1	2	3	4
Galleta	HIJA	10-20	5-10	5-10	---	---	---
Indian ricegrass	ORHY	2- 5	5-20	5-20	5-10	2- 5	---
Needlegrass	STIPA	5-10	---	---	---	---	---
King desertgrass	BLKI	---	---	---	---	1- 2	---
Bottlebrush squirreltail	SIHY	---	---	---	---	1- 2	---
Desert needlegrass	STSP3	---	---	---	---	---	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	1- 5	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	1- 5	---
Perennial forbs	PPFF	5-10	5-10	5-10	2- 6	2- 5	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5	1- 5	1- 5	---
Nevada ephedra	EPNE	5-10	5-10	5-10	2- 5	---	2- 5
Bud sagebrush	ARSP5	2- 5	5-10	5-10	---	2- 5	---
Spiny menodora	MESP2	10-25	10-30	10-30	---	---	---
Bailey greasewood	SAVEB	5-10	5-15	5-15	2-10	10-15	5-15
Anderson wolfberry	LYAN	5-10	---	---	---	---	---
Shadscale	ATCO	2- 5	5-15	5-15	---	40-60	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	2- 5	---
Nevada galea	JAPO2	---	---	---	---	5-10	---
Black sagebrush	ARARN	---	---	---	---	---	20-40
Other shrubs	SSSS	15-25	10-20	10-20	10-20	5-15	5-15

Range site number	029X037N	029X036N	029X036N	029X041N	029X033N	027X061N
Potential production (lb/acre):						
Favorable years	300	400	400	500	100	200
Normal years	200	300	300	300	50	100
Unfavorable years	100	100	100	100	25	50

## 1980--Tert-Whilphang-Armespan association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Tert	Whilphang	Armespan	1	2
Bottlebrush squirreltail	SIHY	2- 5	---	---	---	---
Galleta	HIJA	2- 5	5-20	5-20	---	---
Indian ricegrass	ORHY	2- 5	5-10	5-10	15-25	---
Needlegrass	STIPA	---	5-15	5-15	---	---
Needleandthread	STCO4	---	---	---	5-10	---
Basin wildrye	ELCI2	---	---	---	2- 5	2- 5
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Other perennial grasses	PPGG	2- 5	10-15	10-15	10-20	10-25
Annual grasses	AAGG	---	1- 5	1- 5	---	---
Perennial forbs	PPFF	2- 8	3- 8	3- 8	5-10	2- 5
Annual forbs	AAFF	1- 2	2- 5	2- 5	---	2- 5
Black sagebrush	ARARN	5-15	20-25	20-25	20-30	---
Nevada ephedra	EPNE	5-15	2- 5	2- 5	---	---
Mexican cliffrose	COME5	2-10	---	---	---	---
Shadscale	ATCO	2-10	---	---	---	---
Bud sagebrush	ARSP5	---	5-10	5-10	2- 5	---
Winterfat	EULA5	---	2- 5	2- 5	5-10	---
Small rabbitbrush	CHVIS	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	10-20
Other shrubs	SSSS	5-15	10-20	10-20	10-20	5-15
Utah juniper	JUOS	2- 5	---	---	---	---
Range site number		027X066N	029X008N	029X008N	028B011N	027X029N
Potential production (lb/acre):						
Favorable years		100	700	700	1,000	800
Normal years		75	400	400	700	500
Unfavorable years		50	200	200	400	100

1981--Tert-Whilphang-Geer association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Tert	Whilphang	Geer	1	2	3	4
Bottlebrush squirreltail	SIHY	2- 5	---	1- 5	1- 5	---	---	---
Galleta	HIJA	2- 5	5-20	5-20	5-25	5-20	---	---
Indian ricegrass	ORHY	2- 5	5-10	5-15	5-15	5-10	---	---
Needlegrass	STIPA	---	5-15	2-10	5-15	2- 5	---	---
Dropseed	SPORO	---	---	5-10	5-10	5-15	---	---
Other perennial grasses	PPGG	2- 5	10-15	5-10	5-20	5-10	---	---
Annual grasses	AAGG	---	1- 5	1- 5	1- 5	1- 5	---	---
Perennial forbs	PPFF	2- 8	3- 8	5-10	3-10	5- 7	---	---
Annual forbs	AAFF	1- 2	2- 5	1- 5	2- 5	2- 4	---	---
Black sagebrush	ARARN	5-15	20-25	---	---	---	---	---
Nevada ephedra	EPNE	5-15	2- 5	1- 5	---	---	---	---
Mexican cliffrose	COME5	2-10	---	---	---	---	---	---
Shadscale	ATCO	2-10	---	---	---	---	---	---
Bud sagebrush	ARSP5	---	5-10	10-15	5-10	5-10	---	---
Winterfat	EULA5	---	2- 5	20-30	2-10	5-20	---	---
Fourwing saltbush	ATCA2	---	---	2-10	---	10-15	---	---
Wyoming big sagebrush	ARTRW	---	---	---	15-20	---	---	---
Spiny hopsage	GRSP	---	---	---	5-10	2- 8	---	---
Anderson wolfberry	LYAN	---	---	---	---	1- 5	---	---
Other shrubs	SSSS	5-15	10-20	10-15	10-20	10-25	---	---
Utah juniper	JUOS	2- 5	---	---	---	---	---	---

Range site number	027X066N	029X008N	029X020N	029X049N	029X046N	None	None
Potential production (lb/acre):							
Favorable years	100	700	400	900	450	---	---
Normal years	75	400	250	600	350	---	---
Unfavorable years	50	200	100	300	175	---	---

## 1982--Tert-Badland association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Tert	Badland	1	2	3	4
Bottlebrush squirreltail	SIHY	2- 5	---	1- 5	2- 5	---	---
Galleta	HIJA	2- 5	---	5-25	2- 5	---	---
Indian ricegrass	ORHY	2- 5	---	5-15	2- 5	15-25	---
Needlegrass	STIPA	---	---	5-15	---	---	---
Dropseed	SPORO	---	---	5-10	---	---	---
Needleandthread	STCO4	---	---	---	---	5-10	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	2- 5	---	5-20	2- 5	10-20	---
Annual grasses	AAGG	---	---	1- 5	---	---	---
Perennial forbs	PPFF	2- 8	---	3-10	2- 8	5-10	---
Annual forbs	AAFF	1- 2	---	2- 5	1- 2	---	---
Black sagebrush	ARARN	5-15	---	---	5-15	20-30	---
Nevada ephedra	EPNE	5-15	---	---	5-15	---	---
Mexican cliffrose	COME5	2-10	---	---	2-10	---	---
Shadscale	ATCO	2-10	---	---	2-10	---	---
Wyoming big sagebrush	ARTRW	---	---	15-20	---	---	---
Spiny hopsage	GRSP	---	---	5-10	---	---	---
Bud sagebrush	ARSP5	---	---	5-10	---	2- 5	---
Winterfat	EULA5	---	---	2-10	---	5-10	---
Small rabbitbrush	CHVIS	---	---	---	---	2- 5	---
Other shrubs	SSSS	5-15	---	10-20	5-15	10-20	---
Utah juniper	JUOS	2- 5	---	---	2- 5	---	---
Range site number		027X066N	None	029X049N	027X066N	028B011N	None
Potential production (lb/acre):							
Favorable years		100	---	900	100	1,000	---
Normal years		75	---	600	75	700	---
Unfavorable years		50	---	300	50	400	---

1983--Tert-Roic association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Tert	Roic	1	2
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---	---
Galleta	HIJA	2- 5	10-25	5-20	---
Indian ricegrass	ORHY	2- 5	5-10	5-10	15-25
Needlegrass	STIPA	---	2- 5	5-15	---
Dropseed	SPORO	---	2- 5	---	---
Needleandthread	STCO4	---	---	---	10-15
Other perennial grasses	PPGG	2- 5	5-15	10-15	---
Annual grasses	AAGG	---	1- 5	1- 5	---
Perennial forbs	PPFF	2- 8	4-10	3- 8	2- 5
Annual forbs	AAFF	1- 2	1- 5	2- 5	2- 5
Black sagebrush	ARARN	5-15	---	20-25	---
Nevada ephedra	EPNE	5-15	1- 5	2- 5	---
Mexican cliffrose	COME5	2-10	---	---	---
Shadscale	ATCO	2-10	10-25	---	---
Bailey greasewood	SAVEB	---	5-10	---	---
Bud sagebrush	ARSP5	---	5-10	5-10	---
Winterfat	EULA5	---	5-10	2- 5	---
Hairy horsebrush	TECO2	---	---	---	30-40
Fourwing saltbush	ATCA2	---	---	---	10-20
Nevada dalea	DAPO2	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	5-10
Other shrubs	SSSS	5-15	10-20	10-20	5-10
Utah juniper	JUOS	2- 5	---	---	---

Range site number	027X066N	029X017N	029X008N	027X023N
Potential production (lb/acre):				
Favorable years	100	350	700	300
Normal years	75	250	400	200
Unfavorable years	50	100	200	100

## 1990--Whilphang-Armespan association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Whilphang	Armespan	1	2	3
Galleta	HIJA	5-20	5-20	---	2- 5	5-25
Needlegrass	STIPA	5-15	5-15	---	---	5-15
Indian ricegrass	ORHY	5-10	5-10	15-25	2- 5	5-15
Needleandthread	STCO4	---	---	5-10	---	---
Basin wildrye	ELCI2	---	---	2- 5	---	---
Bottlebrush squirreltail	SIHY	---	---	---	2- 5	1- 5
Dropseed	SPORO	---	---	---	---	5-10
Other perennial grasses	PPGG	10-15	10-15	10-20	2- 5	5-20
Annual grasses	AAGG	1- 5	1- 5	---	---	1- 5
Perennial forbs	PPFF	3- 8	3- 8	5-10	2- 8	3-10
Annual forbs	AAFF	2- 5	2- 5	---	1- 2	2- 5
Black sagebrush	ARARN	20-25	20-25	20-30	5-15	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	5-10
Winterfat	EULA5	2- 5	2- 5	5-10	---	2-10
Nevada ephedra	EPNE	2- 5	2- 5	---	5-15	---
Small rabbitbrush	CHVIS	---	---	2- 5	---	---
Mexican cliffrose	COME5	---	---	---	2-10	---
Shadscale	ATCO	---	---	---	2-10	---
Wyoming big sagebrush	ARTRW	---	---	---	---	15-20
Spiny hopsage	GRSP	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	10-20	5-15	10-20
Utah juniper	JUOS	---	---	---	2- 5	---
Range site number		029X008N	029X008N	028B011N	027X066N	029X049N
Potential production (lb/acre):						
Favorable years		700	700	1,000	100	900
Normal years		400	400	700	75	600
Unfavorable years		200	200	400	50	300

2002--Sodaspring-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Sodaspring	Izo	1	2	3
Indian ricegrass	ORHY	10-20	5-10	10-20	10-20	5-10
Bottlebrush squirreltail	SIHY	5-10	---	5-10	5-10	2- 5
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	2- 5
Annual grasses	AAGG	---	2- 4	---	---	---
Perennial forbs	PPFF	3- 7	2- 6	3- 7	3- 7	5-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5	---
Shadscale	ATCO	10-20	-	10-20	10-20	10-20
Cooper wolfberry	LYCO2	5-20	2- 5	5-20	5-20	5-15
Bailey greasewood	SAVEB	5-10	2-10	5-10	5-10	---
Rubber rabbitbrush	CHNA2	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---	---
Nevada ephedra	EPNE	---	2- 5	---	---	---
Black greasewood	SAVE4	---	---	---	---	30-40
Other shrubs	SSSS	5-15	10-20	5-15	5-15	2- 5

Range site number	027X043N	029X041N	027X043N	027X043N	027X036N
Potential production (lb/acre):					
Favorable years	400	500	400	400	200
Normal years	200	300	200	200	100
Unfavorable years	100	100	100	100	50

## 2011--Nuahs loamy sand, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Nuahs	1	2	3
Indian ricegrass	ORHY	10-20	1-10	10-20	10-20
Bottlebrush squirreltail	SIHY	5-10	---	5-10	5-10
King desertgrass	BLKI	---	1- 2	---	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Annual grasses	AAGG	---	1- 5	---	---
Perennial forbs	PPFF	3- 7	5-10	3- 7	3- 7
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5
Shadscale	ATCO	10-20	20-40	10-20	10-20
Cooper wolfberry	LYCO2	5-20	5-15	5-20	5-20
Bailey greasewood	SAVEB	5-10	10-15	5-10	5-10
Other shrubs	SSSS	5-15	5-15	5-15	5-15
Range site number		027X043N	029X032N	027X043N	027X043N
Potential production (lb/acre):					
Favorable years		400	150	400	400
Normal years		200	100	200	200
Unfavorable years		100	50	100	100

2020--Armespan-Whilphang-Wrango association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Armespan	Whilphang	Wrango	1	2	3	4
Galleta	HIJA	5-20	5-20	---	2- 5	5-20	---	5-10
Needlegrass	STIPA	5-15	5-15	---	---	5-15	---	---
Indian ricegrass	ORHY	5-10	5-10	15-25	2- 5	5-10	---	5-20
Needleandthread	STCO4	---	---	5-10	---	---	---	---
Basin wildrye	ELCI2	---	---	2- 5	---	---	2- 5	---
Bottlebrush squirreltail	SIHY	---	---	---	2- 5	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-15	10-15	10-20	2- 5	10-15	10-25	5-10
Annual grasses	AAGG	1- 5	1- 5	---	---	1- 5	---	1- 5
Perennial forbs	PPFF	3- 8	3- 8	5-10	2- 8	3- 8	2- 5	5-10
Annual forbs	AAFF	2- 5	2- 5	---	1- 2	2- 5	2- 5	2- 5
Black sagebrush	ARARN	20-25	20-25	20-30	5-15	20-25	---	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	5-10	---	5-10
Winterfat	EULA5	2- 5	2- 5	5-10	---	2- 5	---	---
Nevada ephedra	EPNE	2- 5	2- 5	---	5-15	2- 5	---	5-10
Small rabbitbrush	CHVIS	---	---	2- 5	---	---	---	---
Mexican cliffrose	COME5	---	---	---	2-10	---	---	---
Shadscale	ATCO	---	---	---	2-10	---	---	5-15
Big sagebrush	ARTR2	---	---	---	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	---	---	---	10-30	---
Spiny hopsage	GRSP	---	---	---	---	---	10-20	---
Spiny menodora	MESP2	---	---	---	---	---	---	10-30
Bailey greasewood	SAVEB	---	---	---	---	---	---	5-15
Other shrubs	SSSS	10-20	10-20	10-20	5-15	10-20	5-15	10-20
Utah juniper	JUOS	---	---	---	2- 5	---	---	---

Range site number	029X008N	029X008N	028B011N	027X066N	029X008N	027X029N	029X036N
Potential production (lb/acre):							
Favorable years	700	700	1,000	100	700	800	400
Normal years	400	400	700	75	400	500	300
Unfavorable years	200	200	400	50	200	100	100

## 2022--Armespan-Whilphang-Geer association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Armespan	Whilphang	Geer	1	2	3	4
Galleta	HIJA	5-20	5-20	5-20	2- 5	---	5-15	5-25
Needlegrass	STIPA	5-15	5-15	2-10	---	---	2-10	5-15
Indian ricegrass	ORHY	5-10	5-10	5-15	2- 5	15-25	5-10	5-15
Dropseed	SPORO	---	---	5-10	---	---	---	5-10
Bottlebrush squirreltail	SIHY	---	---	1- 5	2- 5	---	1- 5	1- 5
Needleandthread	STCO4	---	---	---	---	5-10	---	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---	---
Bluegrass	POA++	---	---	---	---	---	2-10	---
Other perennial grasses	PPGG	10-15	10-15	5-10	2- 5	10-20	10-15	5-20
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	---	1- 5	1- 5
Perennial forbs	PPFF	3- 8	3- 8	5-10	2- 8	5-10	5-10	3-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	1- 2	---	1- 5	2- 5
Black sagebrush	ARARN	20-25	20-25	---	5-15	20-30	15-20	---
Bud sagebrush	ARSP5	5-10	5-10	10-15	---	2- 5	2- 5	5-10
Winterfat	EULA5	2- 5	2- 5	20-30	---	5-10	2- 5	2-10
Nevada ephedra	EPNE	2- 5	2- 5	1- 5	5-15	---	5-10	---
Fourwing saltbush	ATCA2	---	---	2-10	---	---	---	---
Mexican cliffrose	COME5	---	---	---	2-10	---	---	---
Shadscale	ATCO	---	---	---	2-10	---	---	---
Small rabbitbrush	CHVIS	---	---	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	---	15-20
Spiny hopsage	GRSP	---	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	10-15	5-15	10-20	10-20	10-20
Utah juniper	JUOS	---	---	---	2- 5	---	---	---
Range site number		029X008N	029X008N	029X020N	027X066N	028B011N	029X014N	029X049N
Potential production (lb/acre):								
Favorable years		700	700	400	100	1,000	500	900
Normal years		400	400	250	75	700	300	600
Unfavorable years		200	200	100	50	400	100	300

2023--Armespan-Wrango association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Armespan	Wrango	1	2	3	4
Galleta	HIJA	5-20	---	5-20	5-10	5-20	---
Needlegrass	STIPA	5-15	---	5-15	---	2-10	---
Indian ricegrass	ORHY	5-10	15-25	5-10	5-20	5-15	---
Needleandthread	STCO4	---	5-10	---	---	---	---
Basin wildrye	ELCI2	---	2- 5	---	---	---	2- 5
Dropseed	SPORO	---	---	---	---	5-10	---
Bottlebrush squirreltail	SIHY	---	---	---	---	1- 5	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	10-20	10-15	5-10	5-10	10-25
Annual grasses	AAGG	1- 5	---	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	3- 8	5-10	3- 8	5-10	5-10	2- 5
Annual forbs	AAFF	2- 5	---	2- 5	2- 5	1- 5	2- 5
Black sagebrush	ARARN	20-25	20-30	20-25	---	---	---
Bud sagebrush	ARSP5	5-10	2- 5	5-10	5-10	10-15	---
Winterfat	EULA5	2- 5	5-10	2- 5	---	20-30	---
Nevada ephedra	EPNE	2- 5	---	2- 5	5-10	1- 5	---
Small rabbitbrush	CHVIS	---	2- 5	---	---	---	---
Spiny menodora	MESP2	---	---	---	10-30	---	---
Bailey greasewood	SAVEB	---	---	---	5-15	---	---
Shadscale	ATCO	---	---	---	5-15	---	---
Fourwing saltbush	ATCA2	---	---	---	---	2-10	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	10-20
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-15	5-15

Range site number	029X008N	028B011N	029X008N	029X036N	029X020N	027X029N
Potential production (lb/acre):						
Favorable years	700	1,000	700	400	400	800
Normal years	400	700	400	300	250	500
Unfavorable years	200	400	200	100	100	100

2030--Theriot-Theriot, very steep-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Theriot	Theriot, very steep	Rock outcrop	1	2	3
Galleta	HIJA	10-20	---	---	5-15	---	---
Indian ricegrass	ORHY	2- 5	2- 5	---	5-10	5-10	2- 5
Needlegrass	STIPA	5-10	---	---	2-10	---	---
King desertgrass	BLKI	---	1- 2	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 2	---	1- 5	---	---
Bluegrass	POA++	---	---	---	2-10	---	---
Other perennial grasses	PPGG	5-10	1- 5	---	10-15	5-10	1- 3
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	2- 4	1- 3
Perennial forbs	PPFF	5-10	2- 5	---	5-10	2- 6	1- 4
Annual forbs	AAFF	2- 5	1- 5	---	1- 5	1- 5	1- 3
Nevada ephedra	EPNE	5-10	---	---	5-10	2- 5	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	2- 5	---	---
Spiny menodora	MESP2	10-25	---	---	---	---	---
Bailey greasebush	SAVEB	5-10	10-15	---	---	2-10	---
Anderson wolfberry	LYAN	5-10	---	---	---	---	---
Shadscale	ATCO	2- 5	40-60	---	---	---	---
Nevada dalea	DAPO2	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	2- 5	---
Black sagebrush	ARARN	---	---	---	15-20	---	1-10
Winterfat	EULA5	---	---	---	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Littleleaf mountainmahogany	CELEI2	---	---	---	---	---	50-75
Nevada greasebush	GLNE	---	---	---	---	---	10-20
Wyoming big sagebrush	ARTRW	---	---	---	---	---	1- 5
Other shrubs	SSSS	15-25	5-15	---	10-20	10-20	5-15
Range site number		029X037N	029X033N	None	029X014N	029X041N	029X040N
Potential production (lb/acre):							
Favorable years		300	100	---	500	500	350
Normal years		200	50	---	300	300	250
Unfavorable years		100	25	---	100	100	150

2031--Theriot-Eaglepass-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Theriot	Eaglepass	Rock outcrop	1	2	3	4
Galleta	HIJA	10-20	---	---	10-20	5-15	---	5-15
Indian ricegrass	ORHY	2- 5	2- 5	---	2- 5	5-10	5-10	5-10
Needlegrass	STIPA	5-10	---	---	5-10	2-10	---	2-10
Bluegrass	POA++	---	---	---	---	2-10	---	2-10
Bottlebrush squirreltail	SIHY	---	---	---	---	1- 5	---	1- 5
Other perennial grasses	PPGG	5-10	1- 3	---	5-10	10-15	5-10	10-15
Annual grasses	AAGG	1- 5	1- 3	---	1- 5	1- 5	2- 4	1- 5
Perennial forbs	PPFF	5-10	1- 4	---	5-10	5-10	2- 6	5-10
Annual forbs	AAFF	2- 5	1- 3	---	2- 5	1- 5	1- 5	1- 5
Nevada ephedra	EPNE	5-10	---	---	5-10	5-10	2- 5	5-10
Bud sagebrush	ARSP5	2- 5	---	---	2- 5	2- 5	---	2- 5
Spiny menodora	MESP2	10-25	---	---	10-25	---	---	---
Bailey greasewood	SAVEB	5-10	---	---	5-10	---	2-10	---
Anderson wolfberry	LYAN	5-10	---	---	5-10	---	---	---
Shadscale	ATCO	2- 5	---	---	2- 5	---	---	---
Littleleaf mountainmahogany	CELEI2	---	50-75	---	---	---	---	---
Nevada greasewood	GLNE	---	10-20	---	---	---	---	---
Black sagebrush	ARARN	---	1-10	---	---	15-20	---	15-20
Wyoming big sagebrush	ARTRW	---	1- 5	---	---	---	---	---
Winterfat	EULA5	---	---	---	---	2- 5	---	2- 5
Rubber rabbitbrush	CHNA2	---	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	---	---	2- 5	---
Other shrubs	SSSS	15-25	5-15	---	15-25	10-20	10-20	10-20

Range site number	029X037N	029X040N	None	029X037N	029X014N	029X041N	029X014N
Potential production (lb/acre):							
Favorable years	300	350	---	300	500	500	500
Normal years	200	250	---	200	300	300	300
Unfavorable years	100	150	---	100	100	100	100

## 2032--Theriot-Kyler-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Theriot	Kyler	Rock outcrop	1	2	3	4
Galleta	HIJA	10-20	5-15	---	---	---	10-20	5-15
Indian ricegrass	ORHY	2- 5	5-10	---	2- 5	---	2- 5	5-10
Needlegrass	STIPA	5-10	2-10	---	---	---	5-10	2-10
Bluegrass	POA++	---	2-10	---	---	---	---	2-10
Bottlebrush squirreltail	SIHY	---	1- 5	---	1- 2	---	---	1- 5
King desertgrass	BLKI	---	---	---	1- 2	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---	---
Other perennial grasses	PPGG	5-10	10-15	---	1- 5	10-25	5-10	10-15
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	---	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	---	2- 5	2- 5	5-10	5-10
Annual forbs	AAFF	2- 5	1- 5	---	1- 5	2- 5	2- 5	1- 5
Nevada ephedra	EPNE	5-10	5-10	---	---	---	5-10	5-10
Bud sagebrush	ARSP5	2- 5	2- 5	---	2- 5	---	2- 5	2- 5
Spiny menodora	MESP2	10-25	---	---	---	---	10-25	---
Bailey greasewood	SAVEB	5-10	---	---	10-15	---	5-10	---
Anderson wolfberry	LYAN	5-10	---	---	---	---	5-10	---
Shadscale	ATCO	2- 5	---	---	40-60	---	2- 5	---
Black sagebrush	ARARN	---	15-20	---	---	---	---	15-20
Winterfat	EULA5	---	2- 5	---	---	---	---	2- 5
Nevada dalea	DAPO2	---	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	---	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---	---
Rabbitbrush	CHRY59	---	---	---	---	10-30	---	---
Spiny hopsage	GRSP	---	---	---	---	10-20	---	---
Other shrubs	SSSS	15-25	10-20	---	5-15	5-15	15-25	10-20
Range site number		O29X037N	O29X014N	None	O29X033N	O27X029N	O29X037N	O29X014N
Potential production (lb/acre):								
Favorable years		300	500	---	100	800	300	500
Normal years		200	300	---	50	500	200	300
Unfavorable years		100	100	---	25	100	100	100

2080--Roic-Roic, dry, association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Roic	Roic, dry	1	2	3	4
Galleta	HIJA	10-25	---	5-20	10-25	5-20	5-20
Indian ricegrass	ORHY	5-10	2- 5	5-10	5-10	5-10	5-10
Bottlebrush squirreltail	SIHY	2- 5	1- 2	---	2- 5	---	---
Needlegrass	STIPA	2- 5	---	2- 5	2- 5	5-15	2- 5
Dropseed	SPORO	2- 5	---	5-15	2- 5	---	5-15
King desertgrass	BLKI	---	1- 2	---	---	---	---
Needleandthread	STCO4	---	---	---	---	---	---
Other perennial grasses	PPGG	5-15	1- 5	5-10	5-15	10-15	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	1- 5
Perennial forbs	PPFF	4-10	2- 5	5- 7	4-10	3- 8	5- 7
Annual forbs	AAFF	1- 5	1- 5	2- 4	1- 5	2- 5	2- 4
Shadscale	ATCO	10-25	40-60	---	10-25	---	---
Bailey greasewood	SAVEB	5-10	10-15	---	5-10	---	---
Bud sagebrush	ARSP5	5-10	2- 5	5-10	5-10	5-10	5-10
Winterfat	EULA5	5-10	---	5-20	5-10	2- 5	5-20
Nevada ephedra	EPNE	1- 5	---	---	1- 5	2- 5	---
Nevada dalea	DAPO2	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---	---
Fourwing saltbush	ATCA2	---	---	10-15	---	---	10-15
Spiny hopsage	GRSP	---	---	2- 8	---	---	2- 8
Anderson wolfberry	LYAN	---	---	1- 5	---	---	1- 5
Black sagebrush	ARARN	---	---	---	---	20-25	---
Hairy horsebrush	TECO2	---	---	---	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	---
Other shrubs	SSSS	10-20	5-15	10-25	10-20	10-20	10-25

Range site number	029X017N	029X033N	029X046N	029X017N	029X008N	029X046N
Potential production (lb/acre):						
Favorable years	350	100	450	350	700	450
Normal years	250	50	350	250	400	350
Unfavorable years	100	25	175	100	200	175

## 2081--Roic-Roic, dry-Badland association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Roic	Roic, dry	Badland	1	2	3	4
Galleta	HIJA	5-20	---	---	5-20	---	---	---
Indian ricegrass	ORHY	5-10	2- 5	---	5-10	5-10	2- 5	---
Dropseed	SPORO	5-15	---	---	5-15	---	---	---
Needlegrass	STIPA	2- 5	---	---	2- 5	---	---	---
King desertgrass	BLKI	---	1- 2	---	---	---	1- 2	---
Bottlebrush squirreltail	SIHY	---	1- 2	---	---	---	1- 2	---
Other perennial grasses	PPGG	5-10	1- 5	---	5-10	5-10	1- 5	---
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	2- 4	1- 5	---
Perennial forbs	PPFF	5- 7	2- 5	---	5- 7	2- 6	2- 5	---
Annual forbs	AAFF	2- 4	1- 5	---	2- 4	1- 5	1- 5	---
Fourwing saltbush	ATCA2	10-15	---	---	10-15	5-15	---	---
Winterfat	EULA5	5-20	---	---	5-20	---	---	---
Bud sagebrush	ARSP5	5-10	2- 5	---	5-10	---	2- 5	---
Spiny hopsage	GRSP	2- 8	---	---	2- 8	---	---	---
Anderson wolfberry	LYAN	1- 5	---	---	1- 5	---	---	---
Shadscale	ATCO	---	40-60	---	---	---	40-60	---
Bailey greasewood	SAVEB	---	10-15	---	---	2-10	10-15	---
Nevada dalea	DAPO2	---	5-10	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	2- 5	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---	---
Nevada ephedra	EPNE	---	---	---	---	2- 5	---	---
Other shrubs	SSSS	10-25	5-15	---	10-25	10-20	5-15	---
Range site number		029X046N	029X033N	None	029X046N	029X041N	029X033N	None
Potential production (lb/acre):								
Favorable years		450	100	---	450	500	100	---
Normal years		350	50	---	350	300	50	---
Unfavorable years		175	25	---	175	100	25	---

2082--Roic-Koyen association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Roic	Koyen	1	2	3	4
Galleta	HIJA	10-25	10-25	2- 5	5-20	---	5-20
Indian ricegrass	ORHY	5-10	5-10	2- 5	5-10	5-10	5-15
Bottlebrush squirreltail	SIHY	2- 5	2- 5	2- 5	---	---	1- 5
Needlegrass	STIPA	2- 5	2- 5	---	5-15	---	2-10
Dropseed	SPORO	2- 5	2- 5	---	---	---	5-10
Needleandthread	STCO4	---	---	---	---	---	---
Other perennial grasses	PPGG	5-15	5-15	2- 5	10-15	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	2- 4	1- 5
Perennial forbs	PPFF	4-10	4-10	2- 8	3- 8	2- 6	5-10
Annual forbs	AAFF	1- 5	1- 5	1- 2	2- 5	1- 5	1- 5
Shadscale	ATCO	10-25	10-25	2-10	---	---	---
Bailey greasewood	SAVEB	5-10	5-10	---	---	2-10	---
Bud sagebrush	ARSP5	5-10	5-10	---	5-10	---	10-15
Winterfat	EULA5	5-10	5-10	---	2- 5	---	20-30
Nevada ephedra	EPNE	1- 5	1- 5	5-15	2- 5	2- 5	1- 5
Black sagebrush	ARARN	---	---	5-15	20-25	---	---
Mexican cliffrose	COME5	---	---	2-10	---	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	2-10
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---
Hairy horsebrush	TECO2	---	---	---	---	---	---
Nevada dalea	DAPO2	---	---	---	---	---	---
Other shrubs	SSSS	10-20	10-20	5-15	10-20	10-20	10-15
Utah juniper	JUOS	---	---	2- 5	---	---	---

Range site number	029X017N	029X017N	027X066N	029X008N	029X041N	029X020N
Potential production (lb/acre):						
Favorable years	350	350	100	700	500	400
Normal years	250	250	75	400	300	250
Unfavorable years	100	100	50	200	100	100

2091--Geer-Veet association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Geer	Veet	1
Galleta	HIJA	5-20	5-25	---
Indian ricegrass	ORHY	5-15	5-15	---
Needlegrass	STIPA	2-10	5-15	---
Dropseed	SPORO	5-10	5-10	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	---
Sandberg bluegrass	POSE	---	---	2- 5
Basin wildrye	ELCI2	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-20	10-25
Annual grasses	AAGG	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	3-10	2- 5
Annual forbs	AAFF	1- 5	2- 5	2- 5
Winterfat	EULA5	20-30	2-10	---
Bud sagebrush	ARSP5	10-15	5-10	---
Fourwing saltbush	ATCA2	2-10	---	---
Nevada ephedra	EPNE	1- 5	---	---
Wyoming big sagebrush	ARTRW	---	15-20	---
Spiny hopsage	GRSP	---	5-10	10-20
Big sagebrush	ARTR2	---	---	10-30
Rabbitbrush	CHRYS9	---	---	10-30
Other shrubs	SSSS	10-15	10-20	5-15

Range site number	029X020N	029X049N	027X029N
Potential production (lb/acre):			
Favorable years	400	900	800
Normal years	250	600	500
Unfavorable years	100	300	100

2092--Geer fine sandy loam, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Geer	1
Galleta	HIJA	5-20	5-25
Indian ricegrass	ORHY	5-15	5-15
Needlegrass	STIPA	2-10	5-15
Dropseed	SPORO	5-10	5-10
Bottlebrush squirreltail	SIHY	1- 5	1- 5
Other perennial grasses	PPGG	5-10	5-20
Annual grasses	AAGG	1- 5	1- 5
Perennial forbs	PPFF	5-10	3-10
Annual forbs	AAFF	1- 5	2- 5
Winterfat	EULA5	20-30	2-10
Bud sagebrush	ARSP5	10-15	5-10
Fourwing saltbush	ATCA2	2-10	---
Nevada ephedra	EPNE	1- 5	---
Wyoming big sagebrush	ARTRW	---	15-20
Spiny hopsage	GRSP	---	5-10
Other shrubs	SSSS	10-15	10-20

Range site number	029X020N	029X049N
Potential production (lb/acre):		
Favorable years	400	900
Normal years	250	600
Unfavorable years	100	300

## 2100--Rodad-Theriot-Kyler association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Rodad	Theriot	Kyler	1	2	3
Galleta	HIJA	10-20	5-20	5-15	---	---	5-15
Indian ricegrass	ORHY	2- 5	5-15	5-10	---	2- 5	5-10
Needlegrass	STIPA	5-10	5-10	2-10	---	---	5-10
Bottlebrush squirreltail	SIHY	---	2- 5	1- 5	---	1- 2	1- 4
Bluegrass	POA++	---	---	2-10	---	---	---
King desertgrass	BLKI	---	---	---	---	1- 2	---
Other perennial grasses	PPGG	5-10	5-10	10-15	---	1- 5	5-20
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	5-10	---	2- 5	4-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	---	1- 5	2- 7
Nevada ephedra	EPNE	5-10	2- 5	5-10	---	---	5-10
Bud sagebrush	ARSP5	2- 5	2- 5	2- 5	---	2- 5	---
Spiny menodora	MESP2	10-25	---	---	---	---	---
Bailey greasewood	SAVEB	5-10	5-15	---	---	10-15	---
Anderson wolfberry	LYAN	5-10	---	---	---	---	---
Shadscale	ATCO	2- 5	15-25	---	---	40-60	---
Black sagebrush	ARARN	---	---	15-20	---	---	---
Winterfat	EULA5	---	---	2- 5	---	---	---
Nevada dalea	DAPO2	---	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	20-30
Other shrubs	SSSS	15-25	10-20	10-20	---	5-15	10-20
Range site number		029X037N	029X022N	029X014N	None	029X033N	029X010N
Potential production (lb/acre):							
Favorable years		300	300	500	---	100	600
Normal years		200	200	300	---	50	400
Unfavorable years		100	100	100	---	25	200

2101--Rodad-Penelas-Blacktop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Rodad	Penelas	Blacktop	1	2	3
Galleta	HIJA	10-20	5-15	---	---	5-10	---
Indian ricegrass	ORHY	2- 5	5-10	2- 5	---	5-20	5-10
Needlegrass	STIPA	5-10	2-10	---	---	---	---
Bluegrass	POA++	---	2-10	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	1- 2	---	---	---
King desertgrass	BLKI	---	---	1- 2	---	---	---
Other perennial grasses	PPGG	5-10	10-15	1- 5	---	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	2- 4
Perennial forbs	PPFF	5-10	5-10	2- 5	---	5-10	2- 6
Annual forbs	AAFF	2- 5	1- 5	1- 5	---	2- 5	1- 5
Nevada ephedra	EPNE	5-10	5-10	---	---	5-10	2- 5
Bud sagebrush	ARSP5	2- 5	2- 5	2- 5	---	5-10	---
Spiny menodora	MESP2	10-25	---	---	---	10-30	---
Bailey greasewood	SAVEB	5-10	---	10-15	---	5-15	2-10
Anderson wolfberry	LYAN	5-10	---	---	---	---	---
Shadscale	ATCO	2- 5	---	40-60	---	5-15	---
Black sagebrush	ARARN	---	15-20	---	---	---	---
Winterfat	EULA5	---	2- 5	---	---	---	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	2- 5
Rubber rabbitbrush	CHNA2	---	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	---	5-15
Burrobrush	HYMEN3	---	---	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-10
Other shrubs	SSSS	15-25	10-20	5-15	---	10-20	10-20

Range site number	029X037N	029X014N	029X033N	None	029X036N	029X041N
Potential production (lb/acre):						
Favorable years	300	500	100	---	400	500
Normal years	200	300	50	---	300	300
Unfavorable years	100	100	25	---	100	100

## 2110--Bylo Variant very fine sandy loam, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Bylo Variant	1	2
Indian ricegrass	ORHY	20-40	---	5-15
Bottlebrush squirreltail	SIHY	2- 5	---	1- 5
Galleta	HIJA	---	---	5-20
Needlegrass	STIPA	---	---	2-10
Dropseed	SPORO	---	---	5-10
Other perennial grasses	PPGG	5-10	---	5-10
Annual grasses	AAGG	---	---	1- 5
Perennial forbs	PPFF	5-10	---	5-10
Annual forbs	AAFF	---	---	1- 5
Winterfat	EULA5	40-60	---	20-30
Bud sagebrush	ARSP5	5-15	---	10-15
Fourwing saltbush	ATCA2	---	---	2-10
Nevada ephedra	EPNE	---	---	1- 5
Other shrubs	SSSS	5-10	---	10-15
Range site number		027X014N	None	029X020N
Potential production (lb/acre):				
Favorable years		600	---	400
Normal years		400	---	250
Unfavorable years		200	---	100

2120--Itme-Truhoy association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Itme	Truhoy	1	2	3
Galleta	HIJA	5-20	5-10	---	---	---
Indian ricegrass	ORHY	5-20	5-20	5-10	30-50	---
Dropseed	SPORO	2-10	---	---	---	---
Needleandthread	STCO4	---	---	---	2-10	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-15	5-10	5-10	2-10	10-25
Annual grasses	AAGG	2- 5	1- 5	2- 4	---	---
Perennial forbs	PPFF	5-10	5-10	2- 6	2- 5	2- 5
Annual forbs	AAFF	1- 5	2- 5	1- 5	2- 5	2- 5
Spiny hopsage	GRSP	10-20	---	---	---	10-20
Bud sagebrush	ARSP5	5-20	5-10	---	---	---
Anderson wolfberry	LYAN	5-15	---	---	---	---
Nevada dalea	DAPO2	2-10	---	---	2-10	---
Cooper wolfberry	LYCO2	2- 5	---	2- 5	---	---
Nevada ephedra	EPNE	2- 5	5-10	2- 5	---	---
Spiny menodora	MESP2	---	10-30	---	---	---
Bailey greasewood	SAVEB	---	5-15	2-10	---	---
Shadscale	ATCO	---	5-15	---	---	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	5-15	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Winterfat	EULA5	---	---	---	2-10	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	10-30
Other shrubs	SSSS	10-20	10-20	10-20	5-10	5-15

Range site number	029X016N	029X036N	029X041N	027X009N	027X029N
Potential production (lb/acre):					
Favorable years	400	400	500	800	800
Normal years	300	300	300	450	500
Unfavorable years	200	100	100	200	100

## 3000--Perazzo-Typic Torriorthents association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Perazzo	Typic Torriorthents	1	2	3	4
Indian ricegrass	ORHY	10-20	2- 5	10-20	10-20	5-10	---
Bottlebrush squirreltail	SIHY	5-10	1- 2	5-10	5-10	2-10	---
King desertgrass	BLKI	---	1- 2	---	---	---	---
Other perennial grasses	PPGG	5-10	1- 5	5-10	5-10	5-10	---
Annual grasses	AAGG	---	1- 5	---	---	---	---
Perennial forbs	PPFF	3- 7	2- 5	3- 7	3- 7	2- 5	---
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5	5-15	---
Shadscale	ATCO	15-30	40-60	15-30	15-30	---	---
Bailey greasewood	SAVEB	10-20	10-15	10-20	10-20	5-20	---
Bud sagebrush	ARSP5	5-15	2- 5	5-15	5-15	---	---
Nevada dalea	DAPO2	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-25	---
Rubber rabbitbrush	CHNA2	---	---	---	---	5-20	---
Spiny hopsage	GRSP	---	---	---	---	5-20	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Fourwing saltbush	ATCA2	---	---	---	---	5-10	---
Nevada ephedra	EPNE	---	---	---	---	2- 5	---
Black greasewood	SAVE4	---	---	---	---	2- 5	---
Other shrubs	SSSS	5-10	5-15	5-10	5-10	2- 5	---
Range site number		027X018N	029X033N	027X018N	027X018N	027X022N	None
Potential production (lb/acre):							
Favorable years		500	100	500	500	400	---
Normal years		300	50	300	300	200	---
Unfavorable years		100	25	100	100	50	---

3001--Perazzo-Rowe-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Perazzo	Rowe	Bluewing	1	2	3	4
Indian ricegrass	ORHY	10-20	10-20	5-10	30-50	5-20	5-20	---
Bottlebrush squirreltail	SIHY	5-10	5-10	2-10	---	---	---	---
Needleandthread	STCO4	---	---	---	2-10	---	---	---
Desert needlegrass	STSP3	---	---	---	---	2-10	2-10	---
Other perennial grasses	PPGG	5-10	5-10	5-10	2-10	2- 5	2- 5	---
Perennial forbs	PPFF	3- 7	3- 7	2- 5	2- 5	5-10	5-10	---
Annual forbs	AAFF	2- 5	2- 5	5-15	2- 5	---	---	---
Shadscale	ATCO	15-30	15-30	---	---	10-20	10-20	---
Bailey greasewood	SAVEB	10-20	10-20	5-20	---	5-15	5-15	---
Bud sagebrush	ARSP5	5-15	5-15	---	---	2-10	2-10	---
Littleleaf horsebrush	TEGL	---	---	5-25	---	---	---	---
Rubber rabbitbrush	CHNA2	---	---	5-20	---	---	---	---
Spiny hopsage	GRSP	---	---	5-20	---	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---	---
Fourwing saltbush	ATCA2	---	---	5-10	5-15	---	---	---
Nevada ephedra	EPNE	---	---	2- 5	---	2- 5	2- 5	---
Black greasewood	SAVE4	---	---	2- 5	---	---	---	---
Winterfat	EULA5	---	---	---	2-10	---	---	---
Nevada dalea	DAPO2	---	---	---	2-10	---	---	---
Other shrubs	SSSS	5-10	5-10	2- 5	5-10	5-10	5-10	---

Range site number	027X018N	027X018N	027X022N	027X009N	027X027N	027X027N	None
Potential production (lb/acre):							
Favorable years	500	500	400	800	200	200	---
Normal years	300	300	200	450	100	100	---
Unfavorable years	100	100	50	200	50	50	---

3002--Perazzo-Veet-Rawe association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Perazzo	Veet	Rawe	1	2	3
Indian ricegrass	ORHY	10-20	5-15	10-20	5-20	---	---
Bottlebrush squirreltail	SIHY	5-10	1- 5	5-10	---	---	---
Galleta	HIJA	---	5-25	---	---	---	---
Needlegrass	STIPA	---	5-15	---	---	---	---
Dropseed	SPORO	---	5-10	---	---	---	---
Desert needlegrass	STSP3	---	---	---	2-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	5-10	5-20	5-10	2- 5	10-25	---
Annual grasses	AAGG	---	1- 5	---	---	---	---
Perennial forbs	PPFF	3- 7	3-10	3- 7	5-10	2- 5	---
Annual forbs	AAFF	2- 5	2- 5	2- 5	---	2- 5	---
Shadscale	ATCO	15-30	---	15-30	10-20	---	---
Bailey greasewood	SAVEB	10-20	---	10-20	5-15	---	---
Bud sagebrush	ARSP5	5-15	5-10	5-15	2-10	---	---
Wyoming big sagebrush	ARTRW	---	15-20	---	---	---	---
Spiny hopsage	GRSP	---	5-10	---	---	10-20	---
Winterfat	EULA5	---	2-10	---	---	---	---
Nevada ephedra	EPNE	---	---	---	2- 5	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	---	---	10-30	---
Other shrubs	SSSS	5-10	10-20	5-10	5-10	5-15	---
Range site number		027X018N	029X049N	027X018N	027X027N	027X029N	None
Potential production (lb/acre):							
Favorable years		500	900	500	200	800	---
Normal years		300	600	300	100	500	---
Unfavorable years		100	300	100	50	100	---

3003--Perazzo-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Perazzo	Bluewing	1	2	3
Indian ricegrass	ORHY	10-20	5-10	10-20	5-15	30-50
Bottlebrush squirreltail	SIHY	5-10	2-10	5-10	2-10	---
Desert needlegrass	STSP3	---	---	---	5-15	---
Needleandthread	STCO4	---	---	---	---	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	2-10
Perennial forbs	PPFF	3- 7	2- 5	3- 7	5-10	2- 5
Annual forbs	AAFF	2- 5	5-15	2- 5	---	2- 5
Shadscale	ATCO	15-30	---	15-30	10-20	---
Bailey greasewood	SAVEB	10-20	5-20	10-20	5-10	---
Bud sagebrush	ARSP5	5-15	---	5-15	5-10	---
Littleleaf horsebrush	TEGL	---	5-25	---	---	---
Rubber rabbitbrush	CHNA2	---	5-20	---	---	---
Spiny hopsage	GRSP	---	5-20	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---
Fourwing saltbush	ATCA2	---	5-10	---	---	5-15
Nevada ephedra	EPNE	---	2- 5	---	---	---
Black greasewood	SAVE4	---	2- 5	---	---	---
Winterfat	EULA5	---	---	---	2- 5	2-10
Nevada dalea	DAPO2	---	---	---	---	2-10
Other shrubs	SSSS	5-10	2- 5	5-10	2- 5	5-10

Range site number	027X018N	027X022N	027X018N	027X019N	027X009N
Potential production (lb/acre):					
Favorable years	500	400	500	350	800
Normal years	300	200	300	200	450
Unfavorable years	100	50	100	50	200

## 3020--Rawe-Bluewing-Trocken association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Rawe	Bluewing	Trocken	1	2
Indian ricegrass	ORHY	10-20	10-20	10-20	10-20	5-10
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	5-10	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	3- 7	3- 7	3- 7	3- 7	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	5-15
Shadscale	ATCO	15-30	15-30	15-30	15-30	---
Bailey greasewood	SAVEB	10-20	10-20	10-20	10-20	5-20
Bud sagebrush	ARSP5	5-15	5-15	5-15	5-15	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-25
Rubber rabbitbrush	CHNA2	---	---	---	---	5-20
Spiny hopsage	GRSP	---	---	---	---	5-20
Burrobrush	HYMEN3	---	---	---	---	5-10
Fourwing saltbush	ATCA2	---	---	---	---	5-10
Nevada ephedra	EPNE	---	---	---	---	2- 5
Black greasewood	SAVE4	---	---	---	---	2- 5
Other shrubs	SSSS	5-10	5-10	5-10	5-10	2- 5
Range site number		027X018N	027X018N	027X018N	027X018N	027X022N
Potential production (lb/acre):						
Favorable years		500	500	500	500	400
Normal years		300	300	300	300	200
Unfavorable years		100	100	100	100	50

3040--Deefan-Rawe-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Deefan	Rawe	Bluewing	1	2	3
Indian ricegrass	ORHY	10-20	10-20	5-10	10-20	10-20	10-20
Bottlebrush squirreltail	SIHY	5-10	5-10	2-10	5-10	5-10	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	3- 7	3- 7	2- 5	3- 7	3- 7	3- 7
Annual forbs	AAFF	2- 5	2- 5	5-15	2- 5	2- 5	2- 5
Shadscale	ATCO	15-30	15-30	---	15-30	15-30	15-30
Bailey greasewood	SAVEB	10-20	10-20	5-20	10-20	10-20	10-20
Bud sagebrush	ARSP5	5-15	5-15	---	5-15	5-15	5-15
Littleleaf horsebrush	TEGL	---	---	5-25	---	---	---
Rubber rabbitbrush	CHNA2	---	---	5-20	---	---	---
Spiny hopsage	GRSP	---	---	5-20	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Fourwing saltbush	ATCA2	---	---	5-10	---	---	---
Nevada ephedra	EPNE	---	---	2- 5	---	---	---
Black greasewood	SAVE4	---	---	2- 5	---	---	---
Other shrubs	SSSS	5-10	5-10	2- 5	5-10	5-10	5-10
Range site number		027X018N	027X018N	027X022N	027X018N	027X018N	027X018N
Potential production (lb/acre):							
Favorable years		500	500	400	500	500	500
Normal years		300	300	200	300	300	300
Unfavorable years		100	100	50	100	100	100

3042--Deefan-Perazzo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Deefan	Perazzo	1	2	3
Indian ricegrass	ORHY	10-20	10-20	5-10	5-15	10-20
Bottlebrush squirreltail	SIHY	5-10	5-10	2-10	2-10	5-10
Desert needlegrass	STSP3	---	---	---	5-15	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10
Perennial forbs	PPFF	3- 7	3- 7	2- 5	5-10	3- 7
Annual forbs	AAFF	2- 5	2- 5	5-15	---	2- 5
Shadscale	ATCO	15-30	15-30	---	10-20	15-30
Bailey greasewood	SAVEB	10-20	10-20	5-20	5-10	10-20
Bud sagebrush	ARSP5	5-15	5-15	---	5-10	5-15
Littleleaf horsebrush	TEGL	---	---	5-25	---	---
Rubber rabbitbrush	CHNA2	---	---	5-20	---	---
Spiny hopsage	GRSP	---	---	5-20	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Fourwing saltbush	ATCA2	---	---	5-10	---	---
Nevada ephedra	EPNE	---	---	2- 5	---	---
Black greasewood	SAVE4	---	---	2- 5	---	---
Winterfat	EULA5	---	---	---	2- 5	---
Other shrubs	SSSS	5-10	5-10	2- 5	2- 5	5-10
Range site number		027X018N	027X018N	027X022N	027X019N	027X018N
Potential production (lb/acre):						
Favorable years		500	500	400	350	500
Normal years		300	300	200	200	300
Unfavorable years		100	100	50	50	100

3043--Deefan-Cleaver-Bluewing association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Deefan	Cleaver	Bluewing	1	2	3
Indian ricegrass	ORHY	10-20	10-20	5-10	10-20	10-20	30-50
Bottlebrush squirreltail	SIHY	5-10	5-10	2-10	5-10	5-10	---
Needleandthread	STCO4	---	---	---	---	---	2-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	2-10
Perennial forbs	PPFF	3- 7	3- 7	2- 5	3- 7	3- 7	2- 5
Annual forbs	AAFF	2- 5	2- 5	5-15	2- 5	2- 5	2- 5
Shadscale	ATCO	15-30	15-30	---	15-30	15-30	---
Bailey greasewood	SAVEB	10-20	10-20	5-20	10-20	10-20	---
Bud sagebrush	ARSP5	5-15	5-15	---	5-15	5-15	---
Littleleaf horsebrush	TEGL	---	---	5-25	---	---	---
Rubber rabbitbrush	CHNA2	---	---	5-20	---	---	---
Spiny hopsage	GRSP	---	---	5-20	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Fourwing saltbush	ATCA2	---	---	5-10	---	---	5-15
Nevada ephedra	EPNE	---	---	2- 5	---	---	---
Black greasewood	SAVE4	---	---	2- 5	---	---	---
Winterfat	EULA5	---	---	---	---	---	2-10
Nevada dalea	DAPO2	---	---	---	---	---	2-10
Other shrubs	SSSS	5-10	5-10	2- 5	5-10	5-10	5-10
Range site number		027X018N	027X018N	027X022N	027X018N	027X018N	027X009N
Potential production (lb/acre):							
Favorable years		500	500	400	500	500	800
Normal years		300	300	200	300	300	450
Unfavorable years		100	100	50	100	100	200

## 3052--Veet-Itme association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Veet	Itme	1	2
Galleta	HIJA	5-25	5-20	5-25	5-25
Indian ricegrass	ORHY	5-15	5-20	5-15	5-15
Needlegrass	STIPA	5-15	---	5-15	5-15
Dropseed	SPORO	5-10	2-10	5-10	5-10
Bottlebrush squirreltail	SIHY	1- 5	---	1- 5	1- 5
Other perennial grasses	PPGG	5-20	5-15	5-20	5-20
Annual grasses	AAGG	1- 5	2- 5	1- 5	1- 5
Perennial forbs	PPFF	3-10	5-10	3-10	3-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	---	15-20	15-20
Spiny hopsage	GRSP	5-10	10-20	5-10	5-10
Bud sagebrush	ARSP5	5-10	5-20	5-10	5-10
Winterfat	EULA5	2-10	---	2-10	2-10
Anderson wolfberry	LYAN	---	5-15	---	---
Nevada dalea	DAPO2	---	2-10	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---
Nevada ephedra	EPNE	---	2- 5	---	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20
Range site number		029X049N	029X016N	029X049N	029X049N
Potential production (lb/acre):					
Favorable years		900	400	900	900
Normal years		600	300	600	600
Unfavorable years		300	200	300	300

3054--Veet gravelly sandy loam, 4 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Veet	1	2	3
Galleta	HIJA	5-25	5-20	5-25	2- 5
Indian ricegrass	ORHY	5-15	5-15	5-15	2- 5
Needlegrass	STIPA	5-15	2-10	5-15	---
Dropseed	SPORO	5-10	5-10	5-10	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5	2- 5
Other perennial grasses	PPGG	5-20	5-10	5-20	2- 5
Annual grasses	AAGG	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	3-10	5-10	3-10	2- 8
Annual forbs	AAFF	2- 5	1- 5	2- 5	1- 2
Wyoming big sagebrush	ARTRW	15-20	---	15-20	---
Spiny hopsage	GRSP	5-10	---	5-10	---
Bud sagebrush	ARSP5	5-10	10-15	5-10	---
Winterfat	EULA5	2-10	20-30	2-10	---
Fourwing saltbush	ATCA2	---	2-10	---	---
Nevada ephedra	EPNE	---	1- 5	---	5-15
Black sagebrush	ARARN	---	---	---	5-15
Mexican cliffrose	COMES	---	---	---	2-10
Shadscale	ATCO	---	---	---	2-10
Other shrubs	SSSS	10-20	10-15	10-20	5-15
Utah juniper	JUOS	---	---	---	2- 5

Range site number	029X049N	029X020N	029X049N	027X066N
Potential production (lb/acre):				
Favorable years	900	400	900	100
Normal years	600	250	600	75
Unfavorable years	300	100	300	50

## 3060--Smedley-Silverbow-Annaw association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Smedley	Silverbow	Annaw	1	2
Galleta	HIJA	30-50	10-25	10-25	---	5-25
Indian ricegrass	ORHY	5-15	5-10	5-10	5-10	5-15
Bottlebrush squirreltail	SIHY	---	2- 5	2- 5	---	1- 5
Needlegrass	STIPA	---	2- 5	2- 5	---	5-15
Dropseed	SPORO	---	2- 5	2- 5	---	5-10
Other perennial grasses	PPGG	5-15	5-15	5-15	5-10	5-20
Annual grasses	AAGG	---	1- 5	1- 5	2- 4	1- 5
Perennial forbs	PPFF	5-10	4-10	4-10	2- 6	3-10
Annual forbs	AAFF	---	1- 5	1- 5	1- 5	2- 5
Shadscale	ATCO	5-15	10-25	10-25	---	---
Bailey greasewood	SAVEB	5-10	5-10	5-10	2-10	---
Bud sagebrush	ARSP5	---	5-10	5-10	---	5-10
Winterfat	EULA5	---	5-10	5-10	---	2-10
Nevada ephedra	EPNE	---	1- 5	1- 5	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	---
Wyoming big sagebrush	ARTRW	---	---	---	---	15-20
Spiny hopsage	GRSP	---	---	---	---	5-10
Other shrubs	SSSS	5-15	10-20	10-20	10-20	10-20
Range site number		027X015N	029X017N	029X017N	029X041N	029X049N
Potential production (lb/acre):						
Favorable years		500	350	350	500	900
Normal years		350	250	250	300	600
Unfavorable years		200	100	100	100	300

3061--Smedley-Annaw-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Smedley	Annaw	Izo	1	2
Galleta	HIJA	30-50	10-25	---	10-25	5-25
Indian ricegrass	ORHY	5-15	5-10	5-10	5-10	5-15
Bottlebrush squirreltail	SIHY	---	2- 5	---	2- 5	1- 5
Needlegrass	STIPA	---	2- 5	---	2- 5	5-15
Dropseed	SPORO	---	2- 5	---	2- 5	5-10
Other perennial grasses	PPGG	5-15	5-15	5-10	5-15	5-20
Annual grasses	AAGG	---	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	4-10	2- 6	4-10	3-10
Annual forbs	AAFF	---	1- 5	1- 5	1- 5	2- 5
Shadscale	ATCO	5-15	10-25	---	10-25	---
Bailey greasewood	SAVEB	5-10	5-10	2-10	5-10	---
Bud sagebrush	ARSP5	---	5-10	---	5-10	5-10
Winterfat	EULA5	---	5-10	---	5-10	2-10
Nevada ephedra	EPNE	---	1- 5	2- 5	1- 5	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	15-20
Spiny hopsage	GRSP	---	---	---	---	5-10
Other shrubs	SSSS	5-15	10-20	10-20	10-20	10-20

Range site number	027X015N	029X017N	029X041N	029X017N	029X049N
Potential production (lb/acre):					
Favorable years	500	350	500	350	900
Normal years	350	250	300	250	600
Unfavorable years	200	100	100	100	300

## 3063--Smedley very gravelly sandy loam, 4 to 30 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Smedley	1	2
Galleta	HIJA	30-50	---	10-25
Indian ricegrass	ORHY	5-15	5-10	5-10
Bottlebrush squirreltail	SIHY	---	---	2- 5
Needlegrass	STIPA	---	---	2- 5
Dropseed	SPORO	---	---	2- 5
Other perennial grasses	PPGG	5-15	5-10	5-15
Annual grasses	AAGG	---	2- 4	1- 5
Perennial forbs	PPFF	5-10	2- 6	4-10
Annual forbs	AAFF	---	1- 5	1- 5
Shadscale	ATCO	5-15	---	10-25
Bailey greasewood	SAVEB	5-10	2-10	5-10
Rubber rabbitbrush	CHNA2	---	10-25	---
Fourwing saltbush	ATCA2	---	5-15	---
Burrobrush	HYMEN3	---	5-10	---
Littleleaf horsebrush	TEGL	---	5-10	---
Nevada ephedra	EPNE	---	2- 5	1- 5
Cooper wolfberry	LYCO2	---	2- 5	---
Bud sagebrush	ARSP5	---	---	5-10
Winterfat	EULA5	---	---	5-10
Other shrubs	SSSS	5-15	10-20	10-20
Range site number		027X015N	029X041N	029X017N
Potential production (lb/acre):				
Favorable years		500	500	350
Normal years		350	300	250
Unfavorable years		200	100	100

3070--Silverbow-Rubble land-Smedley association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Silverbow	Rubble land	Smedley	1	2	3
Galleta	HIJA	10-25	---	30-50	---	15-25	---
Indian ricegrass	ORHY	5-10	---	5-15	---	5-10	---
Bottlebrush squirreltail	SIHY	2- 5	---	---	---	---	---
Needlegrass	STIPA	2- 5	---	---	---	---	5-15
Dropseed	SPORO	2- 5	---	---	---	---	---
Pine bluegrass	POSC	---	---	---	10-20	---	20-30
Thurber needlegrass	STH2	---	---	---	5-15	---	---
Sandberg bluegrass	POSE	---	---	---	5-10	---	---
Needleandthread	STCO4	---	---	---	---	5-10	---
Other perennial grasses	PPGG	5-15	---	5-15	5-10	2-10	5-15
Annual grasses	AAGG	1- 5	---	---	---	---	---
Perennial forbs	PPFF	4-10	---	5-10	5-10	5-10	5-10
Annual forbs	AAFF	1- 5	---	---	---	---	---
Shadscale	ATCO	10-25	---	5-15	---	---	---
Bailey greasewood	SAVEB	5-10	---	5-10	---	---	---
Bud sagebrush	ARSP5	5-10	---	---	---	---	---
Winterfat	EULA5	5-10	---	---	---	---	---
Nevada ephedra	EPNE	1- 5	---	---	---	2- 5	5-10
Low sagebrush	ARAR8	---	---	---	25-35	20-30	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	10-20
Spiny hopsage	GRSP	---	---	---	---	---	5-15
Other shrubs	SSSS	10-20	---	5-15	5-10	5-15	5-10
Range site number		029X017N	None	027X015N	027X020N	027X049N	027X007N
Potential production (lb/acre):							
Favorable years		350	---	500	400	500	600
Normal years		250	---	350	200	350	450
Unfavorable years		100	---	200	100	200	300

## 3090--Inmo-Inmo, occasionally flooded, association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Inmo	Inmo, occasionally flooded	1	2
Indian ricegrass	ORHY	10-20	5-10	10-20	10-20
Bottlebrush squirreltail	SIHY	5-10	---	5-10	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Annual grasses	AAGG	---	2- 4	---	---
Perennial forbs	PPFF	3- 7	2- 6	3- 7	3- 7
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5
Shadscale	ATCO	15-30	---	15-30	15-30
Bailey greasewood	SAVEB	10-20	2-10	10-20	10-20
Bud sagebrush	ARSP5	5-15	---	5-15	5-15
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Nevada ephedra	EPNE	---	2- 5	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---
Other shrubs	SSSS	5-10	10-20	5-10	5-10
Range site number		027X018N	029X041N	027X018N	027X018N
Potential production (lb/acre):					
Favorable years		500	500	500	500
Normal years		300	300	300	300
Unfavorable years		100	100	100	100

3091--Inmo-Rednik association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Inmo	Rednik	1	2	3
Indian ricegrass	ORHY	5-10	10-20	5-10	2- 5	---
Bottlebrush squirreltail	SIHY	---	5-10	2- 5	---	---
Desert needlegrass	STSP3	---	---	20-30	20-30	X
Sandberg bluegrass	POSE	---	---	2- 5	---	---
Galleta	HIJA	---	---	---	5-10	---
Inland saltgrass	DIST	---	---	---	---	X
Sedge	CAREX	---	---	---	---	X
Alkali muhly	MUAS	---	---	---	---	X
Other perennial grasses	PPGG	5-10	5-10	2- 5	2- 5	---
Annual grasses	AAGG	2- 4	---	---	---	---
Perennial forbs	PPFF	2- 6	3- 7	5-10	2- 5	---
Annual forbs	AAFF	1- 5	2- 5	---	---	---
Rubber rabbitbrush	CHNA2	10-25	---	---	---	---
Fourwing saltbush	ATCA2	5-15	---	---	---	X
Burrobrush	HYMEN3	5-10	---	---	5-10	X
Littleleaf horsebrush	TEGL	5-10	---	10-20	10-15	---
Bailey greasewood	SAVEB	2-10	10-20	---	---	---
Nevada ephedra	EPNE	2- 5	---	---	5-10	X
Cooper wolfberry	LYCO2	2- 5	---	---	---	X
Shadscale	ATCO	---	15-30	5-15	2- 5	---
Bud sagebrush	ARSP5	---	5-15	---	---	---
Anderson wolfberry	LYAN	---	---	---	10-20	---
Knapp brickellbush	BRKN	---	---	---	---	X
Other shrubs	SSSS	10-20	5-10	5-15	5-10	---

Range site number	029X041N	027X018N	027X017N	027X047N	Variable
Potential production (lb/acre):					
Favorable years	500	500	400	400	500
Normal years	300	300	200	200	300
Unfavorable years	100	100	100	100	100



3095--Inmo-Stumble association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Inmo	Stumble	1
Indian ricegrass	ORHY	5-10	30-50	5-10
Needleandthread	STCO4	---	2-10	---
Other perennial grasses	PPGG	5-10	2-10	5-10
Annual grasses	AAGG	2- 4	---	2- 4
Perennial forbs	PPFF	2- 6	2- 5	2- 6
Annual forbs	AAFF	1- 5	2- 5	1- 5
Rubber rabbitbrush	CHNA2	10-25	---	10-25
Fourwing saltbush	ATCA2	5-15	5-15	5-15
Burrobrush	HYMEN3	5-10	---	5-10
Littleleaf horsebrush	TEGL	5-10	---	5-10
Bailey greasewood	SAVEB	2-10	---	2-10
Nevada ephedra	EPNE	2- 5	---	2- 5
Cooper wolfberry	LYCO2	2- 5	---	2- 5
Winterfat	EULA5	---	2-10	---
Nevada dalea	DAPO2	---	2-10	---
Other shrubs	SSSS	10-20	5-10	10-20

Range site number	029X041N	027X009N	029X041N
Potential production (lb/acre):			
Favorable years	500	800	500
Normal years	300	450	300
Unfavorable years	100	200	100

3110--Fulstone-Wedlar-Veet association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Fulstone	Wedlar	Veet	1	2	3
Thurber needlegrass	STH2	20-40	---	---	---	---	---
Bottlebrush squirreltail	SIHY	5-10	1- 5	1- 5	---	5-10	---
Bluegrass	POA++	5-15	---	---	---	---	---
Indian ricegrass	ORHY	5-10	5-10	5-15	5-10	5-10	---
Galleta	HIJA	---	5-15	5-25	15-25	---	---
Needlegrass	STIPA	---	2-10	5-15	---	---	---
Dropseed	SPORO	---	---	5-10	---	---	---
Needleandthread	STCO4	---	---	---	5-10	---	---
Desert needlegrass	STSP3	---	---	---	---	10-15	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	10-20	5-20	2-10	2- 5	10-25
Annual grasses	AAGG	---	1- 5	1- 5	---	---	---
Perennial forbs	PPFF	5-10	5-10	3-10	5-10	5-10	2- 5
Annual forbs	AAFF	---	2- 5	2- 5	---	---	2- 5
Low sagebrush	ARAR8	10-20	---	---	20-30	---	---
Littleleaf horsebrush	TEGL	2- 5	---	---	---	---	---
Wyoming big sagebrush	ARTRW	---	15-20	15-20	---	15-20	---
Fourwing saltbush	ATCA2	---	5-10	---	---	---	---
Nevada ephedra	EPNE	---	2- 5	---	2- 5	---	---
Winterfat	EULA5	---	2- 5	2-10	---	---	---
Spiny hopsage	GRSP	---	2- 5	5-10	---	---	10-20
Bud sagebrush	ARSP5	---	---	5-10	---	---	---
Douglas rabbitbrush	CHV18	---	---	---	---	5-10	---
Purple sage	SACA9	---	---	---	---	5-10	---
Antelope bitterbrush	PUTR2	---	---	---	---	5-10	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	10-30
Other shrubs	SSSS	5-10	10-25	10-20	5-15	2- 5	5-15
Utah juniper	JUOS	---	---	---	---	2- 5	---

Range site number	026X025N	029X006N	029X049N	027X049N	026X029N	027X029N
Potential production (lb/acre):						
Favorable years	400	800	900	500	200	800
Normal years	300	500	600	350	150	500
Unfavorable years	200	300	300	200	100	100

3111--Fulstone-Mickey association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Fulstone	Mickey	1	2	3
Thurber needlegrass	STTH2	20-40	---	---	---	---
Bottlebrush squirreltail	SIHY	5-10	---	---	1- 5	X
Bluegrass	POA++	5-15	---	---	---	---
Indian ricegrass	ORHY	5-10	5-10	---	5-15	X
Galleta	HIJA	---	15-25	---	5-25	---
Needleandthread	STCO4	---	5-10	---	---	---
Sandberg bluegrass	POSE	---	---	2- 5	---	---
Basin wildrye	ELC12	---	---	2- 5	---	---
Needlegrass	STIPA	---	---	---	5-15	---
Dropseed	SPORO	---	---	---	5-10	---
Western needlegrass	STOC2	---	---	---	---	X
Pine bluegrass	POSC	---	---	---	---	X
Other perennial grasses	PPGG	5-10	2-10	10-25	5-20	X
Annual grasses	AAGG	---	---	---	1- 5	---
Perennial forbs	PPFF	5-10	5-10	2- 5	3-10	X
Annual forbs	AAFF	---	---	2- 5	2- 5	---
Low sagebrush	ARAR8	10-20	20-30	---	---	---
Littleleaf horsebrush	TEGL	2- 5	---	---	---	---
Nevada ephedra	EPNE	---	2- 5	---	---	---
Big sagebrush	ARTR2	---	---	10-30	---	---
Rabbitbrush	CHRYS9	---	---	10-30	---	---
Spiny hopsage	GRSP	---	---	10-20	5-10	---
Wyoming big sagebrush	ARTRW	---	---	---	15-20	---
Bud sagebrush	ARSP5	---	---	---	5-10	---
Winterfat	EULA5	---	---	---	2-10	---
Mountain big sagebrush	ARTRV	---	---	---	---	X
Antelope bitterbrush	PUTR2	---	---	---	---	X
Green ephedra	EPVI	---	---	---	---	X
Other shrubs	SSSS	5-10	5-15	5-15	10-20	X
Singleleaf pinyon	PIMO	---	---	---	---	X
Utah juniper	JUOS	---	---	---	---	X
Range site number		026X025N	027X049N	027X029N	029X049N	026X060N
Potential production (lb/acre):						
Favorable years		400	500	800	900	300
Normal years		300	350	500	600	225
Unfavorable years		200	200	100	300	150

3120--Wassit-Brawley association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Wassit	Brawley	1	2	3	4
Western needlegrass	STOC2	X	X	X	---	---	---
Pine bluegrass	POSC	X	X	X	---	---	10-20
Indian ricegrass	ORHY	X	X	X	---	X	---
Bottlebrush squirreltail	SIHY	X	X	X	---	X	---
Thurber needlegrass	STTH2	---	---	---	---	---	5-15
Sandberg bluegrass	POSE	---	---	---	---	---	5-10
Other perennial grasses	PPGG	X	X	X	---	X	5-10
Perennial forbs	PPFF	X	X	X	---	X	5-10
Mountain big sagebrush	ARTRV	X	X	X	---	---	---
Antelope bitterbrush	PUTR2	X	X	X	---	---	---
Green ephedra	EPVI	X	X	X	---	X	---
Black sagebrush	ARARN	---	---	---	---	X	---
Wyoming big sagebrush	ARTRW	---	---	---	---	X	---
Nevada ephedra	EPNE	---	---	---	---	X	---
Low sagebrush	ARAR8	---	---	---	---	---	25-35
Other shrubs	SSSS	X	X	X	---	X	5-10
Singleleaf pinyon	PIMO	X	X	X	---	X	---
Utah juniper	JUOS	X	X	X	---	X	---

Range site number	026X060N	026X060N	026X060N	None	029X081N	027X020N
Potential production (lb/acre):						
Favorable years	300	300	300	---	125	400
Normal years	225	225	225	---	75	200
Unfavorable years	150	150	150	---	25	100

3123--Wassit very stony sandy loam, 15 to 50 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Wassit	1	2	3
Western needlegrass	STOC2	X	---	---	---
Pine bluegrass	POSC	X	---	---	---
Indian ricegrass	ORHY	X	---	---	10-20
Bottlebrush squirreltail	SIHY	X	---	---	2- 5
Letterman needlegrass	STLE4	---	---	10-25	---
Bluegrass	POA++	---	---	5-10	---
Prairie junegrass	KOCR	---	---	2- 5	---
Wheatgrass	AGROP2	---	---	---	2- 5
Needleandthread	STCO4	---	---	---	10-30
Other perennial grasses	PPGG	X	---	10-15	5-10
Perennial forbs	PPFF	X	---	5-15	2- 5
Annual forbs	AAFF	---	---	---	2- 5
Mountain big sagebrush	ARTRV	X	---	---	---
Antelope bitterbrush	PUTR2	X	---	---	---
Green ephedra	EPVI	X	---	---	---
Low sagebrush	ARAR8	---	---	20-30	---
Big sagebrush	ARTR2	---	---	---	10-20
Spiny hopsage	GRSP	---	---	---	5-10
Other shrubs	SSSS	X	---	5-15	5-10
Singleleaf pinyon	PIMO	X	---	---	---
Utah juniper	JUOS	X	---	---	---
Range site number		026X060N	None	026X028N	027X045N
Potential production (lb/acre):					
Favorable years		300	---	350	700
Normal years		225	---	250	500
Unfavorable years		150	---	150	400

3124--Wassit-Loomer association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Wassit	Loomer	1	2
Western needlegrass	STOC2	X	---	---	---
Pine bluegrass	POSC	X	10-20	---	---
Indian ricegrass	ORHY	X	---	X	---
Bottlebrush squirreltail	SIHY	X	---	X	---
Thurber needlegrass	STTH2	---	5-15	---	---
Sandberg bluegrass	POSE	---	5-10	---	---
Letterman needlegrass	STLE4	---	---	---	10-25
Bluegrass	POA++	---	---	---	5-10
Prairie junegrass	KOCR	---	---	---	2- 5
Other perennial grasses	PPGG	X	5-10	X	10-15
Perennial forbs	PPFF	X	5-10	X	5-15
Mountain big sagebrush	ARTRV	X	---	---	---
Antelope bitterbrush	PUTR2	X	---	---	---
Green ephedra	EPVI	X	---	X	---
Low sagebrush	ARAR8	---	25-35	---	20-30
Black sagebrush	ARARN	---	---	X	---
Wyoming big sagebrush	ARTRW	---	---	X	---
Nevada ephedra	EPNE	---	---	X	---
Other shrubs	SSSS	X	5-10	X	5-15
Singleleaf pinyon	PIMO	X	---	X	---
Utah juniper	JUOS	X	---	X	---
Range site number		026X060N	027X020N	029X081N	026X028N
Potential production (lb/acre):					
Favorable years		300	400	125	350
Normal years		225	200	75	250
Unfavorable years		150	100	25	150

3130--Mickey-Smedley-Veet association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Mickey	Smedley	Veet	1	2	3	4
Galleta	HIJA	15-25	30-50	5-25	---	10-25	15-25	15-25
Indian ricegrass	ORHY	5-10	5-15	5-15	---	5-10	5-10	5-10
Needleandthread	STCO4	5-10	---	---	---	---	5-10	5-10
Needlegrass	STIPA	---	---	5-15	---	2- 5	---	---
Dropseed	SPORO	---	---	5-10	---	2- 5	---	---
Bottlebrush squirreltail	SIHY	---	---	1- 5	---	2- 5	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---	---	---
Basin wildrye	ELCI2	---	---	---	2- 5	---	---	---
Other perennial grasses	PPGG	2-10	5-15	5-20	10-25	5-15	2-10	2-10
Annual grasses	AAGG	---	---	1- 5	---	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	3-10	2- 5	4-10	5-10	5-10
Annual forbs	AAFF	---	---	2- 5	2- 5	1- 5	---	---
Low sagebrush	ARAR8	20-30	---	---	---	---	20-30	20-30
Nevada ephedra	EPNE	2- 5	---	---	---	1- 5	2- 5	2- 5
Shadscale	ATCO	---	5-15	---	---	10-25	---	---
Bailey greasewood	SAVEB	---	5-10	---	---	5-10	---	---
Wyoming big sagebrush	ARTRW	---	---	15-20	---	---	---	---
Spiny hopsage	GRSP	---	---	5-10	10-20	---	---	---
Bud sagebrush	ARSP5	---	---	5-10	---	5-10	---	---
Winterfat	EULA5	---	---	2-10	---	5-10	---	---
Big sagebrush	ARTR2	---	---	---	10-30	---	---	---
Rabbitbrush	CHRY9	---	---	---	10-30	---	---	---
Other shrubs	SSSS	5-15	5-15	10-20	5-15	10-20	5-15	5-15

Range site number	027X049N	027X015N	029X049N	027X029N	029X017N	027X049N	027X049N
Potential production (lb/acre):							
Favorable years	500	500	900	800	350	500	500
Normal years	350	350	600	500	250	350	350
Unfavorable years	200	200	300	100	100	200	200

## 3131--Mickey-Veet association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Mickey	Veet	1	2	3
Galleta	HIJA	15-25	5-25	30-50	---	15-25
Indian ricegrass	ORHY	5-10	5-15	5-15	---	5-10
Needleandthread	STCO4	5-10	---	---	---	5-10
Needlegrass	STIPA	---	5-15	---	---	---
Dropseed	SPORO	---	5-10	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	---	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	2- 5	---
Other perennial grasses	PPGG	2-10	5-20	5-15	10-25	2-10
Annual grasses	AAGG	---	1- 5	---	---	---
Perennial forbs	PPFF	5-10	3-10	5-10	2- 5	5-10
Annual forbs	AAFF	---	2- 5	---	2- 5	---
Low sagebrush	ARAR8	20-30	---	---	---	20-30
Nevada ephedra	EPNE	2- 5	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	---	15-20	---	---	---
Spiny hopsage	GRSP	---	5-10	---	10-20	---
Bud sagebrush	ARSP5	---	5-10	---	---	---
Winterfat	EULA5	---	2-10	---	---	---
Shadscale	ATCO	---	---	5-15	---	---
Bailey greasewood	SAVEE	---	---	5-10	---	---
Big sagebrush	ARTR2	---	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	---	10-30	---
Other shrubs	SSSS	5-15	10-20	5-15	5-15	5-15
Range site number		027X049N	029X049N	027X015N	027X029N	027X049N
Potential production (lb/acre):						
Favorable years		500	900	500	800	500
Normal years		350	600	350	500	350
Unfavorable years		200	300	200	100	200

3133--Mickey very gravelly sandy loam, 4 to 30 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Mickey	1	2	3	4
Galleta	HIJA	15-25	---	30-50	---	15-25
Indian ricegrass	ORHY	5-10	---	5-15	---	5-10
Needleandthread	STCO4	5-10	---	---	---	5-10
Sandberg bluegrass	POSE	---	2- 5	---	5-10	---
Basin wildrye	ELCI2	---	2- 5	---	---	---
Pine bluegrass	POSC	---	---	---	10-20	---
Thurber needlegrass	STTH2	---	---	---	5-15	---
Other perennial grasses	PPGG	2-10	10-25	5-15	5-10	2-10
Perennial forbs	PPFF	5-10	2- 5	5-10	5-10	5-10
Annual forbs	AAFF	---	2- 5	---	---	---
Low sagebrush	ARAR8	20-30	---	---	25-35	20-30
Nevada ephedra	EPNE	2- 5	---	---	---	2- 5
Big sagebrush	ARTR2	---	10-30	---	---	---
Rabbitbrush	CHRY9	---	10-30	---	---	---
Spiny hopsage	GRSP	---	10-20	---	---	---
Shadscale	ATCO	---	---	5-15	---	---
Bailey greasewood	SAVEB	---	---	5-10	---	---
Other shrubs	SSSS	5-15	5-15	5-15	5-10	5-15
Range site number		027X049N	027X029N	027X015N	027X020N	027X049N
Potential production (lb/acre):						
Favorable years		500	800	500	400	500
Normal years		350	500	350	200	350
Unfavorable years		200	100	200	100	200

## 3140--Loomer-Rowel-Downeyville association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Loomer	Rowel	Downeyville	1	2	3
Pine bluegrass	POSC	10-20	---	---	X	---	---
Thurber needlegrass	STTH2	5-15	---	---	---	---	---
Sandberg bluegrass	POSE	5-10	---	---	---	---	---
Galleta	HIJA	---	15-25	5-20	---	15-25	30-50
Indian ricegrass	ORHY	---	5-10	5-15	---	5-10	5-15
Needleandthread	STCO4	---	5-10	---	---	5-10	---
Needlegrass	STIPA	---	---	5-10	X	---	---
Bottlebrush squirreltail	SIHY	---	---	2- 5	---	---	---
Other perennial grasses	PPGG	5-10	2-10	5-10	X	2-10	5-15
Annual grasses	AAGG	---	---	1- 5	---	---	---
Perennial forbs	PPFF	5-10	5-10	5-10	X	5-10	5-10
Annual forbs	AAFF	---	---	2- 5	---	---	---
Low sagebrush	ARAR8	25-35	20-30	---	---	20-30	---
Nevada ephedra	EPNE	---	2- 5	2- 5	---	2- 5	---
Shadscale	ATCO	---	---	15-25	---	---	5-15
Bailey greasewood	SAVEB	---	---	5-15	---	---	5-10
Bud sagebrush	ARSP5	---	---	2- 5	---	---	---
Black sagebrush	ARARN	---	---	---	X	---	---
Douglas rabbitbrush	CHV18	---	---	---	X	---	---
Green ephedra	EPVI	---	---	---	X	---	---
Other shrubs	SSSS	5-10	5-15	10-20	X	5-15	5-15
Trees	TTTT	---	---	---	X	---	---
Range site number		027X020N	027X049N	029X022N	029X082N	027X049N	027X015N
Potential production (lb/acre):							
Favorable years		400	500	300	200	500	500
Normal years		200	350	200	125	350	350
Unfavorable years		100	200	100	50	200	200

3141--Loomer-Rowel-Wassit association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Loomer	Rowel	Wassit	1	2	3	4
Pine bluegrass	POSC	10-20	---	X	---	---	X	---
Thurber needlegrass	STH2	5-15	---	---	---	---	---	---
Sandberg bluegrass	POSE	5-10	---	---	---	---	---	---
Galleta	HIJA	---	15-25	---	---	5-20	---	---
Indian ricegrass	ORHY	---	5-10	X	---	5-15	X	X
Needleandthread	STCO4	---	5-10	---	---	---	---	---
Western needlegrass	STOC2	---	---	X	---	---	X	---
Bottlebrush squirreltail	SIHY	---	---	X	---	2- 5	X	X
Needlegrass	STIPA	---	---	---	---	5-10	---	---
Other perennial grasses	PPGG	5-10	2-10	X	---	5-10	X	X
Annual grasses	AAGG	---	---	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	X	---	5-10	X	X
Annual forbs	AAFF	---	---	---	---	2- 5	---	---
Low sagebrush	ARAR8	25-35	20-30	---	---	---	---	---
Nevada ephedra	EPNE	---	2- 5	---	---	2- 5	---	X
Mountain big sagebrush	ARTRV	---	---	X	---	---	X	---
Antelope bitterbrush	PUTR2	---	---	X	---	---	X	---
Green ephedra	EPVI	---	---	X	---	---	X	X
Shadscale	ATCO	---	---	---	---	15-25	---	---
Bailey greasewood	SAVEB	---	---	---	---	5-15	---	---
Bud sagebrush	ARSP5	---	---	---	---	2- 5	---	---
Black sagebrush	ARARN	---	---	---	---	---	---	X
Wyoming big sagebrush	ARTRW	---	---	---	---	---	---	X
Other shrubs	SSSS	5-10	5-15	X	---	10-20	X	X
Singleleaf pinyon	PIMO	---	---	X	---	---	X	X
Utah juniper	JUOS	---	---	X	---	---	X	X

Range site number	027X020N	027X049N	026X060N	None	029X022N	026X060N	029X081N
Potential production (lb/acre):							
Favorable years	400	500	300	---	300	300	125
Normal years	200	350	225	---	200	225	75
Unfavorable years	100	200	150	---	100	150	25

3142--Loomer-Downeyville-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Loomer	Downeyville	Rock outcrop	1	2	3
Pine bluegrass	POSC	10-20	---	---	---	---	---
Thurber needlegrass	STTH2	5-15	---	---	---	---	X
Sandberg bluegrass	POSE	5-10	---	---	---	2- 5	---
Galleta	HIJA	---	5-20	---	15-25	---	---
Indian ricegrass	ORHY	---	5-15	---	5-10	5-10	---
Needlegrass	STIPA	---	5-10	---	---	---	---
Bottlebrush squirreltail	SIHY	---	2- 5	---	---	2- 5	X
Needleandthread	STCO4	---	---	---	5-10	---	---
Desert needlegrass	STSP3	---	---	---	---	20-30	---
Ricegrass	ORYZO	---	---	---	---	---	X
Other perennial grasses	PPGG	5-10	5-10	---	2-10	2- 5	X
Annual grasses	AAGG	---	1- 5	---	---	---	---
Perennial forbs	PPFF	5-10	5-10	---	5-10	5-10	X
Annual forbs	AAFF	---	2- 5	---	---	---	---
Low sagebrush	ARAR8	25-35	---	---	20-30	---	X
Shadscale	ATCO	---	15-25	---	---	5-15	---
Bailey greasewood	SAVEB	---	5-15	---	---	---	---
Nevada ephedra	EPNE	---	2- 5	---	2- 5	---	---
Bud sagebrush	ARSP5	---	2- 5	---	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	10-20	---
Antelope bitterbrush	PUTR2	---	---	---	---	---	X
Green ephedra	EPVI	---	---	---	---	---	X
Other shrubs	SSSS	5-10	10-20	---	5-15	5-15	X
Singleleaf pinyon	PIMO	---	---	---	---	---	X
Utah juniper	JUOS	---	---	---	---	---	X

Range site number	027X020N	029X022N	None	027X049N	027X017N	026X064N
Potential production (lb/acre):						
Favorable years	400	300	---	500	400	325
Normal years	200	200	---	350	200	225
Unfavorable years	100	100	---	200	100	150

3143--Loomer-Rowel-Rubble land association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Loomer	Rowel	Rubble land	1	2	3
Pine bluegrass	POSC	10-20	---	---	---	---	20-30
Thurber needlegrass	STTH2	5-15	---	---	---	X	---
Sandberg bluegrass	POSE	5-10	---	---	---	---	---
Galleta	HIJA	---	15-25	---	5-20	---	---
Indian ricegrass	ORHY	---	5-10	---	5-15	---	---
Needleandthread	STCO4	---	5-10	---	---	---	---
Needlegrass	STIPA	---	---	---	5-10	---	5-15
Bottlebrush squirreltail	SIHY	---	---	---	2- 5	X	---
Ricegrass	ORYZO	---	---	---	---	X	---
Other perennial grasses	PPGG	5-10	2-10	---	5-10	X	5-15
Annual grasses	AAGG	---	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	---	5-10	X	5-10
Annual forbs	AAFF	---	---	---	2- 5	---	---
Low sagebrush	ARAR8	25-35	20-30	---	---	X	---
Nevada ephedra	EPNE	---	2- 5	---	2- 5	---	5-10
Shadscale	ATCO	---	---	---	15-25	---	---
Bailey greasewood	SAVEB	---	---	---	5-15	---	---
Bud sagebrush	ARSP5	---	---	---	2- 5	---	---
Antelope bitterbrush	PUTR2	---	---	---	---	X	---
Green ephedra	EPVI	---	---	---	---	X	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	10-20
Spiny hopsage	GRSP	---	---	---	---	---	5-15
Other shrubs	SSSS	5-10	5-15	---	10-20	X	5-10
Singleleaf pinyon	PIMO	---	---	---	---	X	---
Utah juniper	JUOS	---	---	---	---	X	---

Range site number	027X020N	027X049N	None	029X022N	026X064N	027X007N
Potential production (lb/acre):						
Favorable years	400	500	---	300	325	600
Normal years	200	350	---	200	225	450
Unfavorable years	100	200	---	100	150	300

3150--Zyzzi very gravelly sandy loam, 8 to 30 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Zyzzi	1	2	3	4
Galleta	HIJA	15-25	5-20	---	---	---
Indian ricegrass	ORHY	5-10	5-15	---	---	---
Needleandthread	STCO4	5-10	---	---	---	---
Needlegrass	STIPA	---	5-10	---	---	---
Bottlebrush squirreltail	SIHY	---	2- 5	X	---	---
Thurber needlegrass	STTH2	---	---	X	---	---
Ricegrass	ORYZO	---	---	X	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	2- 5	---
Other perennial grasses	PPGG	2-10	5-10	X	10-25	---
Annual grasses	AAGG	---	1- 5	---	---	---
Perennial forbs	PPFF	5-10	5-10	X	2- 5	---
Annual forbs	AAFF	---	2- 5	---	2- 5	---
Low sagebrush	ARAR8	20-30	---	X	---	---
Nevada ephedra	EPNE	2- 5	2- 5	---	---	---
Shadscale	ATCO	---	15-25	---	---	---
Bailey greasewood	SAVEB	---	5-15	---	---	---
Bud sagebrush	ARSP5	---	2- 5	---	---	---
Antelope bitterbrush	PUTR2	---	---	X	---	---
Green ephedra	EPVI	---	---	X	---	---
Big sagebrush	ARTR2	---	---	---	10-30	---
Rabbitbrush	CHRY9	---	---	---	10-30	---
Spiny hopsage	GRSP	---	---	---	10-20	---
Other shrubs	SSSS	5-15	10-20	X	5-15	---
Singleleaf pinyon	PIMO	---	---	X	---	---
Utah juniper	JUOS	---	---	X	---	---
Range site number		027X049N	029X022N	026X064N	027X029N	None
Potential production (lb/acre):						
Favorable years		500	300	325	800	---
Normal years		350	200	225	500	---
Unfavorable years		200	100	150	100	---

3151--Zyzzzi-Nupart association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Zyzzzi	Nupart	1	2	3	4
Galleta	HIJA	15-25	---	---	---	5-20	---
Indian ricegrass	ORHY	5-10	X	X	---	5-15	---
Needleandthread	STCO4	5-10	---	---	---	---	---
Western needlegrass	STOC2	---	X	---	---	---	---
Pine bluegrass	POSC	---	X	---	---	---	---
Bottlebrush squirreltail	SIHY	---	X	---	X	2- 5	---
Desert needlegrass	STSP3	---	---	X	---	---	---
Thurber needlegrass	STTH2	---	---	---	X	---	---
Ricegrass	ORYZO	---	---	---	X	---	---
Needlegrass	STIPA	---	---	---	---	5-10	---
Other perennial grasses	PPGG	2-10	X	X	X	5-10	---
Annual grasses	AAGG	---	---	---	---	1- 5	---
Perennial forbs	PPFF	5-10	X	X	X	5-10	---
Annual forbs	AAFF	---	---	---	---	2- 5	---
Low sagebrush	ARAR8	20-30	---	---	X	---	---
Nevada ephedra	EPNE	2- 5	---	---	---	2- 5	---
Mountain big sagebrush	ARTRV	---	X	---	---	---	---
Antelope bitterbrush	PUTR2	---	X	X	X	---	---
Green ephedra	EPVI	---	X	---	X	---	---
Wyoming big sagebrush	ARTRW	---	---	X	---	---	---
Douglas rabbitbrush	CHVI8	---	---	X	---	---	---
Shadscale	ATCO	---	---	---	---	15-25	---
Bailey greasewood	SAVEB	---	---	---	---	5-15	---
Bud sagebrush	ARSP5	---	---	---	---	2- 5	---
Other shrubs	SSSS	5-15	X	X	X	10-20	---
Singleleaf pinyon	PIMO	---	X	X	X	---	---
Utah juniper	JUOS	---	X	X	X	---	---
Range site number		027X049N	026X060N	026X061N	026X064N	029X022N	None
Potential production (lb/acre):							
Favorable years		500	300	225	325	300	---
Normal years		350	225	200	225	200	---
Unfavorable years		200	150	150	150	100	---

3170--Ravenell-Haar-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Ravenell	Haar	Rock outcrop	1	2	3
Galleta	HIJA	15-25	---	---	15-25	---	---
Indian ricegrass	ORHY	5-10	5-10	---	5-10	---	---
Needleandthread	STCO4	5-10	---	---	5-10	---	---
Desert needlegrass	STSP3	---	10-15	---	---	---	---
Bottlebrush squirreltail	SIHY	---	5-10	---	---	---	X
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---
Thurber needlegrass	STTH2	---	---	---	---	---	X
Ricegrass	ORYZO	---	---	---	---	---	X
Other perennial grasses	PPGG	2-10	2- 5	---	2-10	10-25	X
Perennial forbs	PPFF	5-10	5-10	---	5-10	2- 5	X
Annual forbs	AAFF	---	---	---	---	2- 5	---
Low sagebrush	ARAR8	20-30	---	---	20-30	---	X
Nevada ephedra	EPNE	2- 5	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	15-20	---	---	---	---
Douglas rabbitbrush	CHVI8	---	5-10	---	---	---	---
Purple sage	SACA9	---	5-10	---	---	---	---
Antelope bitterbrush	PUTR2	---	5-10	---	---	---	X
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRS9	---	---	---	---	10-30	---
Spiny hopsage	GRSP	---	---	---	---	10-20	---
Green ephedra	EPVI	---	---	---	---	---	X
Other shrubs	SSSS	5-15	2- 5	---	5-15	5-15	X
Utah juniper	JUOS	---	2- 5	---	---	---	X
Singleleaf pinyon	PIMO	---	---	---	---	---	X

Range site number	027X049N	026X029N	None	027X049N	027X029N	026X064N
Potential production (lb/acre):						
Favorable years	500	200	---	500	800	325
Normal years	350	150	---	350	500	225
Unfavorable years	200	100	---	200	100	150

3191--Wellseed-Mickey-Veet association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Wellseed	Mickey	Veet	1	2	3	4
Galleta	HIJA	5-15	15-25	5-25	---	---	---	---
Indian ricegrass	ORHY	5-10	5-10	5-15	5-10	5-10	---	---
Needlegrass	STIPA	2-10	---	5-15	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	1- 5	5-10	5-10	---	---
Needleandthread	STCO4	---	5-10	---	---	---	---	---
Dropseed	SPORO	---	---	5-10	---	---	---	---
Thurber needlegrass	STH2	---	---	---	20-40	---	---	---
Bluegrass	POA++	---	---	---	5-15	---	---	---
Desert needlegrass	STSP3	---	---	---	---	10-15	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	---	2- 5	5-15
Alkali sacaton	SPAI	---	---	---	---	---	---	20-30
Inland saltgrass	DIST	---	---	---	---	---	---	10-20
Creeping wildrye	ELTR3	---	---	---	---	---	---	5-10
Baltic rush	JUBA	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-20	2-10	5-20	5-10	2- 5	10-25	5-10
Annual grasses	AAGG	1- 5	---	1- 5	---	---	---	---
Perennial forbs	PPFF	5-10	5-10	3-10	5-10	5-10	2- 5	5-10
Annual forbs	AAFF	2- 5	---	2- 5	---	---	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	---	15-20	---	15-20	---	---
Fourwing saltbush	ATCA2	5-10	---	---	---	---	---	---
Nevada ephedra	EPNE	2- 5	2- 5	---	---	---	---	---
Winterfat	EULA5	2- 5	---	2-10	---	---	---	---
Spiny hopsage	GRSP	2- 5	---	5-10	---	---	10-20	---
Low sagebrush	ARAR8	---	20-30	---	10-20	---	---	---
Bud sagebrush	ARSP5	---	---	5-10	---	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	2- 5	---	---	---
Douglas rabbitbrush	CHVI8	---	---	---	---	5-10	---	---
Purple sage	SACA9	---	---	---	---	5-10	---	---
Antelope bitterbrush	PUTR2	---	---	---	---	5-10	---	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30	---
Rabbitbrush	CHRY9	---	---	---	---	---	10-30	---
Black greasewood	SAVE4	---	---	---	---	---	---	5-10
Iodinebush	ALOC2	---	---	---	---	---	---	2- 5
Seepweed	SUAED	800	---	---	---	---	---	2- 5
Other shrubs	SSSS	10-25	5-15	10-20	5-10	2- 5	5-15	5-10
Utah juniper	JUOS	---	---	---	---	2- 5	---	---
Other trees	TTTT	500	---	---	---	---	---	5-10

Range site number	029X006N	027X049N	029X049N	026X025N	026X029N	027X029N	027X005N
Potential production (lb/acre):							
Favorable years	800	500	900	400	200	800	2,000
Normal years	500	350	600	300	150	500	1,500
Unfavorable years	300	200	300	200	100	100	1,000

3192--Wellsed-Ravenell-Haar association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Wellsed	Ravenell	Haar	1	2	3
Galleta	HIJA	5-15	15-25	---	5-25	---	---
Indian ricegrass	ORHY	5-10	5-10	5-10	5-15	5-10	---
Needlegrass	STIPA	2-10	---	---	5-15	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	5-10	1- 5	5-10	---
Needleandthread	STCO4	---	5-10	---	---	---	---
Desert needlegrass	STSP3	---	---	10-15	---	---	---
Dropseed	SPORO	---	---	---	5-10	---	---
Thurber needlegrass	STTH2	---	---	---	---	20-40	---
Bluegrass	POA++	---	---	---	---	5-15	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-20	2-10	2- 5	5-20	5-10	10-25
Annual grasses	AAGG	1- 5	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	5-10	3-10	5-10	2- 5
Annual forbs	AAFF	2- 5	---	---	2- 5	---	2- 5
Wyoming big sagebrush	ARTRW	15-20	---	15-20	15-20	---	---
Fourwing saltbush	ATCA2	5-10	---	---	---	---	---
Nevada ephedra	EPNE	2- 5	2- 5	---	---	---	---
Winterfat	EULA5	2- 5	---	---	2-10	---	---
Spiny hopsage	GRSP	2- 5	---	---	5-10	---	10-20
Low sagebrush	ARAR8	---	20-30	---	---	10-20	---
Douglas rabbitbrush	CHVI8	---	---	5-10	---	---	---
Purple sage	SACA9	---	---	5-10	---	---	---
Antelope bitterbrush	PUTR2	---	---	5-10	---	---	---
Bud sagebrush	ARSF5	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	10-30
Other shrubs	SSSS	10-25	5-15	2- 5	10-20	5-10	5-15
Utah juniper	JUOS	---	---	2- 5	---	---	---
Range site number		029X006N	027X049N	026X029N	029X049N	026X025N	027X029N
Potential production (lb/acre):							
Favorable years		800	500	200	900	400	800
Normal years		500	350	150	600	300	500
Unfavorable years		300	200	100	300	200	100

3193--Wellseed-Wedlar association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Wellseed	Wedlar	1	2	3	4
Galleta	HIJA	5-15	5-15	5-25	---	15-25	---
Indian ricegrass	ORHY	5-10	5-10	5-15	---	5-10	5-10
Needlegrass	STIPA	2-10	2-10	5-15	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5	---	---	5-10
Dropseed	SPORO	---	---	5-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---	---
Basin wildrye	ELCI2	---	---	---	2- 5	---	---
Needleandthread	STCO4	---	---	---	---	5-10	---
Desert needlegrass	STSP3	---	---	---	---	---	10-15
Other perennial grasses	PPGG	10-20	10-20	5-20	10-25	2-10	2- 5
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	---	---
Perennial forbs	PPFF	5-10	5-10	3-10	2- 5	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	---	---
Wyoming big sagebrush	ARTRW	15-20	15-20	15-20	---	---	15-20
Fourwing saltbush	ATCA2	5-10	5-10	---	---	---	---
Nevada ephedra	EPNE	2- 5	2- 5	---	---	2- 5	---
Winterfat	EULA5	2- 5	2- 5	2-10	---	---	---
Spiny hopsage	GRSP	2- 5	2- 5	5-10	10-20	---	---
Bud sagebrush	ARSP5	---	---	5-10	---	---	---
Big sagebrush	ARTR2	---	---	---	10-30	---	---
Rabbitbrush	CHRYS9	---	---	---	10-30	---	---
Low sagebrush	ARAR8	---	---	---	---	20-30	---
Douglas rabbitbrush	CHVI8	---	---	---	---	---	5-10
Purple sage	SACA9	---	---	---	---	---	5-10
Antelope bitterbrush	PUTR2	---	---	---	---	---	5-10
Other shrubs	SSSS	10-25	10-25	10-20	5-15	5-15	2- 5
Utah juniper	JUOS	---	---	---	---	---	2- 5

Range site number	029X006N	029X006N	029X049N	027X029N	027X049N	026X029N
Potential production (lb/acre):						
Favorable years	800	800	900	800	500	200
Normal years	500	500	600	500	350	150
Unfavorable years	300	300	300	100	200	100

## 3194--Wellsted-Smedley-Mickey association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Wellsted	Smedley	Mickey	1	2	3	4
Galleta	HIJA	5-15	30-50	15-25	5-25	---	---	5-15
Indian ricegrass	ORHY	5-10	5-15	5-10	5-15	10-20	---	5-10
Needlegrass	STIPA	2-10	---	---	5-15	---	---	2-10
Bottlebrush squirreltail	SIHY	1- 5	---	---	1- 5	5-10	---	1- 5
Needleandthread	STCO4	---	---	5-10	---	---	---	---
Dropseed	SPORO	---	---	---	5-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-20	5-15	2-10	5-20	5-10	10-25	10-20
Annual grasses	AAGG	1- 5	---	---	1- 5	---	---	1- 5
Perennial forbs	PPFF	5-10	5-10	5-10	3-10	3- 7	2- 5	5-10
Annual forbs	AAFF	2- 5	---	---	2- 5	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	---	---	15-20	---	---	15-20
Fourwing saltbush	ATCA2	5-10	---	---	---	---	---	5-10
Nevada ephedra	EPNE	2- 5	---	2- 5	---	---	---	2- 5
Winterfat	EULA5	2- 5	---	---	2-10	---	---	2- 5
Spiny hopsage	GRSP	2- 5	---	---	5-10	---	10-20	2- 5
Shadscale	ATCO	---	5-15	---	---	15-30	---	---
Bailey greasewood	SAVEB	---	5-10	---	---	10-20	---	---
Low sagebrush	ARAR8	---	---	20-30	---	---	---	---
Bud sagebrush	ARSP5	---	---	---	5-10	5-15	---	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30	---
Rabbitbrush	CHRY59	---	---	---	---	---	10-30	---
Other shrubs	SSSS	10-25	5-15	5-15	10-20	5-10	5-15	10-25
Range site number		029X006N	027X015N	027X049N	029X049N	027X018N	027X029N	029X006N
Potential production (lb/acre):								
Favorable years		800	500	500	900	500	800	800
Normal years		500	350	350	600	300	500	500
Unfavorable years		300	200	200	300	100	100	300

3210--Fallon-Fettic Variant-Fallon, saline-sodic, association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Fallon	Fettic Variant	Fallon, saline-sodic	1	2	3	4
Creeping wildrye	ELTR3	X	X	5-10	---	---	---	---
Basin wildrye	ELCI2	X	X	5-15	---	---	---	---
Western wheatgrass	AGSM	X	X	---	---	---	---	---
Slender wheatgrass	AGTR	X	X	---	---	---	---	---
Inland saltgrass	DIST	X	X	10-20	---	---	---	---
Alkali sacaton	SPAI	---	---	20-30	---	---	---	---
Baltic rush	JUBA	---	---	5-10	---	---	---	---
Indian ricegrass	ORHY	---	---	---	10-20	5-15	5-10	5-10
Bottlebrush squirreltail	SIHY	---	---	---	5-10	1- 5	1- 5	---
Galleta	HIJA	---	---	---	---	5-25	5-15	15-25
Needlegrass	STIPA	---	---	---	---	5-15	2-10	---
Dropseed	SPORO	---	---	---	---	5-10	---	---
Needleandthread	STCO4	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	X	X	5-10	5-10	5-20	10-20	2-10
Annual grasses	AAGG	---	---	---	---	1- 5	1- 5	---
Perennial forbs	PPFF	X	X	5-10	3- 7	3-10	5-10	5-10
Annual forbs	AAFF	---	---	2- 5	2- 5	2- 5	2- 5	---
Basin big sagebrush	ARTRT	X	X	---	---	---	---	---
Rubber rabbitbrush	CHNA2	X	X	---	---	---	---	---
Black greasewood	SAVE4	---	---	5-10	---	---	---	---
Iodinebush	ALOC2	---	---	2- 5	---	---	---	---
Seepweed	SUAED	---	---	2- 5	---	---	---	---
Shadscale	ATCO	---	---	---	15-30	---	---	---
Bailey greasewood	SAVEB	---	---	---	10-20	---	---	---
Bud sagebrush	ARSP5	---	---	---	5-15	5-10	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	15-20	15-20	---
Spiny hopsage	GRSP	---	---	---	---	5-10	2- 5	---
Winterfat	EULA5	---	---	---	---	2-10	2- 5	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-10	---
Nevada ephedra	EPNE	---	---	---	---	---	2- 5	2- 5
Low sagebrush	ARAR8	---	---	---	---	---	---	20-30
Other shrubs	SSSS	---	---	5-10	5-10	10-20	10-25	5-15
Fremont cottonwood	POFR2	X	X	---	---	---	---	---
Other trees	TTTT	---	---	5-10	---	---	---	---

Range site number	027X002N	027X002N	027X005N	027X018N	029X049N	029X006N	027X049N
Potential production (lb/acre):							
Favorable years	3,000	3,000	2,000	500	900	800	500
Normal years	2,500	2,500	1,500	300	600	500	350
Unfavorable years	2,000	2,000	1,000	100	300	300	200

3212--Fallon-Slaw complex

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Fallon	Slaw	1	2	3	4
Creeping wildrye	ELTR3	X	---	X	---	---	---
Basin wildrye	ELCI2	X	15-25	X	15-25	---	---
Western wheatgrass	AGSM	X	---	X	---	---	---
Slender wheatgrass	AGTR	X	---	X	---	---	---
Inland saltgrass	DIST	X	---	X	---	---	---
Alkali sacaton	SPAI	---	5-10	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	5-10	---	5-10	---	---
Sedge	CAREX	---	---	---	---	---	---
Alkali muhly	MUAS	---	---	---	---	---	---
Desert needlegrass	STSP3	---	---	---	---	---	---
Other perennial grasses	PPGG	X	5-10	X	5-10	---	---
Perennial forbs	PPFF	X	5-10	X	5-10	---	---
Annual forbs	AAFF	---	2- 5	---	2- 5	---	---
Basin big sagebrush	ARTRT	X	---	X	---	---	---
Rubber rabbitbrush	CHNA2	X	---	X	---	---	---
Torrey quailbush	ATTO	---	40-60	---	40-60	---	---
Black greasewood	SAVE4	---	5-15	---	5-15	---	---
Fourwing saltbush	ATCA2	---	2- 5	---	2- 5	---	---
Shadscale	ATCO	---	2- 5	---	2- 5	---	---
Nevada ephedra	EPNE	---	---	---	---	---	---
Cooper wolfberry	LYCO2	---	---	---	---	---	---
Burrobrush	HYMEN3	---	---	---	---	---	---
Knapp brickellbush	BRKN	---	---	---	---	---	---
Other shrubs	SSSS	---	5-10	---	5-10	---	---
Fremont cottonwood	POFR2	X	---	X	---	---	---
Range site number		027X002N	027X041N	027X002N	027X041N	None	None
Potential production (lb/acre):							
Favorable years		3,000	1,500	3,000	1,500	---	---
Normal years		2,500	1,000	2,500	1,000	---	---
Unfavorable years		2,000	600	2,000	600	---	---

3220--Rowel very cobbly sandy loam, 8 to 30 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Rowel	1	2	3	4
Galleta	HIJA	15-25	5-15	5-25	---	---
Indian ricegrass	ORHY	5-10	5-10	5-15	---	5-10
Needleandthread	STCO4	5-10	---	---	---	---
Needlegrass	STIPA	---	2-10	5-15	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	1- 5	---	2- 5
Dropseed	SPORO	---	---	5-10	---	---
Desert needlegrass	STSP3	---	---	---	---	20-30
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Other perennial grasses	PPGG	2-10	10-20	5-20	---	2- 5
Annual grasses	AAGG	---	1- 5	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	3-10	---	5-10
Annual forbs	AAFF	---	2- 5	2- 5	---	---
Low sagebrush	ARAR8	20-30	---	---	---	---
Nevada ephedra	EPNE	2- 5	2- 5	---	---	---
Wyoming big sagebrush	ARTRW	---	15-20	15-20	---	---
Fourwing saltbush	ATCA2	---	5-10	---	---	---
Winterfat	EULA5	---	2- 5	2-10	---	---
Spiny hopsage	GRSP	---	2- 5	5-10	---	---
Bud sagebrush	ARSP5	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	10-20
Shadscale	ATCO	---	---	---	---	5-15
Other shrubs	SSSS	5-15	10-25	10-20	---	5-15
Range site number		027X049N	029X006N	029X049N	None	027X017N
Potential production (lb/acre):						
Favorable years		500	800	900	---	400
Normal years		350	500	600	---	200
Unfavorable years		200	300	300	---	100

3221--Rowel-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Rowel	Rock outcrop	1	2	3
Galleta	HIJA	15-25	---	5-15	5-25	---
Indian ricegrass	ORHY	5-10	---	5-10	5-15	5-10
Needleandthread	STCO4	5-10	---	---	---	---
Needlegrass	STIPA	---	---	2-10	5-15	---
Bottlebrush squirreltail	SIHY	---	---	1- 5	1- 5	2- 5
Dropseed	SPORO	---	---	---	5-10	---
Desert needlegrass	STSP3	---	---	---	---	20-30
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Other perennial grasses	PPGG	2-10	---	10-20	5-20	2- 5
Annual grasses	AAGG	---	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	---	5-10	3-10	5-10
Annual forbs	AAFF	---	---	2- 5	2- 5	---
Low sagebrush	ARAR8	20-30	---	---	---	---
Nevada ephedra	EPNE	2- 5	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	15-20	15-20	---
Fourwing saltbush	ATCA2	---	---	5-10	---	---
Winterfat	EULA5	---	---	2- 5	2-10	---
Spiny hopsage	GRSP	---	---	2- 5	5-10	---
Bud sagebrush	ARSP5	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	10-20
Shadscale	ATCO	---	---	---	---	5-15
Other shrubs	SSSS	5-15	---	10-25	10-20	5-15
Range site number		027X049N	None	029X006N	029X049N	027X017N
Potential production (lb/acre):						
Favorable years		500	---	800	900	400
Normal years		350	---	500	600	200
Unfavorable years		200	---	300	300	100

3300--Typic Torriorthents, 4 to 15 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions	
		Soil name	Inclusion number--
		Typic Torriorthents	1
Inland saltgrass	DIST	X	---
Sedge	CAREX	X	---
Alkali muhly	MUAS	X	---
Desert needlegrass	STSP3	X	---
Indian ricegrass	ORHY	---	10-20
Bottlebrush squirreltail	SIHY	---	5-10
Other perennial grasses	PPGG	---	5-10
Perennial forbs	PPFF	---	3- 7
Annual forbs	AAFF	---	2- 5
Fourwing saltbush	ATCA2	X	---
Nevada ephedra	EPNE	X	---
Cooper wolfberry	LYCO2	X	5-20
Burrobrush	HYMEN3	X	---
Knapp brickellbush	BRKN	X	---
Shadscale	ATCO	---	10-20
Bailey greasewood	SAVEB	---	5-10
Other shrubs	SSSS	---	5-15
Range site number		Variable	027X043N
Potential production (lb/acre):			
Favorable years		---	400
Normal years		---	200
Unfavorable years		---	100

## 3310--Veta-Smedley association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Veta	Smedley	1	2	3
Indian ricegrass	ORHY	5-15	5-15	5-10	---	5-10
Desert needlegrass	STSP3	2- 5	---	---	---	---
Galleta	HIJA	---	30-50	---	---	15-25
Sandberg bluegrass	POSE	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	2- 5	---
Needleandthread	STCO4	---	---	---	---	5-10
Other perennial grasses	PPGG	---	5-15	5-10	10-25	2-10
Annual grasses	AAGG	---	---	2- 4	---	---
Perennial forbs	PPFF	1- 3	5-10	2- 6	2- 5	5-10
Annual forbs	AAFF	---	---	1- 5	2- 5	---
Wyoming big sagebrush	ARTRW	20-40	---	---	---	---
Spiny hopsage	GRSP	15-30	---	---	10-20	---
Shadscale	ATCO	---	5-15	---	---	---
Bailey greasewood	SAVEB	---	5-10	2-10	---	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Nevada ephedra	EPNE	---	---	2- 5	---	2- 5
Cooper wolfberry	LYCO2	---	---	2- 5	---	---
Big sagebrush	ARTR2	---	---	---	10-30	---
Rabbitbrush	CHRY9	---	---	---	10-30	---
Low sagebrush	ARAR8	---	---	---	---	20-30
Other shrubs	SSSS	2- 5	5-15	10-20	5-15	5-15
Range site number		026X024N	027X015N	029X041N	027X029N	027X049N
Potential production (lb/acre):						
Favorable years		400	500	500	800	500
Normal years		300	350	300	500	350
Unfavorable years		200	200	100	100	200

4000--Garhill-Blacktop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Garhill	Blacktop	1	2	3	4
Indian ricegrass	ORHY	5-20	2- 5	2- 5	---	---	---
Galleta	HIJA	5-10	---	10-20	---	---	---
King desertgrass	BLKI	---	1- 2	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 2	---	2-10	---	---
Needlegrass	STIPA	---	---	5-10	---	5-15	---
Bluegrass	POA++	---	---	---	10-30	---	---
Pine bluegrass	POSC	---	---	---	---	20-30	---
Other perennial grasses	PPGG	5-10	1- 5	5-10	2-10	5-15	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	---	---
Perennial forbs	PPFF	5-10	2- 5	5-10	5-10	5-10	---
Annual forbs	AAFF	2- 5	1- 5	2- 5	---	---	---
Spiny menodora	MESP2	10-30	---	10-25	---	---	---
Bailey greasewood	SAVEB	5-15	10-15	5-10	5-10	---	---
Shadscale	ATCO	5-15	40-60	2- 5	10-20	---	---
Bud sagebrush	ARSP5	5-10	2- 5	2- 5	5-10	---	---
Nevada ephedra	EPNE	5-10	---	5-10	---	5-10	---
Nevada dalea	DAPO2	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---	---
Anderson wolfberry	LYAN	---	---	5-10	---	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	10-20	---
Spiny hopsage	GRSP	---	---	---	---	5-15	---
Other shrubs	SSSS	10-20	5-15	15-25	5-15	5-10	---
Range site number		029X036N	029X033N	029X037N	027X030N	027X007N	None
Potential production (lb/acre):							
Favorable years		400	100	300	400	600	---
Normal years		300	50	200	300	450	---
Unfavorable years		100	25	100	200	300	---

4021--Argalt-Gabbvally association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Argalt	Gabbvally	1	2	3	4
Galleta	HIJA	5-15	5-15	---	---	5-15	---
Indian ricegrass	ORHY	5-10	5-10	---	2- 5	5-10	---
Needlegrass	STIPA	2-10	5-10	5-15	---	5-10	---
Bluegrass	POA++	2-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 4	---	1- 2	1- 4	---
Pine bluegrass	POSC	---	---	20-30	---	---	---
King desertgrass	BLKI	---	---	---	1- 2	---	---
Other perennial grasses	PPGG	10-15	5-20	5-15	1- 5	5-20	---
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	4-10	5-10	2- 5	4-10	---
Annual forbs	AAFF	1- 5	2- 7	---	1- 5	2- 7	---
Black sagebrush	ARARN	15-20	---	---	---	---	---
Nevada ephedra	EPNE	5-10	5-10	5-10	---	5-10	---
Bud sagebrush	ARSP5	2- 5	---	---	2- 5	---	---
Winterfat	EULA5	2- 5	---	---	---	---	---
Wyoming big sagebrush	ARTRW	---	20-30	10-20	---	20-30	---
Spiny hopsage	GRSP	---	---	5-15	---	---	---
Shadscale	ATCO	---	---	---	40-60	---	---
Bailey greasewood	SAVEB	---	---	---	10-15	---	---
Nevada dalea	DAPO2	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	---	---
Other shrubs	SSSS	10-20	10-20	5-10	5-15	10-20	---

Range site number	029X014N	029X010N	027X007N	029X033N	029X010N	None
Potential production (lb/acre):						
Favorable years	500	600	600	100	600	---
Normal years	300	400	450	50	400	---
Unfavorable years	100	200	300	25	200	---

4030--Koyen-Geer association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Koyen	Geer	1	2
Galleta	HIJA	5-20	5-20	---	5-20
Indian ricegrass	ORHY	5-10	5-15	5-10	5-10
Dropseed	SPORO	5-15	5-10	---	5-15
Needlegrass	STIPA	2- 5	2-10	---	2- 5
Bottlebrush squirreltail	SIHY	---	1- 5	---	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5
Perennial forbs	PPFF	5- 7	5-10	2- 6	5- 7
Annual forbs	AAFF	2- 4	1- 5	1- 5	2- 4
Fourwing saltbush	ATCA2	10-15	2-10	5-15	10-15
Winterfat	EULA5	5-20	20-30	---	5-20
Bud sagebrush	ARSP5	5-10	10-15	---	5-10
Spiny hopsage	GRSP	2- 8	---	---	2- 8
Anderson wolfberry	LYAN	1- 5	---	---	1- 5
Nevada ephedra	EPNE	---	1- 5	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---
Burrobrush	HYMEN3	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	5-10	---
Bailey greasewood	SAVEB	---	---	2-10	---
Cooper wolfberry	LYCO2	---	---	2- 5	---
Other shrubs	SSSS	10-25	10-15	10-20	10-25
Range site number		029X046N	029X020N	029X041N	029X046N
Potential production (lb/acre):					
Favorable years		450	400	500	450
Normal years		350	250	300	350
Unfavorable years		175	100	100	175

4050--Haarvar-Wrango association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Haarvar	Wrango	1	2	3	4
Galleta	HIJA	5-15	---	5-25	5-15	---	5-20
Indian ricegrass	ORHY	5-10	15-25	5-15	5-10	---	5-10
Needlegrass	STIPA	2-10	---	5-15	2-10	---	5-15
Bluegrass	POA++	2-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	1- 5	1- 5	---	---
Needleandthread	STCO4	---	5-10	---	---	---	---
Basin wildrye	ELCI2	---	2- 5	---	---	2- 5	---
Dropseed	SPORO	---	---	5-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-15	10-20	5-20	10-20	10-25	10-15
Annual grasses	AAGG	1- 5	---	1- 5	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	5-10	3-10	5-10	2- 5	3- 8
Annual forbs	AAFF	1- 5	---	2- 5	2- 5	2- 5	2- 5
Black sagebrush	ARARN	15-20	20-30	---	---	---	20-25
Nevada ephedra	EPNE	5-10	---	---	2- 5	---	2- 5
Bud sagebrush	ARSP5	2- 5	2- 5	5-10	---	---	5-10
Winterfat	EULA5	2- 5	5-10	2-10	2- 5	---	2- 5
Small rabbitbrush	CHVIS	---	2- 5	---	---	---	---
Wyoming big sagebrush	ARTRW	---	---	15-20	15-20	---	---
Spiny hopsage	GRSP	---	---	5-10	2- 5	10-20	---
Fourwing saltbush	ATCA2	---	---	---	5-10	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRY59	---	---	---	---	10-30	---
Other shrubs	SSSS	10-20	10-20	10-20	10-25	5-15	10-20
Range site number		029X014N	028B011N	029X049N	029X006N	027X029N	029X008N
Potential production (lb/acre):							
Favorable years		500	1,000	900	800	800	700
Normal years		300	700	600	500	500	400
Unfavorable years		100	400	300	300	100	200

4061--Truhoy-Wardenot association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Truhoy	Wardenot	1	2	3
Indian ricegrass	ORHY	5-20	5-20	5-10	5-20	2- 5
Galleta	HIJA	5-10	5-10	---	5-10	10-20
Needlegrass	STIPA	---	---	---	---	5-10
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 6	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	10-30	---	10-30	10-25
Bailey greasewood	SAVEB	5-15	5-15	2-10	5-15	5-10
Shadscale	ATCO	5-15	5-15	---	5-15	2- 5
Bud sagebrush	ARSP5	5-10	5-10	---	5-10	2- 5
Nevada ephedra	EPNE	5-10	5-10	2- 5	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---
Anderson wolfberry	LYAN	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	10-20	10-20	15-25
Range site number		029X036N	029X036N	029X041N	029X036N	029X037N
Potential production (lb/acre):						
Favorable years		400	400	500	400	300
Normal years		300	300	300	300	200
Unfavorable years		100	100	100	100	100

4062--Truhoy gravelly loamy sand, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Truhoy	1	2	3	4
Indian ricegrass	ORHY	5-20	5-20	2- 5	5-10	2- 5
Galleta	HIJA	5-10	5-10	---	---	---
King desertgrass	BLKI	---	---	1- 2	---	1- 2
Bottlebrush squirreltail	SIHY	---	---	1- 2	---	1- 2
Other perennial grasses	PPGG	5-10	5-10	1- 5	5-10	1- 5
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 5	2- 6	2- 5
Annual forbs	AAFF	2- 5	2- 5	1- 5	1- 5	1- 5
Spiny menodora	MESP2	10-30	10-30	---	---	---
Bailey greasewood	SAVEB	5-15	5-15	10-15	2-10	10-15
Shadscale	ATCO	5-15	5-15	40-60	---	40-60
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	2- 5
Nevada ephedra	EPNE	5-10	5-10	---	2- 5	---
Nevada dalea	DAPO2	---	---	5-10	---	5-10
Cooper wolfberry	LYCO2	---	---	2- 5	2- 5	2- 5
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	5-15	10-20	5-15

Range site number	029X036N	029X036N	029X033N	029X041N	029X033N
Potential production (lb/acre):					
Favorable years	400	400	100	500	100
Normal years	300	300	50	300	50
Unfavorable years	100	100	25	100	25

4070--Zadvar-Stewval association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Zadvar	Stewval	1	2	3	4
Galleta	HIJA	5-20	5-15	---	5-25	---	---
Needlegrass	STIPA	5-15	2-10	---	5-15	---	---
Indian ricegrass	ORHY	5-10	5-10	15-25	5-15	---	---
Bluegrass	POA++	---	2-10	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	---	1- 5	---	---
Needleandthread	STCO4	---	---	5-10	---	---	---
Basin wildrye	ELCI2	---	---	2- 5	---	2- 5	---
Dropseed	SPORO	---	---	---	5-10	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-15	10-15	10-20	5-20	10-25	---
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	---	---
Perennial forbs	PPFF	3- 8	5-10	5-10	3-10	2- 5	---
Annual forbs	AAFF	2- 5	1- 5	---	2- 5	2- 5	---
Black sagebrush	ARARN	20-25	15-20	20-30	---	---	---
Bud sagebrush	ARSP5	5-10	2- 5	2- 5	5-10	---	---
Winterfat	EULA5	2- 5	2- 5	5-10	2-10	---	---
Nevada ephedra	EPNE	2- 5	5-10	---	---	---	---
Small rabbitbrush	CHVIS	---	---	2- 5	---	---	---
Wyoming big sagebrush	ARTRW	---	---	---	15-20	---	---
Spiny hopsage	GRSP	---	---	---	5-10	10-20	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRY9	---	---	---	---	10-30	---
Other shrubs	SSSS	10-20	10-20	10-20	10-20	5-15	---
Range site number		029X008N	029X014N	028B011N	029X049N	027X029N	None
Potential production (lb/acre):							
Favorable years		700	500	1,000	900	800	---
Normal years		400	300	700	600	500	---
Unfavorable years		200	100	400	300	100	---

4071--Zadvar-Wrango association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Zadvar	Wrango	1	2	3	4
Galleta	HIJA	5-20	---	5-20	5-20	5-10	---
Needlegrass	STIPA	5-15	---	5-15	5-15	---	---
Indian ricegrass	ORHY	5-10	15-25	5-10	5-10	5-20	---
Basin wildrye	ELCI2	---	2- 5	---	---	---	2- 5
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Bluegrass	POA++	---	---	---	---	---	---
Bottlebrush squirreltail	SIHY	---	---	---	---	---	---
Other perennial grasses	PPGG	10-15	10-20	10-15	10-15	5-10	10-25
Annual grasses	AAGG	1- 5	---	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	3- 8	5-10	3- 8	3- 8	5-10	2- 5
Annual forbs	AAFF	2- 5	---	2- 5	2- 5	2- 5	2- 5
Black sagebrush	ARARN	20-25	20-30	20-25	20-25	---	---
Bud sagebrush	ARSP5	5-10	2- 5	5-10	5-10	5-10	---
Winterfat	EULA5	2- 5	5-10	2- 5	2- 5	---	---
Nevada ephedra	EPNE	2- 5	---	2- 5	2- 5	5-10	---
Small rabbitbrush	CHVIS	---	2- 5	---	---	---	---
Spiny menodora	MESP2	---	---	---	---	10-30	---
Bailey greasewood	SAVEB	---	---	---	---	10-30	---
Shadscale	ATCO	---	---	---	---	5-15	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	10-20
Other shrubs	SSSS	10-20	10-20	10-20	10-20	10-20	5-15

Range site number	029X008N	028B011N	029X008N	029X008N	029X036N	027X029N
Potential production (lb/acre):						
Favorable years	700	1,000	700	700	400	800
Normal years	400	700	400	400	300	500
Unfavorable years	200	400	200	200	100	100

4073--Zadvar-Veet association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Zadvar	Veet	1	2	3	4
Galleta	HIJA	5-20	5-25	---	5-25	---	5-15
Needlegrass	STIPA	5-15	5-15	---	5-15	---	2-10
Indian ricegrass	ORHY	5-10	5-15	X	5-15	---	5-10
Dropseed	SPORO	---	5-10	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	X	1- 5	---	1- 5
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-15	5-20	X	5-20	10-25	10-20
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	---	1- 5
Perennial forbs	PPFF	3- 8	3-10	X	3-10	2- 5	5-10
Annual forbs	AAFF	2- 5	2- 5	---	2- 5	2- 5	2- 5
Black sagebrush	ARARN	20-25	---	X	---	---	---
Bud sagebrush	ARSP5	5-10	5-10	---	5-10	---	---
Winterfat	EULA5	2- 5	2-10	---	2-10	---	2- 5
Nevada ephedra	EPNE	2- 5	---	X	---	---	2- 5
Wyoming big sagebrush	ARTRW	---	15-20	X	15-20	---	15-20
Spiny hopsage	GRSP	---	5-10	---	5-10	10-20	2- 5
Green ephedra	EPVI	---	---	X	---	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRS9	---	---	---	---	10-30	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	X	10-20	5-15	10-25
Utah juniper	JUOS	---	---	X	---	---	---
Singleleaf pinyon	PIMO	---	---	X	---	---	---

Range site number	029X008N	029X049N	029X081N	029X049N	027X029N	029X006N
Potential production (lb/acre):						
Favorable years	700	900	125	900	800	800
Normal years	400	600	75	600	500	500
Unfavorable years	200	300	25	300	100	300

4080--Truvar-Crunker association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Truvar	Crunker	1
Galleta	HIJA	5-15	5-25	5-25
Indian ricegrass	ORHY	5-10	5-15	5-15
Needlegrass	STIPA	2-10	5-15	5-15
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5
Dropseed	SPORO	---	5-10	5-10
Other perennial grasses	PPGG	10-20	5-20	5-20
Annual grasses	AAGG	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	3-10	3-10
Annual forbs	AAFF	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	15-20
Fourwing saltbush	ATCA2	5-10	---	---
Nevada ephedra	EPNE	2- 5	---	---
Winterfat	EULA5	2- 5	2-10	2-10
Spiny hopsage	GRSP	2- 5	5-10	5-10
Bud sagebrush	ARSP5	---	5-10	5-10
Other shrubs	SSSS	10-25	10-20	10-20
Range site number		029X006N	029X049N	029X049N
Potential production (lb/acre):				
Favorable years		800	900	900
Normal years		500	600	600
Unfavorable years		300	300	300

4081--Truvar-Fadoll association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Truvar	Fadoll	1
Galleta	HIJA	5-15	5-25	5-25
Indian ricegrass	ORHY	5-10	5-15	5-15
Needlegrass	STIPA	2-10	5-15	5-15
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5
Dropseed	SPORO	---	5-10	5-10
Other perennial grasses	PPGG	10-20	5-20	5-20
Annual grasses	AAGG	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	3-10	3-10
Annual forbs	AAFF	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	15-20
Fourwing saltbush	ATCA2	5-10	---	---
Nevada ephedra	EPNE	2- 5	---	---
Winterfat	EULA5	2- 5	2-10	2-10
Spiny hopsage	GRSP	2- 5	5-10	5-10
Bud sagebrush	ARSP5	---	5-10	5-10
Other shrubs	SSSS	10-25	10-20	10-20

Range site number	029X006N	029X049N	029X049N
Potential production (lb/acre):			
Favorable years	800	900	900
Normal years	500	600	600
Unfavorable years	300	300	300

## 4090--Eaglepass-Rock outcrop complex, 30 to 75 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Eaglepass	Rock outcrop	1	2	3
Indian ricegrass	ORHY	2- 5	---	5-10	2- 5	5-10
Galleta	HIJA	---	---	5-15	10-20	---
Needlegrass	STIPA	---	---	2-10	5-10	---
Bluegrass	POA++	---	---	2-10	---	---
Bottlebrush squirreltail	SIHY	---	---	1- 5	---	---
Other perennial grasses	PPGG	1- 3	---	10-15	5-10	5-10
Annual grasses	AAGG	1- 3	---	1- 5	1- 5	2- 4
Perennial forbs	PPFF	1- 4	---	5-10	5-10	2- 6
Annual forbs	AAFF	1- 3	---	1- 5	2- 5	1- 5
Littleleaf mountainmahogany	CELEI2	50-75	---	---	---	---
Nevada greasewood	GLNE	10-20	---	---	---	---
Black sagebrush	ARARN	1-10	---	15-20	---	---
Wyoming big sagebrush	ARTRW	1- 5	---	---	---	---
Nevada ephedra	EPNE	---	---	5-10	5-10	2- 5
Bud sagebrush	ARSP5	---	---	2- 5	2- 5	---
Winterfat	EULA5	---	---	2- 5	---	---
Spiny menodora	MESP2	---	---	---	10-25	---
Bailey greasewood	SAVEB	---	---	---	5-10	2-10
Anderson wolfberry	LYAN	---	---	---	5-10	---
Shadscale	ATCO	---	---	---	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	5-15
Burrobrush	HYMEN3	---	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	---	5-10
Cooper wolfberry	LYCO2	---	---	---	---	2- 5
Other shrubs	SSSS	5-15	---	10-20	15-25	10-20
Range site number		029X040N	None	029X014N	029X037N	029X041N
Potential production (lb/acre):						
Favorable years		350	---	500	300	500
Normal years		250	---	300	200	300
Unfavorable years		150	---	100	100	100

4100--Stumble loamy sand, 2 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Stumble	1	2	3	4
Indian ricegrass	ORHY	30-50	30-50	5-10	15-25	5-10
Needleandthread	STCO4	2-10	2-10	---	10-15	---
Bottlebrush squirreltail	SIHY	---	---	5-10	---	---
Inland saltgrass	DIST	---	---	2- 5	---	---
Galleta	HIJA	---	---	---	---	---
Needlegrass	STIPA	---	---	---	---	---
Dropseed	SPORO	---	---	---	---	---
Other perennial grasses	PPGG	2-10	2-10	2- 5	---	5-10
Annual grasses	AAGG	---	---	---	---	2- 4
Perennial forbs	PPFF	2- 5	2- 5	3- 7	2- 5	2- 6
Annual forbs	AAFF	2- 5	2- 5	---	2- 5	1- 5
Fourwing saltbush	ATCA2	5-15	5-15	---	10-20	5-15
Winterfat	EULA5	2-10	2-10	---	---	---
Nevada dalea	DAPO2	2-10	2-10	---	5-10	---
Shadscale	ATCO	---	---	20-40	---	---
Black greasewood	SAVE4	---	---	5-20	---	---
Seepweed	SUAED	---	---	5-15	---	---
Bailey greasewood	SAVEB	---	---	2-10	---	2-10
Bud sagebrush	ARSP5	---	---	2-10	---	---
Hairy horsebrush	TECO2	---	---	---	30-40	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25
Burrobrush	HYMEN3	---	---	---	---	5-10
Nevada ephedra	EPNE	---	---	---	---	2- 5
Cooper wolfberry	LYCO2	---	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	---	---	---	---	---
Spiny hopsage	GRSP	---	---	---	---	---
Other shrubs	SSSS	5-10	5-10	3- 7	5-10	10-20

Range site number	027X009N	027X009N	027X024N	027X023N	029X041N
Potential production (lb/acre):					
Favorable years	800	800	600	300	500
Normal years	450	450	400	200	300
Unfavorable years	200	200	200	100	100

## 4102--Stumble loamy fine sand, 4 to 15 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Stumble	1	2	3	4
Indian ricegrass	ORHY	30-50	30-50	30-50	15-25	5-10
Needleandthread	STCO4	2-10	2-10	2-10	10-15	---
Galleta	HIJA	---	---	---	---	---
Other perennial grasses	PPGG	2-10	2-10	2-10	---	5-10
Annual grasses	AAGG	---	---	---	---	2- 4
Perennial forbs	PPFF	2- 5	2- 5	2- 5	2- 5	2- 6
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	1- 5
Fourwing saltbush	ATCA2	5-15	5-15	5-15	10-20	5-15
Winterfat	EULA5	2-10	2-10	2-10	---	---
Nevada dalea	DAPO2	2-10	2-10	2-10	5-10	---
Hairy horsebrush	TECO2	---	---	---	30-40	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25
Burrobrush	HYMEN3	---	---	---	---	5-10
Bailey greasewood	SAVEB	---	---	---	---	2-10
Nevada ephedra	EPNE	---	---	---	---	2- 5
Cooper wolfberry	LYCO2	---	---	---	---	2- 5
Spiny menodora	MESP2	---	---	---	---	---
Shadscale	ATCO	---	---	---	---	---
Bud sagebrush	ARSP5	---	---	---	---	---
Other shrubs	SSSS	5-10	5-10	5-10	5-10	10-20
Range site number		027X009N	027X009N	027X009N	027X023N	029X041N
Potential production (lb/acre):						
Favorable years		800	800	800	300	500
Normal years		450	450	450	200	300
Unfavorable years		200	200	200	100	100

4103--Stumble-Stumble, sodic loamy fine sands, 0 to 8 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Stumble	Stumble, sodic	1	2	3	4
Indian ricegrass	ORHY	30-50	10-20	5-10	---	---	---
Needleandthread	STCO4	2-10	5-10	---	---	---	---
Bottlebrush squirreltail	SIHY	---	---	5-10	5-10	5-10	---
Inland saltgrass	DIST	---	---	2- 5	---	---	X
Basin wildrye	ELCI2	---	---	---	15-25	15-25	---
Alkali sacaton	SPAI	---	---	---	5-10	5-10	---
Sedge	CAREX	---	---	---	---	---	X
Alkali muhly	MUAS	---	---	---	---	---	X
Desert needlegrass	STSP3	---	---	---	---	---	X
Other perennial grasses	PPGG	2-10	2- 5	2- 5	5-10	5-10	---
Perennial forbs	PPFF	2- 5	2- 5	3- 7	5-10	5-10	---
Annual forbs	AAFF	2- 5	2- 5	---	2- 5	2- 5	---
Fourwing saltbush	ATCA2	5-15	---	---	2- 5	2- 5	X
Winterfat	EULA5	2-10	---	---	---	---	---
Nevada dalea	DAPO2	2-10	---	---	---	---	---
Black greasewood	SAVE4	---	10-40	5-20	5-15	5-15	---
Shadscale	ATCO	---	---	20-40	2- 5	2- 5	---
Seepweed	SUAED	---	---	5-15	---	---	---
Bailey greasewood	SAVEB	---	---	2-10	---	---	---
Bud sagebrush	ARSP5	---	---	2-10	---	---	---
Torrey quailbush	ATTO	---	---	---	40-60	40-60	---
Nevada ephedra	EPNE	---	---	---	---	---	X
Cooper wolfberry	LYCO2	---	---	---	---	---	X
Burrobrush	HYMEN3	---	---	---	---	---	X
Knapp brickellbush	BRKN	---	---	---	---	---	X
Other shrubs	SSSS	5-10	5-20	3- 7	5-10	5-10	---

Range site number	027X009N	027X016N	027X024N	027X041N	027X041N	Variable
Potential production (lb/acre):						
Favorable years	800	300	600	1,500	1,500	500
Normal years	450	200	400	1,000	1,000	300
Unfavorable years	200	50	200	600	600	100

## 4110--Fadoll loamy sand, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Fadoll	1	2
Wheatgrass	AGROP2	2- 5	2- 5	---
Indian ricegrass	ORHY	10-20	10-20	15-25
Needleandthread	STCO4	10-30	10-30	10-15
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---
Other perennial grasses	PPGG	5-10	5-10	---
Perennial forbs	PPFF	2- 5	2- 5	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 5
Big sagebrush	ARTR2	10-20	10-20	---
Spiny hopsage	GRSP	5-10	5-10	---
Hairy horsebrush	TECO2	---	---	30-40
Fourwing saltbush	ATCA2	---	---	10-20
Nevada dalea	DAPO2	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	5-10
Other shrubs	SSSS	5-10	5-10	5-10
Range site number		027X045N	027X045N	027X023N
Potential production (lb/acre):				
Favorable years		700	700	300
Normal years		500	500	200
Unfavorable years		400	400	100

4121--Brawley very stony fine sandy loam, 15 to 50 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Brawley	1	2	3	4
Western needlegrass	STOC2	X	---	---	---	---
Pine bluegrass	POSC	X	---	---	---	---
Indian ricegrass	ORHY	X	---	---	---	---
Bottlebrush squirreltail	SIHY	X	X	---	---	---
Thurber needlegrass	STTH2	---	X	---	---	---
Ricegrass	ORYZO	---	X	---	---	---
Letterman needlegrass	STLE4	---	---	---	10-25	---
Bluegrass	POA++	---	---	---	5-10	---
Prairie junegrass	KOCR	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	5-15
Wheatgrass	AGROP2	---	---	---	---	5-15
Western needlegrass	STCO2	---	---	---	---	5-10
Sedge	CAREX	---	---	---	---	1- 4
Other perennial grasses	PPGG	X	X	---	10-15	3-10
Perennial forbs	PPFF	X	X	---	5-15	5-15
Mountain big sagebrush	ARTRV	X	---	---	---	---
Antelope bitterbrush	PUTR2	X	X	---	---	1- 5
Green ephedra	EPVI	X	X	---	---	---
Low sagebrush	ARAR8	---	X	---	20-30	---
Basin big sagebrush	ARTRT	---	---	---	---	10-15
Rubber rabbitbrush	CHNA2	---	---	---	---	2- 5
Serviceberry	AMELA	---	---	---	---	1- 4
Other shrubs	SSSS	X	X	---	5-15	10-20
Singleleaf pinyon	PIMO	X	X	---	---	---
Utah juniper	JUOS	X	X	---	---	---
Other trees	TTTT	---	---	---	---	5-10

Range site number	026X060N	026X064N	None	026X028N	029X026N
Potential production (lb/acre):					
Favorable years	300	325	---	350	1,500
Normal years	225	225	---	250	1,000
Unfavorable years	150	150	---	150	800

4130--Penelas-Rodad-Gabbvally association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Penelas	Rodad	Gabbvally	1	2	3	4
Galleta	HIJA	5-15	10-20	5-15	---	10-20	5-15	---
Indian ricegrass	ORHY	5-10	2- 5	5-10	---	2- 5	5-10	---
Needlegrass	STIPA	2-10	5-10	5-10	---	5-10	5-10	---
Bottlebrush squirreltail	SIHY	1- 5	---	1- 5	---	---	1- 5	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	5-10	5-20	---	5-10	5-20	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	5-10	4-10	---	5-10	4-10	2- 5
Annual forbs	AAFF	1- 5	2- 5	2- 7	---	2- 5	2- 7	2- 5
Black sagebrush	ARARN	15-20	---	---	---	---	---	---
Nevada ephedra	EPNE	5-10	5-10	5-10	---	5-10	5-10	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	2- 5	---	---
Winterfat	EULA5	2- 5	---	---	---	---	---	---
Spiny menodora	MESP2	---	10-25	---	---	10-25	---	---
Bailey greasewood	SAVEB	---	5-10	---	---	5-10	---	---
Anderson wolfberry	LYAN	---	5-10	---	---	5-10	---	---
Shadscale	ATCO	---	2- 5	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	20-30	---	---	20-30	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	---	10-20
Other shrubs	SSSS	10-20	15-25	10-20	---	15-25	10-20	5-15

Range site number	029X014N	029X037N	029X010N	None	029X037N	029X010N	027X029N
Potential production (lb/acre):							
Favorable years	500	300	600	---	300	600	800
Normal years	300	200	400	---	200	400	500
Unfavorable years	100	100	200	---	100	200	100

4150--Stewval-Lomoine association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Stewval	Lomoine	1	2	3	4
Galleta	HIJA	5-15	---	---	5-15	---	---
Indian ricegrass	ORHY	5-10	---	X	5-10	---	---
Needlegrass	STIPA	2-10	---	---	5-10	---	---
Bluegrass	POA++	2-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	X	1- 4	---	---
Desert needlegrass	STSP3	---	5-10	---	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-15	10-25	X	5-20	10-25	---
Annual grasses	AAGG	1- 5	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	2- 5	X	4-10	2- 5	---
Annual forbs	AAFF	1- 5	---	---	2- 7	2- 5	---
Black sagebrush	ARARN	15-20	20-40	X	---	---	---
Nevada ephedra	EPNE	5-10	2- 5	X	5-10	---	---
Bud sagebrush	ARSP5	2- 5	---	---	---	---	---
Winterfat	EULA5	2- 5	---	---	---	---	---
Bailey greasewood	SAVEB	---	5-15	---	---	---	---
Wyoming big sagebrush	ARTRW	---	---	X	20-30	---	---
Green ephedra	EPVI	---	---	X	---	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRY9	---	---	---	---	10-30	---
Spiny hopsage	GRSP	---	---	---	---	10-20	---
Other shrubs	SSSS	10-20	5-15	X	10-20	5-15	---
Utah juniper	JUOS	---	---	X	---	---	---
Singleleaf pinyon	PIMO	---	---	X	---	---	---

Range site number	029X014N	027X061N	029X081N	029X010N	027X029N	None
Potential production (lb/acre):						
Favorable years	500	200	125	600	800	---
Normal years	300	100	75	400	500	---
Unfavorable years	100	50	25	200	100	---

4152--Stewval-Pintwater-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Stewval	Pintwater	Rock outcrop	1	2	3	4
Galleta	HIJA	5-15	10-20	---	5-15	---	10-20	---
Indian ricegrass	ORHY	5-10	2- 5	---	5-10	2- 5	2- 5	5-10
Needlegrass	STIPA	2-10	5-10	---	5-10	---	5-10	---
Bluegrass	POA++	2-10	---	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	1- 4	1- 2	---	---
King desertgrass	BLKI	---	---	---	---	1- 2	---	---
Other perennial grasses	PPGG	10-15	5-10	---	5-20	1- 5	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	1- 5	1- 5	2- 4
Perennial forbs	PPFF	5-10	5-10	---	4-10	2- 5	5-10	2- 6
Annual forbs	AAFF	1- 5	2- 5	---	2- 7	1- 5	2- 5	1- 5
Black sagebrush	ARARN	15-20	---	---	---	---	---	---
Nevada ephedra	EPNE	5-10	5-10	---	5-10	---	5-10	2- 5
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	2- 5	2- 5	---
Winterfat	EULA5	2- 5	---	---	---	---	---	---
Spiny menodora	MESP2	---	10-25	---	---	---	10-25	---
Bailey greasewood	SAVEB	---	5-10	---	---	10-15	5-10	2-10
Anderson wolfberry	LYAN	---	5-10	---	---	---	5-10	---
Shadscale	ATCO	---	2- 5	---	---	40-60	2- 5	---
Wyoming big sagebrush	ARTRW	---	---	---	20-30	---	---	---
Nevada dalea	DAPO2	---	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---	2- 5
Rubber rabbitbrush	CHNA2	---	---	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	---	---	5-15
Burrobrush	HYMEN3	---	---	---	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	15-25	---	10-20	5-15	15-25	10-20
Range site number		029X014N	029X037N	None	029X010N	029X033N	029X037N	029X041N
Potential production (lb/acre):								
Favorable years		500	300	---	600	100	300	500
Normal years		300	200	---	400	50	200	300
Unfavorable years		100	100	---	200	25	100	100

4153--Stewval very gravelly sandy loam, 8 to 50 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Stewval	1	2	3	4
Galleta	HIJA	5-15	---	10-20	5-15	---
Indian ricegrass	ORHY	5-10	---	2- 5	5-10	---
Needlegrass	STIPA	2-10	---	5-10	5-10	5-15
Bluegrass	POA++	2-10	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	1- 4	---
Pine bluegrass	POSC	---	---	---	---	20-30
Other perennial grasses	PPGG	10-15	---	5-10	5-20	5-15
Annual grasses	AAGG	1- 5	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	---	5-10	4-10	5-10
Annual forbs	AAFF	1- 5	---	2- 5	2- 7	---
Black sagebrush	ARARN	15-20	---	---	---	---
Nevada ephedra	EPNE	5-10	---	5-10	5-10	5-10
Bud sagebrush	ARSP5	2- 5	---	2- 5	---	---
Winterfat	EULA5	2- 5	---	---	---	---
Spiny menodora	MESP2	---	---	10-25	---	---
Bailey greasewood	SAVEB	---	---	5-10	---	---
Anderson wolfberry	LYAN	---	---	5-10	---	---
Shadscale	ATCO	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	---	20-30	10-20
Spiny hopsage	GRSP	---	---	---	---	5-15
Other shrubs	SSSS	10-20	---	15-25	10-20	5-10
Range site number		029X014N	None	029X037N	029X010N	027X007N
Potential production (lb/acre):						
Favorable years		500	---	300	600	600
Normal years		300	---	200	400	450
Unfavorable years		100	---	100	200	300

4154--Stewval, very steep-Stewval-Gabbvally association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Stewval, very steep	Stewval	Gabbvally	1	2	3	4
Galleta	HIJA	5-15	5-15	5-15	---	---	---	---
Indian ricegrass	ORHY	5-10	5-10	5-10	---	---	---	X
Needlegrass	STIPA	2-10	2-10	5-10	5-15	---	---	---
Bluegrass	POA++	2-10	2-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 4	---	---	---	X
Pine bluegrass	POSC	---	---	---	20-30	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-15	10-15	5-20	5-15	---	10-25	X
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	---	---	---
Perennial forbs	PPFF	5-10	5-10	4-10	5-10	---	2- 5	X
Annual forbs	AAFF	1- 5	1- 5	2- 7	---	---	2- 5	---
Black sagebrush	ARARN	15-20	15-20	---	---	---	---	X
Nevada ephedra	EPNE	5-10	5-10	5-10	5-10	---	---	X
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	---	---	---
Winterfat	EULA5	2- 5	2- 5	---	---	---	---	---
Wyoming big sagebrush	ARTRW	---	---	20-30	10-20	---	---	X
Spiny hopsage	GRSP	---	---	---	5-15	---	10-20	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	---	---	---	10-30	---
Green ephedra	EPVI	---	---	---	---	---	---	X
Other shrubs	SSSS	10-20	10-20	10-20	5-10	---	5-15	X
Utah juniper	JUOS	---	---	---	---	---	---	X
Singleleaf pinyon	PIMO	---	---	---	---	---	---	X
Range site number		029X014N	029X014N	029X010N	027X007N	None	027X029N	029X081N
Potential production (lb/acre):								
Favorable years		500	500	600	600	---	800	125
Normal years		300	300	400	450	---	500	75
Unfavorable years		100	100	200	300	---	100	25

4155--Stewval-Kyler association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Stewval	Kyler	1	2	3	4
Galleta	HIJA	5-15	5-15	5-15	5-15	10-20	---
Indian ricegrass	ORHY	5-10	5-10	5-10	5-10	2- 5	2- 5
Needlegrass	STIPA	2-10	2-10	2-10	2-10	5-10	---
Bluegrass	POA++	2-10	2-10	2-10	2-10	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5	1- 5	---	---
Other perennial grasses	PPGG	10-15	10-15	10-15	10-15	5-10	1- 3
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	1- 3
Perennial forbs	PPFF	5-10	5-10	5-10	5-10	5-10	1- 4
Annual forbs	AAFF	1- 5	1- 5	1- 5	1- 5	2- 5	1- 3
Black sagebrush	ARARN	15-20	15-20	15-20	15-20	---	1-10
Nevada ephedra	EPNE	5-10	5-10	5-10	5-10	5-10	---
Bud sagebrush	ARSP5	2- 5	2- 5	2- 5	2- 5	2- 5	---
Winterfat	EULA5	2- 5	2- 5	2- 5	2- 5	---	---
Spiny menodora	MESP2	---	---	---	---	10-25	---
Bailey greasewood	SAVEB	---	---	---	---	5-10	---
Anderson wolfberry	LYAN	---	---	---	---	5-10	---
Shadscale	ATCO	---	---	---	---	2- 5	---
Littleleaf mountainmahogany	CELEI2	---	---	---	---	---	50-75
Nevada greasewood	GLNE	---	---	---	---	---	10-20
Wyoming big sagebrush	ARTRW	---	---	---	---	---	1- 5
Other shrubs	SSSS	10-20	10-20	10-20	10-20	15-25	5-15
Range site number		029X014N	029X014N	029X014N	029X014N	029X037N	029X040N
Potential production (lb/acre):							
Favorable years		500	500	500	500	300	350
Normal years		300	300	300	300	200	250
Unfavorable years		100	100	100	100	100	150

4156--Stewval-Beelem association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Stewval	Beelem	1	2	3	4
Galleta	HIJA	5-15	---	---	5-15	5-20	---
Indian ricegrass	ORHY	5-10	X	---	5-10	5-10	---
Needlegrass	STIPA	2-10	---	---	2-10	5-15	---
Bluegrass	POA++	2-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	X	---	1- 5	---	---
Desert needlegrass	STSP3	---	---	5-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	X	10-25	10-20	10-15	10-25
Annual grasses	AAGG	1- 5	---	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	X	2- 5	5-10	3- 8	2- 5
Annual forbs	AAFF	1- 5	---	---	2- 5	2- 5	2- 5
Black sagebrush	ARARN	15-20	X	20-40	---	20-25	---
Nevada ephedra	EPNE	5-10	X	2- 5	2- 5	2- 5	---
Bud sagebrush	ARSP5	2- 5	---	---	---	5-10	---
Winterfat	EULA5	2- 5	---	---	2- 5	2- 5	---
Wyoming big sagebrush	ARTRW	---	X	---	15-20	---	---
Green ephedra	EPVI	---	X	---	---	---	---
Bailey greasewood	SAVEB	---	---	5-15	---	---	---
Fourwing saltbush	ATCA2	---	---	---	5-10	---	---
Spiny hopsage	GRSP	---	---	---	2- 5	---	10-20
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	X	5-15	10-25	10-20	5-15
Utah juniper	JUOS	---	X	---	---	---	---
Singleleaf pinyon	PIMO	---	X	---	---	---	---

Range site number	029X014N	029X081N	027X061N	029X006N	029X008N	027X029N
Potential production (lb/acre):						
Favorable years	500	125	200	800	700	800
Normal years	300	75	100	500	400	500
Unfavorable years	100	25	50	300	200	100

4157--Stewval-Bellehelen-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Stewval	Bellehelen	Rock outcrop	1	2	3	4
Galleta	HIJA	5-15	---	---	5-15	5-15	---	---
Indian ricegrass	ORHY	5-10	---	---	5-10	5-10	---	---
Needlegrass	STIPA	2-10	X	---	5-10	2-10	X	---
Bluegrass	POA++	2-10	---	---	---	2-10	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	1- 4	1- 5	---	X
Pine bluegrass	POSC	---	X	---	---	---	X	X
Other perennial grasses	PPGG	10-15	X	---	5-20	10-15	X	X
Annual grasses	AAGG	1- 5	---	---	1- 5	1- 5	---	---
Perennial forbs	PPFF	5-10	X	---	4-10	5-10	X	X
Annual forbs	AAFF	1- 5	---	---	2- 7	1- 5	---	---
Black sagebrush	ARARN	15-20	X	---	---	15-20	X	---
Nevada ephedra	EPNE	5-10	---	---	5-10	5-10	---	---
Bud sagebrush	ARSP5	2- 5	---	---	---	2- 5	---	---
Winterfat	EULA5	2- 5	---	---	---	2- 5	---	---
Douglas rabbitbrush	CHVI8	---	X	---	---	---	X	---
Green ephedra	EPVI	---	X	---	---	---	X	X
Wyoming big sagebrush	ARTRW	---	---	---	20-30	---	---	X
Mountain big sagebrush	ARTRV	---	---	---	---	---	---	X
Other shrubs	SSSS	10-20	X	---	10-20	10-20	X	X
Singleleaf pinyon	PIMO	---	---	---	---	---	---	X
Utah juniper	JUOS	---	---	---	---	---	---	X
Other trees	TTTT	---	X	---	---	---	X	---

Range site number	029X014N	029X082N	None	029X010N	029X014N	029X082N	026X062N
Potential production (lb/acre):							
Favorable years	500	200	---	600	500	200	250
Normal years	300	125	---	400	300	125	200
Unfavorable years	100	50	---	200	100	50	150

## 4159--Stewval-Gabbvally-Tejabe association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Stewval	Gabbvally	Tejabe	1	2	3	4
Galleta	HIJA	5-15	5-15	---	---	5-15	---	---
Indian ricegrass	ORHY	5-10	5-10	---	---	5-10	5-10	---
Needlegrass	STIPA	2-10	5-10	5-15	---	2-10	---	---
Bluegrass	POA++	2-10	---	---	---	2-10	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 4	---	---	1- 5	2- 5	---
Pine bluegrass	POSC	---	---	20-30	---	---	---	---
Desert needlegrass	STSP3	---	---	---	---	---	20-30	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	10-15	5-20	5-15	---	10-15	2- 5	10-25
Annual grasses	AAGG	1- 5	1- 5	---	---	1- 5	---	---
Perennial forbs	PPFF	5-10	4-10	5-10	---	5-10	5-10	2- 5
Annual forbs	AAFF	1- 5	2- 7	---	---	1- 5	---	2- 5
Black sagebrush	ARARN	15-20	---	---	---	15-20	---	---
Nevada ephedra	EPNE	5-10	5-10	5-10	---	5-10	---	---
Bud sagebrush	ARSP5	2- 5	---	---	---	2- 5	---	---
Winterfat	EULA5	2- 5	---	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	20-30	10-20	---	---	---	10-20
Spiny hopsage	GRSP	---	---	5-15	---	---	---	10-20
Littleleaf horsebrush	TEGL	---	---	---	---	---	10-20	---
Shadscale	ATCO	---	---	---	---	---	5-15	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRS9	---	---	---	---	---	---	10-30
Other shrubs	SSSS	10-20	10-20	5-10	---	10-20	5-15	5-15
Range site number		029X014N	029X010N	027X007N	None	029X014N	027X017N	027X029N
Potential production (lb/acre):								
Favorable years		500	600	600	---	500	400	800
Normal years		300	400	450	---	300	200	500
Unfavorable years		100	200	300	---	100	100	100

4161--Terlco-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Terlco	Izo	1	2
Indian ricegrass	ORHY	5-20	5-10	30-50	10-20
Galleta	HIJA	5-10	---	---	---
Bottlebrush squirreltail	SIHY	---	---	---	5-10
Other perennial grasses	PPGG	5-10	5-10	2- 5	5-10
Annual grasses	AAGG	1- 5	2- 4	---	---
Globemallow	SPHAE	---	---	1- 3	---
Birdcage eveningprimrose	OEDE2	---	---	1- 3	---
Other perennial forbs	PPFF	5-10	2- 6	2- 5	3- 7
Annual forbs	AAFF	2- 5	1- 5	---	2- 5
Spiny menodora	MESP2	10-30	---	---	---
Bailey greasewood	SAVEB	5-15	2-10	---	5-10
Shadscale	ATCO	5-15	---	---	10-20
Bud sagebrush	ARSP5	5-10	---	---	---
Nevada ephedra	EPNE	5-10	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Fourwing saltbush	ATCA2	---	5-15	15-30	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Cooper wolfberry	LYCO2	---	2- 5	10-20	5-20
Nevada dalea	DAPO2	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	5-15	5-15
Range site number		029X036N	029X041N	027X060N	027X043N
Potential production (lb/acre):					
Favorable years		400	500	400	400
Normal years		300	300	200	200
Unfavorable years		100	100	100	100

4162--Terlco-Annaw-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Terlco	Annaw	Izo	1	2	3
Indian ricegrass	ORHY	5-20	5-20	5-10	2- 5	5-15	5-20
Galleta	HIJA	5-10	5-10	---	---	5-20	5-10
King desertgrass	BLKI	---	---	---	1- 2	---	---
Bottlebrush squirreltail	SIHY	---	---	---	1- 2	2- 5	---
Needlegrass	STIPA	---	---	---	---	5-10	---
Other perennial grasses	PPGG	5-10	5-10	5-10	1- 5	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 6	2- 5	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	1- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	10-30	---	---	---	10-30
Bailey greasewood	SAVEB	5-15	5-15	2-10	10-15	5-15	5-15
Shadscale	ATCO	5-15	5-15	---	40-60	15-25	5-15
Bud sagebrush	ARSP5	5-10	5-10	---	2- 5	2- 5	5-10
Nevada ephedra	EPNE	5-10	5-10	2- 5	---	2- 5	5-10
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	2- 5	---	---
Nevada dalea	DAPO2	---	---	---	5-10	---	---
Other shrubs	SSSS	10-20	10-20	10-20	5-15	10-20	10-20
Range site number		029X036N	029X036N	029X041N	029X033N	029X022N	029X036N
Potential production (lb/acre):							
Favorable years		400	400	500	100	300	400
Normal years		300	300	300	50	200	300
Unfavorable years		100	100	100	25	100	100

4163--Terlco-Izo association, moderately steep

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Terlco	Izo	1	2	3
Indian ricegrass	ORHY	5-20	5-20	5-10	---	2- 5
Galleta	HIJA	5-10	5-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	2- 5	---
King desertgrass	BLKI	---	---	---	---	1- 2
Bottlebrush squirreltail	SIHY	---	---	---	---	1- 2
Other perennial grasses	PPGG	5-10	5-10	5-10	10-25	1- 5
Annual grasses	AAGG	1- 5	1- 5	2- 4	---	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 6	2- 5	2- 5
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	1- 5
Spiny menodora	MESP2	10-30	10-30	---	---	---
Bailey greasewood	SAVEB	5-15	5-15	2-10	---	10-15
Shadscale	ATCO	5-15	5-15	---	---	40-60
Bud sagebrush	ARSP5	5-10	5-10	---	---	2- 5
Nevada ephedra	EPNE	5-10	5-10	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	2- 5
Big sagebrush	ARTR2	---	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	---	10-30	---
Spiny hopsage	GRSP	---	---	---	10-20	---
Nevada dalea	DAPO2	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	10-20	5-15	5-15

Range site number	029X036N	029X036N	029X041N	027X029N	029X033N
Potential production (lb/acre):					
Favorable years	400	400	500	800	100
Normal years	300	300	300	500	50
Unfavorable years	100	100	100	100	25

## 4165--Terlco-Wardenot-Roic association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Terlco	Wardenot	Roic	1	2
Indian ricegrass	ORHY	5-20	5-20	2- 5	5-10	---
Galleta	HIJA	5-10	5-10	---	---	---
King desertgrass	BLKI	---	---	1- 2	---	---
Bottlebrush squirreltail	SIHY	---	---	1- 2	---	---
Other perennial grasses	PPGG	5-10	5-10	1- 5	5-10	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	---
Perennial forbs	PPFF	5-10	5-10	2- 5	2- 6	---
Annual forbs	AAFF	2- 5	2- 5	1- 5	1- 5	---
Spiny menodora	MESP2	10-30	10-30	---	---	---
Bailey greasewood	SAVEB	5-15	5-15	10-15	2-10	---
Shadscale	ATCO	5-15	5-15	40-60	---	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	---
Nevada ephedra	EPNE	5-10	5-10	---	2- 5	---
Nevada dalea	DAPO2	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	5-15	10-20	---
Range site number		029X036N	029X036N	029X033N	029X041N	None
Potential production (lb/acre):						
Favorable years		400	400	100	500	---
Normal years		300	300	50	300	---
Unfavorable years		100	100	25	100	---

4166--Terlco, dry-Wardenot-Roic association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Terlco	Wardenot	Roic	1	2	3
Galleta	HIJA	10-25	10-25	---	5-20	---	---
Indian ricegrass	ORHY	5-10	5-10	2- 5	5-10	5-10	---
Bottlebrush squirreltail	SIHY	2- 5	2- 5	1- 2	---	---	---
Needlegrass	STIPA	2- 5	2- 5	---	2- 5	---	---
Dropseed	SPORO	2- 5	2- 5	---	5-15	---	---
King desertgrass	BLKI	---	---	1- 2	---	---	---
Other perennial grasses	PPGG	5-15	5-15	1- 5	5-10	5-10	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	2- 4	---
Perennial forbs	PPFF	4-10	4-10	2- 5	5- 7	2- 6	---
Annual forbs	AAFF	1- 5	1- 5	1- 5	2- 4	1- 5	---
Shadscale	ATCO	10-25	10-25	40-60	---	---	---
Bailey greasewood	SAVEB	5-10	5-10	10-15	---	2-10	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	5-10	---	---
Winterfat	EULA5	5-10	5-10	---	5-20	---	---
Nevada ephedra	EPNE	1- 5	1- 5	---	---	2- 5	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	2- 5	---
Fourwing saltbush	ATCA2	---	---	---	10-15	5-15	---
Spiny hopsage	GRSP	---	---	---	2- 8	---	---
Anderson wolfberry	LYAN	---	---	---	1- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	5-15	10-25	10-20	---

Range site number	029X017N	029X017N	029X033N	029X046N	029X041N	None
Potential production (lb/acre):						
Favorable years	350	350	100	450	500	---
Normal years	250	250	50	350	300	---
Unfavorable years	100	100	25	175	100	---

## 4170--Downeyville-Blacktop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Downeyville	Blacktop	1	2	3	4
Galleta	HIJA	5-20	---	---	10-25	---	---
Indian ricegrass	ORHY	5-15	2- 5	---	5-10	---	5-10
Needlegrass	STIPA	5-10	---	---	2- 5	---	---
Bottlebrush squirreltail	SIHY	2- 5	1- 2	---	2- 5	2-10	---
King desertgrass	BLKI	---	1- 2	---	---	---	---
Dropseed	SPORO	---	---	---	2- 5	---	---
Bluegrass	POA++	---	---	---	---	10-30	---
Other perennial grasses	PPGG	5-10	1- 5	---	5-15	2-10	5-10
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	---	2- 4
Perennial forbs	PPFF	5-10	2- 5	---	4-10	5-10	2- 6
Annual forbs	AAFF	2- 5	1- 5	---	1- 5	---	1- 5
Shadscale	ATCO	15-25	40-60	---	10-25	10-20	---
Bailey greasewood	SAVEB	5-15	10-15	---	5-10	5-10	2-10
Nevada ephedra	EPNE	2- 5	---	---	1- 5	---	2- 5
Bud sagebrush	ARSP5	2- 5	2- 5	---	5-10	5-10	---
Nevada dalea	DAPO2	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	---	2- 5
Winterfat	EULA5	---	---	---	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	---	5-15
Burrobrush	HYMEN3	---	---	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-10
Other shrubs	SSSS	10-20	5-15	---	10-20	5-15	10-20
Range site number		029X022N	029X033N	None	029X017N	027X030N	029X041N
Potential production (lb/acre):							
Favorable years		300	100	---	350	400	500
Normal years		200	50	---	250	300	300
Unfavorable years		100	25	---	100	200	100

4171--Downeyville-Hawsley association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Downeyville	Hawsley	1	2	3
Indian ricegrass	ORHY	30-50	30-50	5-15	15-25	---
Needleandthread	STCO4	2-10	2-10	---	10-15	---
Galleta	HIJA	---	---	5-20	---	---
Needlegrass	STIPA	---	---	5-10	---	---
Bottlebrush squirreltail	SIHY	---	---	2- 5	---	---
Other perennial grasses	PPGG	2-10	2-10	5-10	---	---
Annual grasses	AAGG	---	---	1- 5	---	---
Perennial forbs	PPFF	2- 5	2- 5	5-10	2- 5	---
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	---
Fourwing saltbush	ATCA2	5-15	5-15	---	10-20	---
Winterfat	EULA5	2-10	2-10	---	---	---
Nevada dalea	DAPO2	2-10	2-10	---	5-10	---
Shadscale	ATCO	---	---	15-25	---	---
Bailey greasewood	SAVEB	---	---	5-15	---	---
Nevada ephedra	EPNE	---	---	2- 5	---	---
Bud sagebrush	ARSP5	---	---	2- 5	---	---
Hairy horsebrush	TECO2	---	---	---	30-40	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---
Other shrubs	SSSS	5-10	5-10	10-20	5-10	---

Range site number	027X009N	027X009N	029X022N	027X023N	None
Potential production (lb/acre):					
Favorable years	800	800	300	300	---
Normal years	450	450	200	200	---
Unfavorable years	200	200	100	100	---

## 4173--Downeyville-Stewval-Rock outcrop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Downeyville	Stewval	Rock outcrop	1	2	3
Galleta	HIJA	10-20	5-15	---	5-15	---	---
Indian ricegrass	ORHY	2- 5	5-10	---	5-10	5-10	2- 5
Needlegrass	STIPA	5-10	2-10	---	2-10	---	---
Bluegrass	POA++	---	2-10	---	2-10	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	---	1- 5	---	1- 2
King desertgrass	BLKI	---	---	---	---	---	1- 2
Other perennial grasses	PPGG	5-10	10-15	---	10-15	5-10	1- 5
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	2- 4	1- 5
Perennial forbs	PPFF	5-10	5-10	---	5-10	2- 6	2- 5
Annual forbs	AAFF	2- 5	1- 5	---	1- 5	1- 5	1- 5
Nevada ephedra	EPNE	5-10	5-10	---	5-10	2- 5	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	2- 5	---	2- 5
Spiny menodora	MESP2	10-25	---	---	---	---	---
Bailey greasewood	SAVEB	5-10	---	---	---	2-10	10-15
Anderson wolfberry	LYAN	5-10	---	---	---	---	---
Shadscale	ATCO	2- 5	---	---	---	---	40-60
Black sagebrush	ARARN	---	15-20	---	15-20	---	---
Winterfat	EULA5	---	2- 5	---	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	2- 5
Nevada dalea	DAPO2	---	---	---	---	---	5-10
Other shrubs	SSSS	15-25	10-20	---	10-20	10-20	5-15
Range site number		029X037N	029X014N	None	029X014N	029X041N	029X033N
Potential production (lb/acre):							
Favorable years		300	500	---	500	500	100
Normal years		200	300	---	300	300	50
Unfavorable years		100	100	---	100	100	25

4174--Downeyville-Stewval-Mirkwood association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Downeyville	Stewval	Mirkwood	1	2	3	4
Galleta	HIJA	10-20	5-15	---	---	---	5-10	---
Indian ricegrass	ORHY	2- 5	5-10	5-10	---	5-10	5-20	---
Needlegrass	STIPA	5-10	2-10	---	5-15	---	---	---
Bluegrass	POA++	---	2-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 5	2- 5	---	---	---	---
Desert needlegrass	STSP3	---	---	20-30	---	---	---	---
Sandberg bluegrass	POSE	---	---	2- 5	---	---	---	---
Pine bluegrass	POSC	---	---	---	20-30	---	---	---
Other perennial grasses	PPGG	5-10	10-15	2- 5	5-15	5-10	5-10	---
Annual grasses	AAGG	1- 5	1- 5	---	---	2- 4	1- 5	---
Perennial forbs	PPFF	5-10	5-10	5-10	5-10	2- 6	5-10	---
Annual forbs	AAFF	2- 5	1- 5	---	---	1- 5	2- 5	---
Nevada ephedra	EPNE	5-10	5-10	---	5-10	2- 5	5-10	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	---	5-10	---
Spiny menodora	MESP2	10-25	---	---	---	---	10-30	---
Bailey greasewood	SAVEB	5-10	---	---	---	2-10	5-15	---
Anderson wolfberry	LYAN	5-10	---	---	---	---	---	---
Shadscale	ATCO	2- 5	---	5-15	---	---	5-15	---
Black sagebrush	ARARN	---	15-20	---	---	---	---	---
Winterfat	EULA5	---	2- 5	---	---	---	---	---
Littleleaf horsebrush	TEGL	---	---	10-20	---	5-10	---	---
Wyoming big sagebrush	ARTRW	---	---	---	10-20	---	---	---
Spiny hopsage	GRSP	---	---	---	5-15	---	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---	---
Other shrubs	SSSS	15-25	10-20	5-15	5-10	10-20	10-20	---

Range site number	029X037N	029X014N	027X017N	027X007N	029X041N	029X036N	None
Potential production (lb/acre):							
Favorable years	300	500	400	600	500	400	---
Normal years	200	300	200	450	300	300	---
Unfavorable years	100	100	100	300	100	100	---

4175--Downeyville, moist-Downeyville-Blacktop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Downeyville, moist	Downeyville	Blacktop	1	2	3	4
Galleta	HIJA	10-20	5-20	---	---	5-10	---	---
Indian ricegrass	ORHY	2- 5	5-15	2- 5	---	5-20	5-10	---
Needlegrass	STIPA	5-10	5-10	---	---	---	---	---
Bottlebrush squirreltail	SIHY	---	2- 5	1- 2	2-10	---	---	---
King desertgrass	BLKI	---	---	1- 2	---	---	---	---
Bluegrass	POA++	---	---	---	10-30	---	---	---
Other perennial grasses	PPGG	5-10	5-10	1- 5	2-10	5-10	5-10	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	2- 4	---
Perennial forbs	PPFF	5-10	5-10	2- 5	5-10	5-10	2- 6	---
Annual forbs	AAFF	2- 5	2- 5	1- 5	---	2- 5	1- 5	---
Nevada ephedra	EPNE	5-10	2- 5	---	---	5-10	2- 5	---
Bud sagebrush	ARSP5	2- 5	2- 5	2- 5	5-10	5-10	---	---
Spiny menodora	MESP2	10-25	---	---	---	10-30	---	---
Bailey greasewood	SAVEB	5-10	5-15	10-15	5-10	5-15	2-10	---
Anderson wolfberry	LYAN	5-10	---	---	---	---	---	---
Shadscale	ATCO	2- 5	15-25	40-60	10-20	5-15	---	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---	2- 5	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	10-25	---
Fourwing saltbush	ATCA2	---	---	---	---	---	5-15	---
Burrobrush	HYMEN3	---	---	---	---	---	5-10	---
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-10	---
Other shrubs	SSSS	15-25	10-20	5-15	5-15	10-20	10-20	---
Range site number		029X037N	029X022N	029X033N	027X030N	029X036N	029X041N	None
Potential production (lb/acre):								
Favorable years		300	300	100	400	400	500	---
Normal years		200	200	50	300	300	300	---
Unfavorable years		100	100	25	200	100	100	---

4176--Downeyville, moist-Downeyville-Gabbvally association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Downeyville, moist	Downeyville	Gabbvally	1	2	3	4
Galleta	HIJA	10-20	5-20	5-15	---	5-10	5-15	---
Indian ricegrass	ORHY	2- 5	5-15	5-10	---	5-20	5-10	---
Needlegrass	STIPA	5-10	5-10	5-10	---	---	2-10	---
Bottlebrush squirreltail	SIHY	---	2- 5	1- 4	---	---	1- 5	---
Bluegrass	POA++	---	---	---	---	---	2-10	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	5-10	5-10	5-20	---	5-10	10-15	10-25
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	5-10	4-10	---	5-10	5-10	2- 5
Annual forbs	AAFF	2- 5	2- 5	2- 7	---	2- 5	1- 5	2- 5
Nevada ephedra	EPNE	5-10	2- 5	5-10	---	5-10	5-10	---
Bud sagebrush	ARSP5	2- 5	2- 5	---	---	5-10	2- 5	---
Spiny menodora	MESP2	10-25	---	---	---	10-30	---	---
Bailey greasewood	SAVEB	5-10	5-15	---	---	5-15	---	---
Anderson wolfberry	LYAN	5-10	---	---	---	---	---	---
Shadscale	ATCO	2- 5	15-25	---	---	5-15	---	---
Wyoming big sagebrush	ARTRW	---	---	20-30	---	---	---	---
Black sagebrush	ARARN	---	---	---	---	---	15-20	---
Winterfat	EULA5	---	---	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	---	10-20
Other shrubs	SSSS	15-25	10-20	10-20	---	10-20	10-20	5-15

Range site number	029X037N	029X022N	029X010N	None	029X036N	029X014N	027X029N
Potential production (lb/acre):							
Favorable years	300	300	600	---	400	500	800
Normal years	200	200	400	---	300	300	500
Unfavorable years	100	100	200	---	100	100	100

4177--Downeyville-Mirkwood-Nemico association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Downeyville	Mirkwood	Nemico	1	2	3	4
Galleta	HIJA	5-20	---	30-50	10-25	---	5-25	---
Indian ricegrass	ORHY	5-15	5-10	5-15	5-10	5-10	5-15	---
Needlegrass	STIPA	5-10	---	---	2- 5	---	5-15	---
Bottlebrush squirreltail	SIHY	2- 5	2- 5	---	2- 5	---	1- 5	---
Desert needlegrass	STSP3	---	20-30	---	---	---	---	---
Sandberg bluegrass	POSE	---	2- 5	---	---	---	---	---
Dropseed	SPORO	---	---	---	2- 5	---	5-10	---
Other perennial grasses	PPGG	5-10	2- 5	5-15	5-15	5-10	5-20	---
Annual grasses	AAGG	1- 5	---	---	1- 5	2- 4	1- 5	---
Perennial forbs	PPFF	5-10	5-10	5-10	4-10	2- 6	3-10	---
Annual forbs	AAFF	2- 5	---	---	1- 5	1- 5	2- 5	---
Shadscale	ATCO	15-25	5-15	5-15	10-25	---	---	---
Bailey greasewood	SAVEB	5-15	---	5-10	5-10	---	---	---
Nevada ephedra	EPNE	2- 5	---	---	1- 5	2- 5	---	---
Bud sagebrush	ARSP5	2- 5	---	---	5-10	---	5-10	---
Littleleaf horsebrush	TEGL	---	10-20	---	---	5-10	---	---
Winterfat	EULA5	---	---	---	5-10	---	2-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	---	---	---	---	15-20	---
Spiny hopsage	GRSP	---	---	---	---	---	5-10	---
Other shrubs	SSSS	10-20	5-15	5-15	10-20	10-20	10-20	---
Range site number		029X022N	027X017N	027X015N	029X017N	029X041N	029X049N	None
Potential production (lb/acre):								
Favorable years		300	400	500	350	500	900	---
Normal years		200	200	350	250	300	600	---
Unfavorable years		100	100	200	100	100	300	---

4178--Downeyville-Stewval-Blacktop association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Downeyville	Stewval	Blacktop	1	2	3
Indian ricegrass	ORHY	5-20	5-20	2- 5	5-10	---	---
Galleta	HIJA	5-10	5-10	---	---	---	---
King desertgrass	BLKI	---	---	1- 2	---	---	---
Bottlebrush squirreltail	SIHY	---	---	1- 2	---	---	---
Other perennial grasses	PPGG	5-10	5-10	1- 5	5-10	---	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	---	---
Perennial forbs	PPFF	5-10	5-10	2- 5	2- 6	---	---
Annual forbs	AAFF	2- 5	2- 5	1- 5	1- 5	---	---
Spiny menodora	MESP2	10-30	10-30	---	---	---	---
Bailey greasewood	SAVEB	5-15	5-15	10-15	2-10	---	---
Shadscale	ATCO	5-15	5-15	40-60	---	---	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	---	---
Nevada ephedra	EPNE	5-10	5-10	---	2- 5	---	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Other shrubs	SSSS	10-20	10-20	5-15	10-20	---	---
Range site number		029X036N	029X036N	029X033N	029X041N	None	None
Potential production (lb/acre):							
Favorable years		400	400	100	500	---	---
Normal years		300	300	50	300	---	---
Unfavorable years		100	100	25	100	---	---

4180--Candelaria-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Candelaria	Izo	1	2	3	4
Indian ricegrass	ORHY	5-20	5-20	2- 5	5-10	---	---
Galleta	HIJA	5-10	5-10	---	---	---	---
King desertgrass	BLKI	---	---	1- 2	---	---	---
Bottlebrush squirreltail	SIHY	---	---	1- 2	---	---	---
Other perennial grasses	PPGG	5-10	5-10	1- 5	5-10	---	---
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	---	---
Perennial forbs	PPFF	5-10	5-10	2- 5	2- 6	---	---
Annual forbs	AAFF	2- 5	2- 5	1- 5	1- 5	---	---
Spiny menodora	MESP2	10-30	10-30	---	---	---	---
Bailey greasewood	SAVEB	5-15	5-15	10-15	2-10	---	---
Shadscale	ATCO	5-15	5-15	40-60	---	---	---
Bud sagebrush	ARSP5	5-10	5-10	2- 5	---	---	---
Nevada ephedra	EPNE	5-10	5-10	---	2- 5	---	---
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Other shrubs	SSSS	10-20	10-20	5-15	10-20	---	---
Range site number		029X036N	029X036N	029X033N	029X041N	None	None
Potential production (lb/acre):							
Favorable years		400	400	100	500	---	---
Normal years		300	300	50	300	---	---
Unfavorable years		100	100	25	100	---	---

4181--Candelaria-Wardenot-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Candelaria	Wardenot	Izo	1	2	3
Indian ricegrass	ORHY	5-20	5-20	5-10	10-20	2- 5	5-20
Galleta	HIJA	5-10	5-10	---	---	10-20	5-10
Bottlebrush squirreltail	SIHY	---	---	---	5-10	---	---
Needlegrass	STIPA	---	---	---	---	5-10	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	2- 4	---	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	2- 6	3- 7	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	10-30	---	---	10-25	10-30
Bailey greasewood	SAVEB	5-15	5-15	2-10	5-10	5-10	5-15
Shadscale	ATCO	5-15	5-15	---	10-20	2- 5	5-15
Bud sagebrush	ARSP5	5-10	5-10	---	---	2- 5	5-10
Nevada ephedra	EPNE	5-10	5-10	2- 5	---	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	5-20	---	---
Anderson wolfberry	LYAN	---	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	10-20	5-15	15-25	10-20

Range site number	029X036N	029X036N	029X041N	027X043N	029X037N	029X036N
Potential production (lb/acre):						
Favorable years	400	400	500	400	300	400
Normal years	300	300	300	200	200	300
Unfavorable years	100	100	100	100	100	100

## 4182--Candelaria-Gynelle-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Candelaria	Gynelle	Izo	1	2
Galleta	HIJA	10-25	---	---	10-25	---
Indian ricegrass	ORHY	5-10	10-20	5-10	5-10	2- 5
Bottlebrush squirreltail	SIHY	2- 5	5-10	---	2- 5	1- 2
Needlegrass	STIPA	2- 5	---	---	2- 5	---
Dropseed	SPORO	2- 5	---	---	2- 5	---
King desertgrass	BLKI	---	---	---	---	1- 2
Other perennial grasses	PPGG	5-15	5-10	5-10	5-15	1- 5
Annual grasses	AAGG	1- 5	---	2- 4	1- 5	1- 5
Perennial forbs	PPFF	4-10	3- 7	2- 6	4-10	2- 5
Annual forbs	AAFF	1- 5	2- 5	1- 5	1- 5	1- 5
Shadscale	ATCO	10-25	10-20	---	10-25	40-60
Bailey greasewood	SAVEB	5-10	5-10	2-10	5-10	10-15
Bud sagebrush	ARSP5	5-10	---	---	5-10	2- 5
Winterfat	EULA5	5-10	---	---	5-10	---
Nevada ephedra	EPNE	1- 5	---	2- 5	1- 5	---
Cooper wolfberry	LYCO2	---	5-20	2- 5	---	2- 5
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Nevada dalea	DAPO2	---	---	---	---	5-10
Other shrubs	SSSS	10-20	5-15	10-20	10-20	5-15
Range site number		029X017N	027X043N	029X041N	029X017N	029X033N
Potential production (lb/acre):						
Favorable years		350	400	500	350	100
Normal years		250	200	300	250	50
Unfavorable years		100	100	100	100	25

4183--Candelaria-Izo, rarely flooded, association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Candelaria	Izo	1	2	3
Galleta	HIJA	10-25	5-10	5-10	---	---
Indian ricegrass	ORHY	5-10	5-20	5-20	2- 5	5-10
Bottlebrush squirreltail	SIHY	2- 5	---	---	1- 2	---
Needlegrass	STIPA	2- 5	---	---	---	---
Dropseed	SPORO	2- 5	---	---	---	---
King desertgrass	BLKI	---	---	---	1- 2	---
Other perennial grasses	PPGG	5-15	5-10	5-10	1- 5	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	2- 4
Perennial forbs	PPFF	4-10	5-10	5-10	2- 5	2- 6
Annual forbs	AAFF	1- 5	2- 5	2- 5	1- 5	1- 5
Shadscale	ATCO	10-25	5-15	5-15	40-60	---
Bailey greasewood	SAVEB	5-10	5-15	5-15	10-15	2-10
Bud sagebrush	ARSP5	5-10	5-10	5-10	2- 5	---
Winterfat	EULA5	5-10	---	---	---	---
Nevada ephedra	EPNE	1- 5	5-10	5-10	---	2- 5
Spiny menodora	MESP2	---	10-30	10-30	---	---
Nevada dalea	DAPO2	---	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	2- 5	2- 5
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	5-15
Burrobrush	HYMEN3	---	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	---	5-10
Other shrubs	SSSS	10-20	10-20	10-20	5-15	10-20

Range site number	029X017N	029X036N	029X036N	029X033N	029X041N
Potential production (lb/acre):					
Favorable years	350	400	400	100	500
Normal years	250	300	300	50	300
Unfavorable years	100	100	100	25	100

## 4184--Candelaria, dry-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Candelaria	Izo	1	2	3
Galleta	HIJA	10-25	---	---	10-25	10-25
Indian ricegrass	ORHY	5-10	5-10	10-20	5-10	5-10
Bottlebrush squirreltail	SIHY	2- 5	---	5-10	2- 5	2- 5
Needlegrass	STIPA	2- 5	---	---	2- 5	2- 5
Dropseed	SPORO	2- 5	---	---	2- 5	2- 5
Other perennial grasses	PPGG	5-15	5-10	5-10	5-15	5-15
Annual grasses	AAGG	1- 5	2- 4	---	1- 5	1- 5
Perennial forbs	PPFF	4-10	2- 6	3- 7	4-10	4-10
Annual forbs	AAFF	1- 5	1- 5	2- 5	1- 5	1- 5
Shadscale	ATCO	10-25	---	10-20	10-25	10-25
Bailey greasewood	SAVEB	5-10	2-10	5-10	5-10	5-10
Bud sagebrush	ARSP5	5-10	---	---	5-10	5-10
Winterfat	EULA5	5-10	---	---	5-10	5-10
Nevada ephedra	EPNE	1- 5	2- 5	---	1- 5	1- 5
Rubber rabbitbrush	CHNA2	---	10-25	---	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---	---
Burrobrush	HYMEN3	---	5-10	---	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	5-20	---	---
Other shrubs	SSSS	10-20	10-20	5-15	10-20	10-20
Range site number		029X017N	029X041N	027X043N	029X017N	029X017N
Potential production (lb/acre):						
Favorable years		350	500	400	350	350
Normal years		250	300	200	250	250
Unfavorable years		100	100	100	100	100

4185--Candelaria-Typic Torriorthents association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Candelaria	Typic Torriorthents	1	2	3	4
Indian ricegrass	ORHY	30-50	30-50	30-50	2- 5	5-10	30-50
King desertgrass	BLKI	---	---	---	1- 2	---	---
Bottlebrush squirreltail	SIHY	---	---	---	1- 2	2- 5	---
Galleta	HIJA	---	---	---	---	10-25	---
Needlegrass	STIPA	---	---	---	---	2- 5	---
Dropseed	SPORO	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	2- 5	2- 5	2- 5	1- 5	5-15	2- 5
Annual grasses	AAGG	---	---	---	1- 5	1- 5	---
Globemallow	SPHAE	1- 3	1- 3	1- 3	---	---	1- 3
Birdcage eveningprimrose	OEDE2	1- 3	1- 3	1- 3	---	---	1- 3
Other perennial forbs	PPFF	2- 5	2- 5	2- 5	2- 5	4-10	2- 5
Annual forbs	AAFF	---	---	---	1- 5	1- 5	---
Fourwing saltbush	ATCA2	15-30	15-30	15-30	---	---	15-30
Cooper wolfberry	LYCO2	10-20	10-20	10-20	2- 5	---	10-20
Nevada dalea	DAPO2	5-10	5-10	5-10	5-10	---	5-10
Shadscale	ATCO	---	---	---	40-60	10-25	---
Bailey greasewood	SAVEB	---	---	---	10-15	5-10	---
Bud sagebrush	ARSP5	---	---	---	2- 5	5-10	---
Winterfat	EULA5	---	---	---	---	5-10	---
Nevada ephedra	EPNE	---	---	---	---	1- 5	---
Other shrubs	SSSS	5-15	5-15	5-15	5-15	10-20	5-15
Range site number		027X060N	027X060N	027X060N	029X033N	029X017N	027X060N
Potential production (lb/acre):							
Favorable years		400	400	400	100	350	400
Normal years		200	200	200	50	250	200
Unfavorable years		100	100	100	25	100	100

4186--Candelaria-Roic-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Candelaria	Roic	Izo	1	2	3	4
Indian ricegrass	ORHY	5-20	2- 5	5-20	5-20	5-10	5-10	5-20
Galleta	HIJA	5-10	---	5-10	5-10	---	5-20	5-10
King desertgrass	BLKI	---	1- 2	---	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 2	---	---	---	---	---
Needlegrass	STIPA	---	---	---	---	---	5-15	---
Other perennial grasses	PPGG	5-10	1- 5	5-10	5-10	5-10	10-15	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	2- 5	5-10	5-10	2- 6	3- 8	5-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	2- 5	1- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	---	10-30	10-30	---	---	10-30
Bailey greasewood	SAVEB	5-15	10-15	5-15	5-15	2-10	---	5-15
Shadscale	ATCO	5-15	40-60	5-15	5-15	---	---	5-15
Bud sagebrush	ARSP5	5-10	2- 5	5-10	5-10	---	5-10	5-10
Nevada ephedra	EPNE	5-10	---	5-10	5-10	2- 5	2- 5	5-10
Nevada dalea	DAPO2	---	5-10	---	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	---	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---	---
Black sagebrush	ARARN	---	---	---	---	---	20-25	---
Winterfat	EULA5	---	---	---	---	---	2- 5	---
Other shrubs	SSSS	10-20	5-15	10-20	10-20	10-20	10-20	10-20

Range site number	029X036N	029X033N	029X036N	029X036N	029X041N	029X008N	029X036N
Potential production (lb/acre):							
Favorable years	400	100	400	400	500	700	400
Normal years	300	50	300	300	300	400	300
Unfavorable years	100	25	100	100	100	200	100



4189--Candelaria-Typic Torriorthents, very steep, association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Candelaria	Typic Torriorthents	1	2	3	4
Indian ricegrass	ORHY	5-20	2- 5	5-20	5-10	5-20	5-20
Galleta	HIJA	5-10	---	5-10	---	5-10	5-10
King desertgrass	BLKI	---	1- 2	---	---	---	---
Bottlebrush squirreltail	SIHY	---	1- 2	---	---	---	---
Needlegrass	STIPA	---	---	---	---	---	---
Other perennial grasses	PPGG	5-10	1- 5	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	2- 5	5-10	2- 6	5-10	5-10
Annual forbs	AAFF	2- 5	1- 5	2- 5	1- 5	2- 5	2- 5
Spiny menodora	MESP2	10-30	---	10-30	---	10-30	10-30
Bailey greasewood	SAVEB	5-15	10-15	5-15	2-10	5-15	5-15
Shadscale	ATCO	5-15	40-60	5-15	---	5-15	5-15
Bud sagebrush	ARSP5	5-10	2- 5	5-10	---	5-10	5-10
Nevada ephedra	EPNE	5-10	---	5-10	2- 5	5-10	5-10
Nevada dalea	DAPO2	---	5-10	---	---	---	---
Cooper wolfberry	LYCO2	---	2- 5	---	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Black sagebrush	ARARN	---	---	---	---	---	---
Winterfat	EULA5	---	---	---	---	---	---
Other shrubs	SSSS	10-20	5-15	10-20	10-20	10-20	10-20

Range site number	029X036N	029X033N	029X036N	029X041N	029X036N	029X036N
Potential production (lb/acre):						
Favorable years	400	100	400	500	400	400
Normal years	300	50	300	300	300	300
Unfavorable years	100	25	100	100	100	100

4190--Brier-Beelem-Wassit association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Brier	Beelem	Wassit	1	2	3
Pine bluegrass	POSC	X	---	X	10-20	X	---
Bottlebrush squirreltail	SIHY	X	X	X	---	X	---
Indian ricegrass	ORHY	---	X	X	---	---	---
Western needlegrass	STOC2	---	---	X	---	---	---
Thurber needlegrass	STTH2	---	---	---	5-15	---	---
Sandberg bluegrass	POSE	---	---	---	5-10	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	X	X	5-10	X	10-25
Perennial forbs	PPFF	X	X	X	5-10	X	2- 5
Annual forbs	AAFF	---	---	---	---	---	2- 5
Wyoming big sagebrush	ARTRW	X	X	---	---	X	---
Mountain big sagebrush	ARTRV	X	---	X	---	X	---
Green ephedra	EPVI	X	X	X	---	X	---
Black sagebrush	ARARN	---	X	---	---	---	---
Nevada ephedra	EPNE	---	X	---	---	---	---
Antelope bitterbrush	PUTR2	---	---	X	---	---	---
Low sagebrush	ARAR8	---	---	---	25-35	---	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	10-20
Other shrubs	SSSS	X	X	X	5-10	X	5-15
Singleleaf pinyon	PIMO	X	X	X	---	X	---
Utah juniper	JUOS	X	X	X	---	X	---

Range site number	026X062N	029X081N	026X060N	027X020N	026X062N	027X029N
Potential production (lb/acre):						
Favorable years	250	125	300	400	250	800
Normal years	200	75	225	200	200	500
Unfavorable years	150	25	150	100	150	100

4191--Brier-Brawley-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Brier	Brawley	Rock outcrop	1	2	3
Pine bluegrass	POSC	X	X	---	---	---	---
Bottlebrush squirreltail	SIHY	X	X	---	X	---	---
Western needlegrass	STOC2	---	X	---	-	---	20-40
Indian ricegrass	ORHY	---	X	---	X	---	---
Basin wildrye	ELCI2	---	---	---	---	5-15	5-15
Wheatgrass	AGROP2	---	---	---	---	5-15	---
Western needlegrass	STCO2	---	---	---	---	5-10	---
Sedge	CAREX	---	---	---	---	1- 4	---
Mountain brome	BRMA4	---	---	---	---	---	5-10
Other perennial grasses	PPGG	X	X	---	X	3-10	5-15
Perennial forbs	PPFF	X	X	---	X	5-15	10-20
Annual forbs	AAFF	---	---	---	---	---	5-10
Wyoming big sagebrush	ARTRW	X	---	---	X	---	---
Mountain big sagebrush	ARTRV	X	X	---	---	---	10-20
Green ephedra	EPVI	X	X	---	X	---	---
Antelope bitterbrush	PUTR2	---	X	---	---	1- 5	---
Black sagebrush	ARARN	---	---	---	X	---	---
Nevada ephedra	EPNE	---	---	---	X	---	---
Basin big sagebrush	ARTRT	---	---	---	---	10-15	---
Rubber rabbitbrush	CHNA2	---	---	---	---	2- 5	---
Serviceberry	AMELA	---	---	---	---	1- 4	---
Eriogonum	ERIOG	---	---	---	---	---	5-10
Other shrubs	SSSS	X	X	---	X	10-20	5-10
Singleleaf pinyon	PIMO	X	X	---	X	---	---
Utah juniper	JUOS	X	X	---	X	---	---
Other trees	TTTT	---	---	---	---	5-10	---

Range site number	026X062N	026X060N	None	029X081N	029X026N	026X038N
Potential production (lb/acre):						
Favorable years	250	300	---	125	1,500	1,500
Normal years	200	225	---	75	1,000	900
Unfavorable years	150	150	---	25	800	600

4192--Brier-Katyblay-Hiridge association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Brier	Katyblay	Hiridge	1	2	3
Pine bluegrass	POSC	X	---	---	---	---	---
Bottlebrush squirreltail	SIHY	X	---	---	---	---	---
Western needlegrass	STOC2	---	20-40	---	20-35	---	---
Basin wildrye	ELCI2	---	5-15	---	10-20	---	X
Mountain brome	BRMA4	---	5-10	---	10-20	---	X
Letterman needlegrass	STLE4	---	---	10-25	---	---	---
Bluegrass	POA++	---	---	5-10	5-10	---	---
Prairie junegrass	KOCR	---	---	2- 5	---	---	---
Wheatgrass	AGROP2	---	---	---	---	---	X
Nevada bluegrass	PONE3	---	---	---	---	---	X
Other perennial grasses	PPGG	X	5-15	10-15	5-15	---	X
Perennial forbs	PPFF	X	10-20	5-15	5-15	---	X
Annual forbs	AAFF	---	5-10	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	X	---	---	---	---	---
Mountain big sagebrush	ARTRV	X	10-20	---	5-10	---	X
Green ephedra	EPVI	X	---	---	---	---	---
Eriogonum	ERIOG	---	5-10	---	---	---	---
Low sagebrush	ARAR8	---	---	20-30	---	---	---
Antelope bitterbrush	PUTR2	---	---	---	5-15	---	---
Snowberry	SYMPH	---	---	---	---	---	X
Other shrubs	SSSS	X	5-10	5-15	5-15	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---	---
Utah juniper	JUOS	X	---	---	---	---	---
Quaking aspen	POTR5	---	---	---	---	---	X

Range site number	026X062N	026X038N	026X028N	026X005N	None	026X066N
Potential production (lb/acre):						
Favorable years	250	1,500	350	1,500	---	3,000
Normal years	200	900	250	1,100	---	2,500
Unfavorable years	150	600	150	800	---	2,000

4200--Sonoma silt loam

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Sonoma	1	2	3
Alkali sacaton	SPAI	15-40	15-40	20-30	15-40
Inland saltgrass	DIST	10-15	10-15	10-20	10-15
Baltic rush	JUBA	5-15	5-15	5-10	5-15
Basin wildrye	ELCI2	2- 5	2- 5	5-15	2- 5
Common reed	PHCO15	2- 5	2- 5	---	2- 5
Alkali cordgrass	SPGR	2- 5	2- 5	---	2- 5
Creeping wildrye	ELTR3	---	---	5-10	---
Other perennial grasses	PPGG	10-20	10-20	5-10	10-20
Annual grasses	AAGG	2- 6	2- 6	---	2- 6
Perennial forbs	PPFF	2- 6	2- 6	5-10	2- 6
Annual forbs	AAFF	1- 5	1- 5	2- 5	1- 5
Black greasewood	SAVE4	---	---	5-10	---
Iodinebush	ALOC2	---	---	2- 5	---
Seepweed	SUAED	---	---	2- 5	---
Other shrubs	SSSS	2-10	2-10	5-10	2-10
Trees	TTTT	---	---	5-10	---
Range site number		029X002N	029X002N	027X005N	029X002N
Potential production (lb/acre):					
Favorable years		3,300	3,300	2,000	3,300
Normal years		2,200	2,200	1,500	2,200
Unfavorable years		1,000	1,000	1,000	1,000

4210--Sagouspe sand, frequently flooded, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Sagouspe	1	2	3	4
Alkali sacaton	SPAI	15-40	20-30	15-40	---	15-40
Inland saltgrass	DIST	10-15	10-20	10-15	---	10-15
Baltic rush	JUBA	5-15	5-10	5-15	---	5-15
Basin wildrye	ELCI2	2- 5	5-15	2- 5	---	2- 5
Common reed	PHCO15	2- 5	---	2- 5	---	2- 5
Alkali cordgrass	SPGR	2- 5	---	2- 5	---	2- 5
Creeping wildrye	ELTR3	---	5-10	---	---	---
Indian ricegrass	ORHY	---	---	---	10-20	---
Needleandthread	STCO4	---	---	---	5-10	---
Other perennial grasses	PPGG	10-20	5-10	10-20	2- 5	10-20
Annual grasses	AAGG	2- 6	---	2- 6	---	2- 6
Perennial forbs	PPFF	2- 6	5-10	2- 6	2- 5	2- 6
Annual forbs	AAFF	1- 5	2- 5	1- 5	2- 5	1- 5
Black greasewood	SAVE4	---	5-10	---	10-40	---
Iodinebush	ALOC2	---	2- 5	---	---	---
Seepweed	SUAED	---	2- 5	---	---	---
Other shrubs	SSSS	2-10	5-10	2-10	5-20	2-10
Trees	TTTT	---	5-10	---	---	---

Range site number	029X002N	027X005N	029X002N	027X016N	029X002N
Potential production (lb/acre):					
Favorable years	3,300	2,000	3,300	300	3,300
Normal years	2,200	1,500	2,200	200	2,200
Unfavorable years	1,000	1,000	1,000	50	1,000

## 4211--Sagouspe sand, drained, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Sagouspe	1	2
Basin wildrye	ELCI2	15-25	---	15-25
Alkali sacaton	SPAI	5-10	---	5-10
Bottlebrush squirreltail	SIHY	5-10	2-10	5-10
Indian ricegrass	ORHY	---	5-10	---
Creeping wildrye	ELTR3	---	---	---
Western wheatgrass	AGSM	---	---	---
Slender wheatgrass	AGTR	---	---	---
Inland saltgrass	DIST	---	---	---
Other perennial grasses	PPGG	5-10	5-10	5-10
Perennial forbs	PPFF	5-10	2- 5	5-10
Annual forbs	AAFF	2- 5	5-15	2- 5
Torrey quailbush	ATTO	40-60	---	40-60
Black greasewood	SAVE4	5-15	2- 5	5-15
Fourwing saltbush	ATCA2	2- 5	5-10	2- 5
Shadscale	ATCO	2- 5	---	2- 5
Littleleaf horsebrush	TEGL	---	5-25	---
Rubber rabbitbrush	CHNA2	---	5-20	---
Bailey greasewood	SAVEB	---	5-20	---
Spiny hopsage	GRSP	---	5-20	---
Burrobrush	HYMEN3	---	5-10	---
Nevada ephedra	EPNE	---	2- 5	---
Basin big sagebrush	ARTRT	---	---	---
Other shrubs	SSSS	5-10	2- 5	5-10
Fremont cottonwood	POFR2	---	---	---
Range site number		027X041N	027X022N	027X041N
Potential production (lb/acre):				
Favorable years		1,500	400	1,500
Normal years		1,000	200	1,000
Unfavorable years		600	50	600

4212--Sagouspe sand, dry, 0 to 4 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Sagouspe	1	2	3
Indian ricegrass	ORHY	10-20	10-20	---	5-10
Needleandthread	STCO4	5-10	5-10	---	---
Inland saltgrass	DIST	---	---	X	---
Sedge	CAREX	---	---	X	---
Alkali muhly	MUAS	---	---	X	---
Desert needlegrass	STSP3	---	---	X	---
Bottlebrush squirreltail	SIHY	---	---	---	2-10
Other perennial grasses	PPGG	2- 5	2- 5	---	5-10
Perennial forbs	PPFF	2- 5	2- 5	---	2- 5
Annual forbs	AAFF	2- 5	2- 5	---	5-15
Black greasewood	SAVE4	10-40	10-40	---	2- 5
Fourwing saltbush	ATCA2	---	---	X	5-10
Nevada ephedra	EPNE	---	---	X	2- 5
Cooper wolfberry	LYCO2	---	---	X	---
Burrobrush	HYMEN3	---	---	X	5-10
Knapp brickellbush	BRKN	---	---	X	---
Littleleaf horsebrush	TEGL	---	---	---	5-25
Rubber rabbitbrush	CHNA2	---	---	---	5-20
Bailey greasewood	SAVEB	---	---	---	5-20
Spiny hopsage	GRSP	---	---	---	5-20
Other shrubs	SSSS	5-20	5-20	---	2- 5
Range site number		027X016N	027X016N	Variable	027X022N
Potential production (lb/acre):					
Favorable years		300	300	500	400
Normal years		200	200	300	200
Unfavorable years		50	50	100	50

## 4220--Patna-Hawsley sands, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Patna	Hawsley	1	2	3	4
Indian ricegrass	ORHY	10-20	30-50	---	10-20	15-25	---
Bottlebrush squirreltail	SIHY	5-10	---	---	5-10	---	---
Needleandthread	STCO4	---	2-10	---	---	10-15	---
Other perennial grasses	PPGG	5-10	2-10	---	5-10	---	---
Perennial forbs	PPFF	3- 7	2- 5	---	3- 7	2- 5	---
Annual forbs	AAFF	2- 5	2- 5	---	2- 5	2- 5	---
Shadscale	ATCO	15-30	---	---	10-20	---	---
Bailey greasewood	SAVEB	10-20	---	---	5-10	---	---
Bud sagebrush	ARSP5	5-15	---	---	---	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---	10-20	---
Winterfat	EULA5	---	2-10	---	---	---	---
Nevada dalea	DAPO2	---	2-10	---	---	5-10	---
Cooper wolfberry	LYCO2	---	---	---	5-20	---	---
Hairy horsebrush	TECO2	---	---	---	---	30-40	---
Littleleaf horsebrush	TEGL	---	---	---	---	5-10	---
Other shrubs	SSSS	5-10	5-10	---	5-15	5-10	---
Range site number		027X018N	027X009N	None	027X043N	027X023N	None
Potential production (lb/acre):							
Favorable years		500	800	---	400	300	---
Normal years		300	450	---	200	200	---
Unfavorable years		100	200	---	100	100	---

4221--Patna sand, 0 to 2 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Patna	1	2	3	4
Indian ricegrass	ORHY	10-20	10-20	10-20	5-10	---
Bottlebrush squirreltail	SIHY	5-10	5-10	5-10	2-10	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	---
Perennial forbs	PPFF	3- 7	3- 7	3- 7	2- 5	---
Annual forbs	AAFF	2- 5	2- 5	2- 5	5-15	---
Shadscale	ATCO	15-30	10-20	10-20	---	---
Bailey greasewood	SAVEB	10-20	5-10	5-10	5-20	---
Bud sagebrush	ARSP5	5-15	---	---	---	---
Cooper wolfberry	LYCO2	---	5-20	5-20	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-25	---
Rubber rabbitbrush	CHNA2	---	---	---	5-20	---
Spiny hopsage	GRSP	---	---	---	5-20	---
Burrobrush	HYMEN3	---	---	---	5-10	---
Fourwing saltbush	ATCA2	---	---	---	5-10	---
Nevada ephedra	EPNE	---	---	---	2- 5	---
Black greasewood	SAVE4	---	---	---	2- 5	---
Other shrubs	SSSS	5-10	5-15	5-15	2- 5	---

Range site number	027X018N	027X043N	027X043N	027X022N	None
Potential production (lb/acre):					
Favorable years	500	400	400	400	---
Normal years	300	200	200	200	---
Unfavorable years	100	100	100	50	---

## 4230--Typic Torriorthents-Patna-Badland association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Typic Torriorthents	Patna	Badland	1	2	3	4
Indian ricegrass	ORHY	10-20	10-20	---	5-20	30-50	---	10-20
Bottlebrush squirreltail	SIHY	5-10	5-10	---	---	---	---	5-10
Desert needlegrass	STSP3	---	---	---	2-10	---	---	---
Needleandthread	STCO4	---	---	---	---	2-10	---	---
Creeping wildrye	ELTR3	---	---	---	---	---	X	---
Basin wildrye	ELCI2	---	---	---	---	---	X	---
Western wheatgrass	AGSM	---	---	---	---	---	X	---
Slender wheatgrass	AGTR	---	---	---	---	---	X	---
Inland saltgrass	DIST	---	---	---	---	---	X	---
Other perennial grasses	PPGG	5-10	5-10	---	2- 5	2-10	X	5-10
Perennial forbs	PFFF	3- 7	3- 7	---	5-10	2- 5	X	3- 7
Annual forbs	AAFF	2- 5	2- 5	---	---	2- 5	---	2- 5
Shadscale	ATCO	10-20	15-30	---	10-20	---	---	15-30
Cooper wolfberry	LYCO2	5-20	---	---	---	---	---	---
Bailey greasewood	SAVEB	5-10	10-20	---	5-15	---	---	10-20
Bud sagebrush	ARSP5	---	5-15	---	2-10	---	---	5-15
Nevada ephedra	EPNE	---	---	---	2- 5	---	---	---
Fourwing saltbush	ATCA2	---	---	---	---	5-15	---	---
Winterfat	EULA5	---	---	---	---	2-10	---	---
Nevada dalea	DAPO2	---	---	---	---	2-10	---	---
Basin big sagebrush	ARTRT	---	---	---	---	---	X	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	X	---
Other shrubs	SSSS	5-15	5-10	---	5-10	5-10	---	5-10
Fremont cottonwood	POFR2	---	---	---	---	---	X	---
Range site number		O27X043N	O27X018N	None	O27X027N	O27X009N	O27X002N	O27X018N
Potential production (lb/acre):								
Favorable years		400	500	---	200	800	3,000	500
Normal years		200	300	---	100	450	2,500	300
Unfavorable years		100	100	---	50	200	2,000	100

4240--Typic Torriorthents, 2 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Typic Torriorthents	1	2	3
Indian ricegrass	ORHY	10-20	5-20	---	5-10
Bottlebrush squirreltail	SIHY	5-10	---	---	2-10
Desert needlegrass	STSP3	---	2-10	---	---
Other perennial grasses	PPGG	5-10	2- 5	---	5-10
Perennial forbs	PPFF	3- 7	5-10	---	2- 5
Annual forbs	AAFF	2- 5	---	---	5-15
Shadscale	ATCO	10-20	10-20	---	---
Cooper wolfberry	LYCO2	5-20	---	---	---
Bailey greasewood	SAVEB	5-10	5-15	---	5-20
Bud sagebrush	ARSP5	---	2-10	---	---
Nevada ephedra	EPNE	---	2- 5	---	2- 5
Littleleaf horsebrush	TEGL	---	---	---	5-25
Rubber rabbitbrush	CHNA2	---	---	---	5-20
Spiny hopsage	GRSP	---	---	---	5-20
Burrobrush	HYMEN3	---	---	---	5-10
Fourwing saltbush	ATCA2	---	---	---	5-10
Black greasewood	SAVE4	---	---	---	2- 5
Other shrubs	SSSS	5-15	5-10	---	2- 5
Range site number		027X043N	027X027N	None	027X022N
Potential production (lb/acre):					
Favorable years		400	200	---	400
Normal years		200	100	---	200
Unfavorable years		100	50	---	50

## 4250--Bango-Hawsley complex, 0 to 4 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Bango	Hawsley	1	2	3	4
Indian ricegrass	ORHY	10-20	30-50	10-20	15-25	5-20	---
Bottlebrush squirreltail	SIHY	5-10	---	5-10	---	---	---
Needleandthread	STCO4	---	2-10	---	10-15	---	---
Desert needlegrass	STSP3	---	---	---	---	2-10	---
Other perennial grasses	PPGG	5-10	2-10	5-10	---	2- 5	---
Perennial forbs	PPFF	3- 7	2- 5	3- 7	2- 5	5-10	---
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	---	---
Shadscale	ATCO	10-20	---	15-30	---	10-20	---
Cooper wolfberry	LYCO2	5-20	---	---	---	---	---
Bailey greasewood	SAVEB	5-10	---	10-20	---	5-15	---
Fourwing saltbush	ATCA2	---	5-15	---	10-20	---	---
Winterfat	EULA5	---	2-10	---	---	---	---
Nevada dalea	DAPO2	---	2-10	---	5-10	---	---
Bud sagebrush	ARSP5	---	---	5-15	---	2-10	---
Hairy horsebrush	TECO2	---	---	---	30-40	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Nevada ephedra	EPNE	---	---	---	---	2- 5	---
Other shrubs	SSSS	5-15	5-10	5-10	5-10	5-10	---
Range site number		027X043N	027X009N	027X018N	027X023N	027X027N	None
Potential production (lb/acre):							
Favorable years		400	800	500	300	200	---
Normal years		200	450	300	200	100	---
Unfavorable years		100	200	100	100	50	---

5010--Mopana-Nire association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name		Inclusion number--
		Mopana	Nire	1
Letterman needlegrass	STLE4	10-25	---	---
Bluegrass	POA++	5-10	5-10	---
Prairie junegrass	KOCR	2- 5	---	---
Western needlegrass	STOC2	---	20-35	---
Mountain brome	BRMA4	---	10-20	---
Basin wildrye	ELCI2	---	10-20	---
Other perennial grasses	PPGG	10-15	5-15	---
Perennial forbs	PPFF	5-15	5-15	---
Annual forbs	AAFF	---	2- 5	---
Low sagebrush	ARAR8	20-30	---	---
Mountain big sagebrush	ARTRV	---	5-10	---
Antelope bitterbrush	PUTR2	---	5-15	---
Other shrubs	SSSS	5-15	5-15	---
Range site number		026X028N	026X005N	None
Potential production (lb/acre):				
Favorable years		350	1,500	---
Normal years		250	1,100	---
Unfavorable years		150	800	---

5011--Mopana-Holtle Variant association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Mopana	Holtle Variant	1	2	3
Letterman needlegrass	STLE4	10-25	---	---	---	---
Bluegrass	POA++	5-10	---	5-10	---	---
Prairie junegrass	KOCR	2- 5	---	---	---	---
Western needlegrass	STOC2	---	20-40	20-35	X	---
Basin wildrye	ELCI2	---	5-15	10-20	---	---
Mountain brome	BRMA4	---	5-10	10-20	---	---
Pine bluegrass	POSC	---	---	---	X	---
Indian ricegrass	ORHY	---	---	---	X	---
Bottlebrush squirreltail	SIHY	---	---	---	X	---
Other perennial grasses	PPGG	10-15	5-15	5-15	X	---
Perennial forbs	PPFF	5-15	10-20	5-15	X	---
Annual forbs	AAFF	---	5-10	2- 5	---	---
Low sagebrush	ARAR8	20-30	---	---	---	---
Mountain big sagebrush	ARTRV	---	10-20	5-10	X	---
Eriogonum	ERIOG	---	5-10	---	---	---
Antelope bitterbrush	PUTR2	---	---	5-15	X	---
Green ephedra	EPVI	---	---	---	X	---
Other shrubs	SSSS	5-15	5-10	5-15	X	---
Singleleaf pinyon	PIMO	---	---	---	X	---
Utah juniper	JUOS	---	---	---	X	---
Range site number		026X028N	026X038N	026X005N	026X060N	None
Potential production (lb/acre):						
Favorable years		350	1,500	1,500	300	---
Normal years		250	900	1,100	225	---
Unfavorable years		150	600	800	150	---

5050--Nire-Epvip-Hiridge association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Nire	Epvip	Hiridge	1	2	3
Western needlegrass	STOC2	20-35	15-40	---	---	---	---
Mountain brome	BRMA4	10-20	---	---	---	---	X
Basin wildrye	ELC12	10-20	5-15	---	---	2- 5	X
Bluegrass	POA++	5-10	---	5-10	---	---	---
Squirreltail	SITAN	---	5-10	---	---	---	---
Letterman needlegrass	STLE4	---	---	10-25	---	---	---
Prairie junegrass	KOCR	---	---	2- 5	---	---	---
Pine bluegrass	POSC	---	---	---	---	5-10	---
Wheatgrass	AGROP2	---	---	---	---	---	X
Nevada bluegrass	PONE3	---	---	---	---	---	X
Other perennial grasses	PPGG	5-15	5-15	10-15	---	2-10	X
Arrowleaf balsamroot	BASA3	---	---	---	---	2- 5	---
Other perennial forbs	PPFF	5-15	5-10	5-15	---	2-10	X
Annual forbs	AAFF	2- 5	---	---	---	---	---
Mountain big sagebrush	ARTRV	5-10	5-10	---	---	2- 5	X
Antelope bitterbrush	PUTR2	5-15	5-10	---	---	---	---
Green ephedra	EPVI	---	5- 8	---	---	---	---
Currant	RIBES	---	2- 5	---	---	---	---
Low sagebrush	ARAR8	---	---	20-30	---	---	---
Curleaf mountainmahogany	CELE3	---	---	---	---	45-65	---
Snowberry	SYMPH	---	---	---	---	2- 5	X
Other shrubs	SSSS	5-15	5-15	5-15	---	2-10	---
Quaking aspen	POTR5	---	---	---	---	---	X

Range site number	026X005N	026X048N	026X028N	None	026X009N	026X066N
Potential production (lb/acre):						
Favorable years	1,500	900	350	---	1,000	3,000
Normal years	1,100	700	250	---	800	2,500
Unfavorable years	800	450	150	---	600	2,000

## 5051--Nire stony fine sandy loam, 4 to 15 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Nire	1	2	3
Western needlegrass	STOC2	20-35	20-35	20-40	---
Mountain brome	BRMA4	10-20	10-20	5-10	---
Basin wildrye	ELCI2	10-20	10-20	5-15	---
Bluegrass	POA++	5-10	5-10	---	---
Other perennial grasses	PPGG	5-15	5-15	5-15	---
Perennial forbs	PPFF	5-15	5-15	10-20	---
Annual forbs	AAFF	2- 5	2- 5	5-10	---
Mountain big sagebrush	ARTRV	5-10	5-10	10-20	---
Antelope bitterbrush	PUTR2	5-15	5-15	---	---
Eriogonum	ERIOG	---	---	5-10	---
Other shrubs	SSSS	5-15	5-15	5-10	---
Range site number		026X005N	026X005N	026X038N	None
Potential production (lb/acre):					
Favorable years		1,500	1,500	1,500	---
Normal years		1,100	1,100	900	---
Unfavorable years		800	800	600	---

5052--Nire-Hiridge association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Nire	Hiridge	1	2	3	4
Western needlegrass	STOC2	20-35	---	20-35	---	20-40	20-35
Mountain brome	BRMA4	10-20	---	10-20	---	5-10	10-20
Basin wildrye	ELCI2	10-20	---	10-20	---	5-15	10-20
Bluegrass	POA++	5-10	5-10	5-10	---	---	5-10
Letterman needlegrass	STLE4	---	10-25	---	---	---	---
Prairie junegrass	KOCR	---	2- 5	---	---	---	---
Other perennial grasses	PPGG	5-15	10-15	5-15	---	5-15	5-15
Perennial forbs	PPFF	5-15	5-15	5-15	---	10-20	5-15
Annual forbs	AAFF	2- 5	---	2- 5	---	5-10	2- 5
Mountain big sagebrush	ARTRV	5-10	---	5-10	---	10-20	5-10
Antelope bitterbrush	PUTR2	5-15	---	5-15	---	---	5-15
Low sagebrush	ARAR8	---	20-30	---	---	---	---
Eriogonum	ERIOG	---	---	---	---	5-10	---
Other shrubs	SSSS	5-15	5-15	5-15	---	5-10	5-15

Range site number	026X005N	026X028N	026X005N	None	026X038N	026X005N
Potential production (lb/acre):						
Favorable years	1,500	350	1,500	---	1,500	1,500
Normal years	1,100	250	1,100	---	900	1,100
Unfavorable years	800	150	800	---	600	800

5080--Epvip-Hiridge-Katyblay association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Epvip	Hiridge	Katyblay	1	2	3	4
Western needlegrass	STOC2	15-35	---	20-40	20-35	---	20-35	---
Indian ricegrass	ORHY	5-10	---	---	---	---	---	---
Pine bluegrass	POSC	5-10	---	---	---	---	---	---
Sandberg bluegrass	POSE	2- 5	---	---	---	---	---	---
Bottlebrush squirreltail	SIHY	2- 5	---	---	---	---	---	---
Letterman needlegrass	STLE4	---	10-25	---	---	---	---	---
Bluegrass	POA++	---	5-10	---	5-10	---	5-10	---
Prairie junegrass	KOCR	---	2- 5	---	---	---	---	---
Basin wildrye	ELCI2	---	---	5-15	10-20	---	10-20	---
Mountain brome	BRMA4	---	---	5-10	10-20	---	10-20	---
Tufted hairgrass	DECA5	---	---	---	---	---	---	20-40
Sedge	CAREX	---	---	---	---	---	---	15-30
Rush	JUNCU	---	---	---	---	---	---	10-20
Nevada bluegrass	PONE3	---	---	---	---	---	---	10-15
Meadow barley	HOB2	---	---	---	---	---	---	5-10
Other perennial grasses	PPGG	5-10	10-15	5-15	5-15	---	5-15	2- 5
Perennial forbs	PPFF	5-10	5-15	10-20	5-15	---	5-15	5-10
Annual forbs	AAFF	---	---	5-10	2- 5	---	2- 5	---
Mountain big sagebrush	ARTRV	10-15	---	10-20	5-10	---	5-10	---
Antelope bitterbrush	PUTR2	5-10	---	---	5-15	---	5-15	---
Currant	RIBES	2- 5	---	---	---	---	---	---
Green ephedra	EPVI	2- 5	---	---	---	---	---	---
Low sagebrush	ARAR8	---	20-30	---	---	---	---	---
Eriogonum	ERIOG	---	---	5-10	---	---	---	---
Other shrubs	SSSS	2-10	5-15	5-10	5-15	---	5-15	5-10
Range site number		026X046N	026X028N	026X038N	026X005N	None	026X005N	027X004N
Potential production (lb/acre):								
Favorable years		800	350	1,500	1,500	---	1,500	2,500
Normal years		600	250	900	1,100	---	1,100	1,500
Unfavorable years		400	150	600	800	---	800	1,000

5100--Oricto-Gynelle-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Oricto	Gynelle	Izo	1	2
Indian ricegrass	ORHY	1-10	10-20	5-10	5-20	1-10
King desertgrass	BLKI	1- 2	---	---	---	1- 2
Bottlebrush squirreltail	SIHY	---	5-10	---	---	---
Galleta	HIJA	---	---	---	5-10	---
Other perennial grasses	PPGG	5-10	5-10	5-10	5-10	5-10
Annual grasses	AAGG	1- 5	---	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	3- 7	2- 6	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	1- 5	2- 5	2- 5
Shadscale	ATCO	20-40	10-20	---	5-15	20-40
Bailey greasewood	SAVEB	10-15	5-10	2-10	5-15	10-15
Cooper wolfberry	LYCO2	5-15	5-20	2- 5	---	5-15
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Nevada ephedra	EPNE	---	---	2- 5	5-10	---
Spiny menodora	MESP2	---	---	---	10-30	---
Bud sagebrush	ARSP5	---	---	---	5-10	---
Other shrubs	SSSS	5-15	5-15	10-20	10-20	5-15

Range site number	029X032N	027X043N	029X041N	029X036N	029X032N
Potential production (lb/acre):					
Favorable years	150	400	500	400	150
Normal years	100	200	300	300	100
Unfavorable years	50	100	100	100	50

5101--Oricto-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Oricto	Izo	1	2
Indian ricegrass	ORHY	1-10	5-10	5-20	2- 5
King desertgrass	BLKI	1- 2	---	---	1- 2
Galleta	HIJA	---	---	5-10	---
Bottlebrush squirreltail	SIHY	---	---	---	1- 2
Other perennial grasses	PPGG	5-10	5-10	5-10	1- 5
Annual grasses	AAGG	1- 5	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	2- 6	5-10	2- 5
Annual forbs	AAFF	2- 5	1- 5	2- 5	1- 5
Shadscale	ATCO	20-40	---	5-15	40-60
Bailey greasewood	SAVEB	10-15	2-10	5-15	10-15
Cooper wolfberry	LYCO2	5-15	2- 5	---	2- 5
Rubber rabbitbrush	CHNA2	---	10-25	---	---
Fourwing saltbush	ATCA2	---	5-15	---	---
Burrobrush	HYMEN3	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	5-10	---	---
Nevada ephedra	EPNE	---	2- 5	5-10	---
Spiny menodora	MESP2	---	---	10-30	---
Bud sagebrush	ARSP5	---	---	5-10	2- 5
Nevada dalea	DAPO2	---	---	---	5-10
Other shrubs	SSSS	5-15	10-20	10-20	5-15
Range site number		029X032N	029X041N	029X036N	029X033N
Potential production (lb/acre):					
Favorable years		150	500	400	100
Normal years		100	300	300	50
Unfavorable years		50	100	100	25

5103--Oricto, dry-Sundown-Oricto association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Oricto, dry	Sundown	Oricto	1	2	3	4
Indian ricegrass	ORHY	30-50	30-50	1-10	15-25	5-10	---	---
King desertgrass	BLKI	---	---	1- 2	---	---	---	---
Needleandthread	STCO4	---	---	---	10-15	---	---	---
Other perennial grasses	PPGG	2- 5	2- 5	5-10	---	5-10	---	---
Annual grasses	AAGG	---	---	1- 5	---	2- 4	---	---
Globemallow	SPHAE	1- 3	1- 3	---	---	---	---	---
Birdcage eveningprimrose	OEDE2	1- 3	1- 3	---	---	---	---	---
Other perennial forbs	PPFF	2- 5	2- 5	5-10	2- 5	2- 6	---	---
Annual forbs	AAFF	---	---	2- 5	2- 5	1- 5	---	---
Fourwing saltbush	ATCA2	15-30	15-30	---	10-20	5-15	---	---
Cooper wolfberry	LYCO2	10-20	10-20	5-15	---	2- 5	---	---
Nevada dalea	DAP02	5-10	5-10	---	5-10	---	---	---
Shadscale	ATCO	---	---	20-40	---	---	---	---
Bailey greasewood	SAVEB	---	---	10-15	---	2-10	---	---
Hairy horsebrush	TECO2	---	---	---	30-40	---	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	5-10	---	---
Rubber rabbitbrush	CHNA2	---	---	---	---	10-25	---	---
Burrobrush	HYMEN3	---	---	---	---	5-10	---	---
Nevada ephedra	EPNE	---	---	---	---	2- 5	---	---
Other shrubs	SSSS	5-15	5-15	5-15	5-10	10-20	---	---
Range site number		027X060N	027X060N	029X032N	027X023N	029X041N	None	None
Potential production (lb/acre):								
Favorable years		400	400	150	300	500	---	---
Normal years		200	200	100	200	300	---	---
Unfavorable years		100	100	50	100	100	---	---

## 5105--Oricto-Luning association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Oricto	Luning	1	2	3	4
Indian ricegrass	ORHY	1-10	30-50	30-50	30-50	30-50	---
King desertgrass	BLKI	1- 2	---	---	---	---	---
Inland saltgrass	DIST	---	---	---	---	---	X
Sedge	CAREX	---	---	---	---	---	X
Alkali muhly	MUAS	---	---	---	---	---	X
Desert needlegrass	STSP3	---	---	---	---	---	X
Other perennial grasses	PPGG	5-10	2- 5	2- 5	2- 5	2- 5	---
Annual grasses	AAGG	1- 5	---	---	---	---	---
Globemallow	SPHAE	---	1- 3	1- 3	1- 3	1- 3	---
Birdcage eveningprimrose	OEDE2	---	1- 3	1- 3	1- 3	1- 3	---
Other perennial forbs	PPFF	5-10	2- 5	2- 5	2- 5	2- 5	---
Annual forbs	AAFF	2- 5	---	---	---	---	---
Shadscale	ATCO	20-40	---	---	---	---	---
Bailey greasewood	SAVEB	10-15	---	---	---	---	---
Cooper wolfberry	LYCO2	5-15	10-20	10-20	10-20	10-20	X
Fourwing saltbush	ATCA2	---	15-30	15-30	15-30	15-30	X
Nevada dalea	DAPO2	---	5-10	5-10	5-10	5-10	---
Nevada ephedra	EPNE	---	---	---	---	---	X
Burrobrush	HYMEN3	---	---	---	---	---	X
Knapp brickellbush	BRKN	---	---	---	---	---	X
Other shrubs	SSSS	5-15	5-15	5-15	5-15	5-15	---
Range site number		029X032N	027X060N	027X060N	027X060N	027X060N	Variable
Potential production (lb/acre):							
Favorable years		150	400	400	400	400	---
Normal years		100	200	200	200	200	---
Unfavorable years		50	100	100	100	100	---

5106--Oricto-Barnmot-Gynelle association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Oricto	Barnmot	Gynelle	1	2	3
Indian ricegrass	ORHY	1-10	5-20	10-20	5-10	2- 5	---
King desertgrass	BLKI	1- 2	---	---	---	1- 2	---
Desert needlegrass	STSP3	---	2-10	---	---	---	---
Bottlebrush squirreltail	SIHY	---	---	5-10	---	1- 2	---
Other perennial grasses	PPGG	5-10	2- 5	5-10	5-10	1- 5	---
Annual grasses	AAGG	1- 5	---	---	2- 4	1- 5	---
Perennial forbs	PPFF	5-10	5-10	3- 7	2- 6	2- 5	---
Annual forbs	AAFF	2- 5	---	2- 5	1- 5	1- 5	---
Shadscale	ATCO	20-40	10-20	10-20	---	40-60	---
Bailey greasewood	SAVEB	10-15	5-15	5-10	2-10	10-15	---
Cooper wolfberry	LYCO2	5-15	---	5-20	2- 5	2- 5	---
Bud sagebrush	ARSP5	---	2-10	---	---	2- 5	---
Nevada ephedra	EPNE	---	2- 5	---	2- 5	---	---
Rubber rabbitbrush	CHNA2	---	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	---	5-10	---	---
Nevada dalea	DAPO2	---	---	---	---	5-10	---
Other shrubs	SSSS	5-15	5-10	5-15	10-20	5-15	---

Range site number	029X032N	027X027N	027X043N	029X041N	029X033N	None
Potential production (lb/acre):						
Favorable years	150	200	400	500	100	---
Normal years	100	100	200	300	50	---
Unfavorable years	50	50	100	100	25	---

## 5107--Oricto-Terlco-Roic association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Oricto	Terlco	Roic	1	2	3
Indian ricegrass	ORHY	1-10	5-20	2- 5	---	5-10	5-10
King desertgrass	BLKI	1- 2	---	1- 2	---	---	---
Galleta	HIJA	---	5-10	---	---	10-25	---
Bottlebrush squirreltail	SIHY	---	---	1- 2	---	2- 5	---
Needlegrass	STIPA	---	---	---	---	2- 5	---
Dropseed	SPORO	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	5-10	5-10	1- 5	---	5-15	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	---	1- 5	2- 4
Perennial forbs	PPFF	5-10	5-10	2- 5	---	4-10	2- 6
Annual forbs	AAFF	2- 5	2- 5	1- 5	---	1- 5	1- 5
Shadscale	ATCO	20-40	5-15	40-60	---	10-25	---
Bailey greasewood	SAVEB	10-15	5-15	10-15	---	5-10	2-10
Cooper wolfberry	LYCO2	5-15	---	2- 5	---	---	2- 5
Spiny menodora	MESP2	---	10-30	---	---	---	---
Bud sagebrush	ARSP5	---	5-10	2- 5	---	5-10	---
Nevada ephedra	EPNE	---	5-10	---	---	1- 5	2- 5
Nevada dalea	DAPO2	---	---	5-10	---	---	---
Winterfat	EULA5	---	---	---	---	5-10	---
Rubber rabbitbrush	CHNA2	---	---	---	---	---	10-25
Fourwing saltbush	ATCA2	---	---	---	---	---	5-15
Burrobrush	HYMEN3	---	---	---	---	---	5-10
Littleleaf horsebrush	TEGL	---	---	---	---	---	5-10
Other shrubs	SSSS	5-15	10-20	5-15	---	10-20	10-20
Range site number		029X032N	029X036N	029X033N	None	029X017N	029X041N
Potential production (lb/acre):							
Favorable years		150	400	100	---	350	500
Normal years		100	300	50	---	250	300
Unfavorable years		50	100	25	---	100	100

5110--Cucamungo Variant gravelly sandy loam, 4 to 15 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name	Inclusion number--			
		Cucamungo Variant	1	2	3	4
Western needlegrass	STOC2	15-30	X	---	---	---
Mountain brome	BRMA4	2- 5	---	---	---	---
Melic	Melic	2- 5	---	---	---	---
Pine bluegrass	POSC	---	X	---	---	---
Indian ricegrass	ORHY	---	X	5-15	X	---
Bottlebrush squirreltail	SIHY	---	X	1- 5	---	---
Galleta	HIJA	---	---	5-25	---	---
Needlegrass	STIPA	---	---	5-15	---	---
Dropseed	SPORO	---	---	5-10	---	---
Desert needlegrass	STSP3	---	---	---	X	---
Other perennial grasses	PPGG	15-20	X	5-20	X	---
Annual grasses	AAGG	---	---	1- 5	---	---
Globemallow	SPHAE	1- 2	---	---	---	---
Lupine	LUPIN	1- 2	---	---	---	---
Eriogonum	ERIOG	1- 2	---	---	---	---
Other perennial forbs	PFFF	---	X	3-10	X	---
Annual forbs	AAFF	---	---	2- 5	---	---
Mountain big sagebrush	ARTRV	5-10	X	---	---	---
Antelope bitterbrush	PUTR2	5-10	X	---	X	---
Snowberry	SYMPH	3- 5	---	---	---	---
Green ephedra	EPVI	---	X	---	---	---
Wyoming big sagebrush	ARTRW	---	---	15-20	X	---
Spiny hopsage	GRSP	---	---	5-10	---	---
Bud sagebrush	ARSP5	---	---	5-10	---	---
Winterfat	EULA5	---	---	2-10	---	---
Douglas rabbitbrush	CHVI8	---	---	---	X	---
Other shrubs	SSSS	10-15	X	10-20	X	---
Singleleaf pinyon	PIMO	---	X	---	X	---
Utah juniper	JUOS	---	X	---	X	---

Range site number	026X006N	026X060N	029X049N	026X061N	None
Potential production (lb/acre):					
Favorable years	1,000	300	900	225	---
Normal years	900	225	600	200	---
Unfavorable years	800	150	300	150	---

6000--Hiridge-Katyblay-Granmount association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Hiridge	Katyblay	Granmount	1	2	3	4
Letterman needlegrass	STLE4	10-25	---	10-25	---	---	---	---
Bluegrass	POA++	5-10	---	5-10	---	---	---	X
Prairie junegrass	KOCR	2- 5	---	2- 5	---	---	---	X
Western needlegrass	STOC2	---	20-40	---	---	---	---	---
Basin wildrye	ELCI2	---	5-15	---	2- 5	X	---	---
Mountain brome	BRMA4	---	5-10	---	---	X	---	---
Pine bluegrass	POSC	---	---	---	5-10	---	---	---
Wheatgrass	AGROP2	---	---	---	---	X	---	---
Nevada bluegrass	PONE3	---	---	---	---	X	---	---
Letterman needlegrass	STLE2	---	---	---	---	---	---	X
Spike fescue	HEKI	---	---	---	---	---	---	X
Other perennial grasses	PPGG	10-15	5-15	10-15	2-10	X	---	---
Arrowleaf balsamroot	BASA3	---	---	---	2- 5	---	---	---
Phlox	PHLOX	---	---	---	---	---	---	X
Antelope bitterbrush	PUTR2	---	---	---	---	---	---	X
Other perennial forbs	PPFF	5-15	10-20	5-15	2-10	X	---	---
Annual forbs	AAFF	---	5-10	---	---	---	---	---
Low sagebrush	ARAR8	20-30	---	20-30	---	---	---	---
Mountain big sagebrush	ARTRV	---	10-20	---	2- 5	X	---	X
Eriogonum	ERIOG	---	5-10	---	---	---	---	---
Curlleaf mountainmahogany	CELE3	---	---	---	45-65	---	---	---
Snowberry	SYMPH	---	---	---	2- 5	X	---	---
Other shrubs	SSSS	5-15	5-10	5-15	2-10	---	---	---
Quaking aspen	POTR5	---	---	---	---	X	---	---
Limber pine	PIFL2	---	---	---	---	---	---	X

Range site number	026X028N	026X038N	026X028N	026X009N	026X066N	None	026X067N
Potential production (lb/acre):							
Favorable years	50	1,500	350	1,000	3,000	---	600
Normal years	50	900	250	800	2,500	---	400
Unfavorable years	50	600	150	600	2,000	---	200

6001--Hiridge very gravelly sandy loam, 8 to 30 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions		
		Soil name	Inclusion number--	
		Hiridge	1	2
Letterman needlegrass	STLE4	10-25	---	---
Bluegrass	POA++	5-10	---	2-10
Prairie junegrass	KOCR	2- 5	---	---
Western needlegrass	STOC2	---	X	---
Pine bluegrass	POSC	---	X	---
Indian ricegrass	ORHY	---	X	5-10
Bottlebrush squirreltail	SIHY	---	X	1- 5
Galleta	HIJA	---	---	5-15
Needlegrass	STIPA	---	---	2-10
Other perennial grasses	PPGG	10-15	X	10-15
Annual grasses	AAGG	---	---	1- 5
Perennial forbs	PPFF	5-15	X	5-10
Annual forbs	AAFF	---	---	1- 5
Low sagebrush	ARAR8	20-30	---	---
Mountain big sagebrush	ARTRV	---	X	---
Antelope bitterbrush	PUTR2	---	X	---
Green ephedra	EPVI	---	X	---
Black sagebrush	ARARN	---	---	15-20
Nevada ephedra	EPNE	---	---	5-10
Bud sagebrush	ARSP5	---	---	2- 5
Winterfat	EULA5	---	---	2- 5
Other shrubs	SSSS	5-15	X	10-20
Singleleaf pinyon	PIMO	---	X	---
Utah juniper	JUOS	---	X	---

Range site number	026X028N	026X060N	029X014N
Potential production (lb/acre):			
Favorable years	350	300	500
Normal years	250	225	300
Unfavorable years	150	150	100

## 6010--Typic Cryorthents, 15 to 50 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Typic Cryorthents	1	2	3
Mountain brome	BRMA4	X	5-10	X	---
Wheatgrass	AGROP2	X	---	X	---
Basin wildrye	ELCI2	X	5-15	X	---
Nevada bluegrass	PONE3	X	---	X	---
Western needlegrass	STOC2	---	20-40	---	---
Letterman needlegrass	STLE2	---	---	---	X
Prairie junegrass	KOCR	---	---	---	X
Bluegrass	POA++	---	---	---	X
Spike fescue	HEKI	---	---	---	X
Other perennial grasses	PPGG	X	5-15	X	---
Phlox	PHLOX	---	---	---	X
Antelope bitterbrush	PUTR2	---	---	---	X
Other perennial forbs	PPFF	X	10-20	X	---
Annual forbs	AAFF	---	5-10	---	---
Mountain big sagebrush	ARTRV	X	10-20	X	X
Snowberry	SYMPH	X	---	X	---
Eriogonum	ERIOG	---	5-10	---	---
Other shrubs	SSSS	---	5-10	---	---
Quaking aspen	POTR5	X	---	X	---
Limber pine	PIFL2	---	---	---	X
Range site number		026X066N	026X038N	026X066N	026X067N
Potential production (lb/acre):					
Favorable years		3,000	1,500	3,000	600
Normal years		2,500	900	2,500	400
Unfavorable years		2,000	600	2,000	200

6020--Celeton-Dumps-Izo association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name			Inclusion number--	
		Celeton	Dumps	Izo	1	2
Indian ricegrass	ORHY	5-20	---	5-10	5-20	5-20
Desert needlegrass	STSP3	2-10	---	---	---	---
Galleta	HIJA	---	---	---	5-10	5-10
Other perennial grasses	PPGG	2- 5	---	5-10	5-10	5-10
Annual grasses	AAGG	---	---	2- 4	1- 5	1- 5
Perennial forbs	PPFF	5-10	---	2- 6	5-10	5-10
Annual forbs	AAFF	---	---	1- 5	2- 5	2- 5
Shadscale	ATCO	10-20	---	---	5-15	5-15
Bailey greasewood	SAVEB	5-15	---	2-10	5-15	5-15
Bud sagebrush	ARSP5	2-10	---	---	5-10	5-10
Nevada ephedra	EPNE	2- 5	---	2- 5	5-10	5-10
Rubber rabbitbrush	CHNA2	---	---	10-25	---	---
Fourwing saltbush	ATCA2	---	---	5-15	---	---
Burrobrush	HYMEN3	---	---	5-10	---	---
Littleleaf horsebrush	TEGL	---	---	5-10	---	---
Cooper wolfberry	LYCO2	---	---	2- 5	---	---
Spiny menodora	MESP2	---	---	---	10-30	10-30
Other shrubs	SSSS	5-10	---	10-20	10-20	10-20
Range site number		027X027N	None	029X041N	029X036N	029X036N
Potential production (lb/acre):						
Favorable years		200	---	500	400	400
Normal years		100	---	300	300	300
Unfavorable years		50	---	100	100	100

6060--Wiskiflat gravelly loamy sand, 2 to 15 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Wiskiflat	1	2	3
Desert needlegrass	STSP3	30-40	---	30-40	---
Indian ricegrass	ORHY	2- 5	---	2- 5	5-10
Sandberg bluegrass	POSE	---	2- 5	---	---
Basin wildrye	ELCI2	---	2- 5	---	---
Galleta	HIJA	---	---	---	5-15
Needlegrass	STIPA	---	---	---	2-10
Bottlebrush squirreltail	SIHY	---	---	---	1- 5
Other perennial grasses	PPGG	5-15	10-25	5-15	10-20
Annual grasses	AAGG	---	---	---	1- 5
Perennial forbs	PPFF	2- 5	2- 5	2- 5	5-10
Annual forbs	AAFF	---	2- 5	---	2- 5
Wyoming big sagebrush	ARTRW	10-20	---	10-20	15-20
Nevada ephedra	EPNE	5-10	---	5-10	2- 5
Big sagebrush	ARTR2	---	10-30	---	---
Rabbitbrush	CHRY9	---	10-30	---	---
Spiny hopsage	GRSP	---	10-20	---	2- 5
Fourwing saltbush	ATCA2	---	---	---	5-10
Winterfat	EULA5	---	---	---	2- 5
Other shrubs	SSSS	5-15	5-15	5-15	10-25

Range site number	027X067N	027X029N	027X067N	029X006N
Potential production (lb/acre):				
Favorable years	800	800	800	800
Normal years	500	500	500	500
Unfavorable years	350	100	350	300

6070--Breko-Crunker association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Breko	Crunker	1	2
Galleta	HIJA	5-15	5-25	---	5-10
Indian ricegrass	ORHY	5-10	5-15	---	5-20
Needlegrass	STIPA	2-10	5-15	---	---
Bottlebrush squirreltail	SIHY	1- 5	1- 5	---	---
Dropseed	SPORO	---	5-10	---	---
Sandberg bluegrass	POSE	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	2- 5	---
Other perennial grasses	PPGG	10-20	5-20	10-25	5-10
Annual grasses	AAGG	1- 5	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	3-10	2- 5	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	---	---
Fourwing saltbush	ATCA2	5-10	---	---	---
Nevada ephedra	EPNE	2- 5	---	---	5-10
Winterfat	EULA5	2- 5	2-10	---	---
Spiny hopsage	GRSP	2- 5	5-10	10-20	---
Bud sagebrush	ARSP5	---	5-10	---	5-10
Big sagebrush	ARTR2	---	---	10-30	---
Rabbitbrush	CHRYS9	---	---	10-30	---
Spiny menodora	MESP2	---	---	---	10-30
Bailey greasewood	SAVEB	---	---	---	5-15
Shadscale	ATCO	---	---	---	5-15
Other shrubs	SSSS	10-25	10-20	5-15	10-20

Range site number	029X006N	029X049N	027X029N	029X036N
Potential production (lb/acre):				
Favorable years	800	900	800	400
Normal years	500	600	500	300
Unfavorable years	300	300	100	100

6071--Breko stony loamy sand, 4 to 15 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Breko	1	2	3
Galleta	HIJA	5-15	5-15	5-15	5-15
Indian ricegrass	ORHY	5-10	5-10	5-10	5-10
Needlegrass	STIPA	2-10	2-10	2-10	2- 5
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5	1- 3
Other perennial grasses	PPGG	10-20	10-20	10-20	5-10
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	5-10	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	15-20	---
Fourwing saltbush	ATCA2	5-10	5-10	5-10	---
Nevada ephedra	EPNE	2- 5	2- 5	2- 5	1- 5
Winterfat	EULA5	2- 5	2- 5	2- 5	---
Spiny hopsage	GRSP	2- 5	2- 5	2- 5	5-15
Anderson wolfberry	LYAN	---	---	---	5-15
Nevada dalea	DAPO2	---	---	---	5-10
Cooper wolfberry	LYCO2	---	---	---	2- 5
Bud sagebrush	ARSP5	---	---	---	2- 5
Other shrubs	SSSS	10-25	10-25	10-25	10-20
Range site number		029X006N	029X006N	029X006N	029X021N
Potential production (lb/acre):					
Favorable years		800	800	800	300
Normal years		500	500	500	200
Unfavorable years		300	300	300	100

6072--Breko-Wiskiflat association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Breko	Wiskiflat	1	2	3	4
Galleta	HIJA	5-15	---	5-15	5-10	5-20	15-25
Indian ricegrass	ORHY	5-10	2- 5	5-10	5-20	5-10	5-10
Needlegrass	STIPA	2-10	---	2-10	---	2- 5	---
Bottlebrush squirreltail	SIHY	1- 5	---	1- 5	---	---	---
Desert needlegrass	STSP3	---	30-40	---	---	---	---
Dropseed	SPORO	---	---	---	---	5-15	---
Needleandthread	STCO4	---	---	---	---	---	5-10
Other perennial grasses	PPGG	10-20	5-15	10-20	5-10	5-10	2-10
Annual grasses	AAGG	1- 5	---	1- 5	1- 5	1- 5	---
Perennial forbs	PPFF	5-10	2- 5	5-10	5-10	5- 7	5-10
Annual forbs	AAFF	2- 5	---	2- 5	2- 5	2- 4	---
Wyoming big sagebrush	ARTRW	15-20	10-20	15-20	---	---	---
Fourwing saltbush	ATCA2	5-10	---	5-10	---	10-15	---
Nevada ephedra	EPNE	2- 5	5-10	2- 5	5-10	---	2- 5
Winterfat	EULA5	2- 5	---	2- 5	---	5-20	---
Spiny hopsage	GRSP	2- 5	---	2- 5	---	2- 8	---
Spiny menodora	MESP2	---	---	---	10-30	---	---
Bailey greasewood	SAVEB	---	---	---	5-15	---	---
Shadscale	ATCO	---	---	---	5-15	---	---
Bud sagebrush	ARSP5	---	---	---	5-10	5-10	---
Anderson wolfberry	LYAN	---	---	---	---	1- 5	---
Low sagebrush	ARAR8	---	---	---	---	---	20-30
Other shrubs	SSSS	10-25	5-15	10-25	10-20	10-25	5-15

Range site number	029X006N	027X067N	029X006N	029X036N	029X046N	027X049N
Potential production (lb/acre):						
Favorable years	800	800	800	400	450	500
Normal years	500	500	500	300	350	350
Unfavorable years	300	350	300	100	175	200

6073--Breko gravelly sandy loam, 2 to 8 percent slopes

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name	Inclusion number--		
		Breko	1	2	3
Galleta	HIJA	5-15	5-10	15-25	---
Indian ricegrass	ORHY	5-10	5-20	5-10	2- 5
Needlegrass	STIPA	2-10	---	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	---
Needleandthread	STCO4	---	---	5-10	---
Desert needlegrass	STSP3	---	---	---	30-40
Other perennial grasses	PPGG	10-20	5-10	2-10	5-15
Annual grasses	AAGG	1- 5	1- 5	---	---
Perennial forbs	PPFF	5-10	5-10	5-10	2- 5
Annual forbs	AAFF	2- 5	2- 5	---	---
Wyoming big sagebrush	ARTRW	15-20	---	---	10-20
Fourwing saltbush	ATCA2	5-10	---	---	---
Nevada ephedra	EPNE	2- 5	5-10	2- 5	5-10
Winterfat	EULA5	2- 5	---	---	---
Spiny hopsage	GRSP	2- 5	---	---	---
Spiny menodora	MESP2	---	10-30	---	---
Bailey greasewood	SAVEB	---	5-15	---	---
Shadscale	ATCO	---	5-15	---	---
Bud sagebrush	ARSP5	---	5-10	---	---
Low sagebrush	ARAR8	---	---	20-30	---
Other shrubs	SSSS	10-25	10-20	5-15	5-15
Range site number		029X006N	029X036N	027X049N	027X067N
Potential production (lb/acre):					
Favorable years		800	400	500	800
Normal years		500	300	350	500
Unfavorable years		300	100	200	350

6081--Handpah-Breko-Crunker association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Handpah	Breko	Crunker	1	2	3
Galleta	HIJA	5-15	5-15	5-25	5-15	5-25	5-25
Indian ricegrass	ORHY	5-10	5-10	5-15	5-10	5-15	5-15
Needlegrass	STIPA	2-10	2-10	5-15	2-10	5-15	5-15
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5	1- 5	1- 5	1- 5
Dropseed	SPORO	---	---	5-10	---	5-10	5-10
Other perennial grasses	PPGG	10-20	10-20	5-20	10-20	5-20	5-20
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	3-10	5-10	3-10	3-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	15-20	15-20	15-20	15-20
Fourwing saltbush	ATCA2	5-10	5-10	---	5-10	---	---
Nevada ephedra	EPNE	2- 5	2- 5	---	2- 5	---	---
Winterfat	EULA5	2- 5	2- 5	2-10	2- 5	2-10	2-10
Spiny hopsage	GRSP	2- 5	2- 5	5-10	2- 5	5-10	5-10
Bud sagebrush	ARSP5	---	---	5-10	---	5-10	5-10
Other shrubs	SSSS	10-25	10-25	10-20	10-25	10-20	10-20
Range site number		029X006N	029X006N	029X049N	029X006N	029X049N	029X049N
Potential production (lb/acre):							
Favorable years		800	800	900	800	900	900
Normal years		500	500	600	500	600	600
Unfavorable years		300	300	300	300	300	300

## 6082--Handpah-Breko association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions			
		Soil name		Inclusion number--	
		Handpah	Breko	1	2
Galleta	HIJA	5-15	5-15	5-25	5-15
Indian ricegrass	ORHY	5-10	5-10	5-15	5-10
Needlegrass	STIPA	2-10	2-10	5-15	2-10
Bottlebrush squirreltail	SIHY	1- 5	1- 5	1- 5	1- 5
Dropseed	SPORO	---	---	5-10	---
Other perennial grasses	PPGG	10-20	10-20	5-20	10-20
Annual grasses	AAGG	1- 5	1- 5	1- 5	1- 5
Perennial forbs	PPFF	5-10	5-10	3-10	5-10
Annual forbs	AAFF	2- 5	2- 5	2- 5	2- 5
Wyoming big sagebrush	ARTRW	15-20	15-20	15-20	15-20
Fourwing saltbush	ATCA2	5-10	5-10	---	5-10
Nevada ephedra	EPNE	2- 5	2- 5	---	2- 5
Winterfat	EULA5	2- 5	2- 5	2-10	2- 5
Spiny hopsage	GRSP	2- 5	2- 5	5-10	2- 5
Bud sagebrush	ARSP5	---	---	5-10	---
Other shrubs	SSSS	10-25	10-25	10-20	10-25
Range site number		029X006N	029X006N	029X049N	029X006N
Potential production (lb/acre):					
Favorable years		800	800	900	800
Normal years		500	500	600	500
Unfavorable years		300	300	300	300

6092--Beelem-Wassit association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Beelem	Wassit	1	2	3
Bottlebrush squirreltail	SIHY	X	X	---	1- 4	---
Indian ricegrass	ORHY	X	X	---	5-10	---
Western needlegrass	STOC2	---	X	---	---	---
Pine bluegrass	POSC	---	X	---	---	---
Galleta	HIJA	---	---	---	5-15	---
Needlegrass	STIPA	---	---	---	5-10	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	X	---	5-20	10-25
Annual grasses	AAGG	---	---	---	1- 5	---
Perennial forbs	PPFF	X	X	---	4-10	2- 5
Annual forbs	A AFF	---	---	---	2- 7	2- 5
Black sagebrush	ARARN	X	---	---	---	---
Wyoming big sagebrush	ARTRW	X	---	---	20-30	---
Nevada ephedra	EPNE	X	---	---	5-10	---
Green ephedra	EPVI	X	X	---	---	---
Mountain big sagebrush	ARTRV	---	X	---	---	---
Antelope bitterbrush	PUTR2	---	X	---	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	10-20
Other shrubs	SSSS	X	X	---	10-20	5-15
Utah juniper	JUOS	X	X	---	---	---
Singleleaf pinyon	PIMO	X	X	---	---	---

Range site number	029X081N	026X060N	None	029X010N	027X029N
Potential production (lb/acre):					
Favorable years	125	300	---	600	800
Normal years	75	225	---	400	500
Unfavorable years	25	150	---	200	100

6093--Beelem-Stewval-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Beelem	Stewval	Rock outcrop	1	2	3	4
Bottlebrush squirreltail	SIHY	X	1- 5	---	---	---	1- 4	---
Indian ricegrass	ORHY	X	5-10	---	---	---	5-10	---
Galleta	HIJA	---	5-15	---	---	---	5-15	---
Needlegrass	STIPA	---	2-10	---	---	X	5-10	---
Bluegrass	POA++	---	2-10	---	---	---	---	---
Desert needlegrass	STSP3	---	---	---	5-10	---	---	---
Pine bluegrass	POSC	---	---	---	---	X	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	10-15	---	10-25	X	5-20	10-25
Annual grasses	AAGG	---	1- 5	---	---	---	1- 5	---
Perennial forbs	PPFF	X	5-10	---	2- 5	X	4-10	2- 5
Annual forbs	AAFF	---	1- 5	---	---	---	2- 7	2- 5
Black sagebrush	ARARN	X	15-20	---	20-40	X	---	---
Wyoming big sagebrush	ARTRW	X	---	---	---	---	20-30	---
Nevada ephedra	EPNE	X	5-10	---	2- 5	---	5-1	---
Green ephedra	EPVI	X	---	---	---	X	---	---
Bud sagebrush	ARSP5	---	2- 5	---	---	---	---	---
Winterfat	EULA5	---	2- 5	---	---	---	---	---
Bailey greasewood	SAVEB	---	---	---	5-15	---	---	---
Douglas rabbitbrush	CHVI8	---	---	---	---	X	---	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	---	10-20
Other shrubs	SSSS	X	10-20	---	5-15	X	10-20	5-15
Utah juniper	JUOS	X	---	---	---	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---	---	---
Other trees	TTTT	---	---	---	---	X	---	---

Range site number	029X081N	029X014N	None	027X061N	029X082N	029X010N	027X029N
Potential production (lb/acre):							
Favorable years	125	500	---	200	200	600	800
Normal years	75	300	---	100	125	400	500
Unfavorable years	25	100	---	50	50	200	100

6094--Beelem-Bellehelen-Stewval association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Beelem	Bellehelen	Stewval	1	2	3	4
Bottlebrush squirreltail	SIHY	X	---	1- 5	1- 4	---	1- 5	---
Indian ricegrass	ORHY	X	---	5-10	5-10	---	5-10	---
Pine bluegrass	POSC	---	X	---	---	X	---	---
Needlegrass	STIPA	---	X	2-10	5-10	X	2-10	---
Galleta	HIJA	---	---	5-15	5-15	---	5-15	---
Bluegrass	POA++	---	---	2-10	---	---	2-10	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	X	10-15	5-20	X	10-15	10-25
Annual grasses	AAGG	-	---	1- 5	1- 5	---	1- 5	---
Perennial forbs	PPFF	X	X	5-10	4-10	X	5-10	2- 5
Annual forbs	AAFF	---	---	1- 5	2- 7	---	1- 5	2- 5
Black sagebrush	ARARN	X	X	15-20	---	X	15-20	---
Wyoming big sagebrush	ARTRW	X	---	---	20-30	---	---	---
Nevada ephedra	EPNE	X	---	5-10	5-10	---	5-10	---
Green ephedra	EPVI	X	X	---	---	X	---	---
Douglas rabbitbrush	CHVI8	---	X	---	---	X	---	---
Bud sagebrush	ARSP5	---	---	2- 5	---	---	2- 5	---
Winterfat	EULA5	---	---	2- 5	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	---	10-20
Other shrubs	SSSS	X	X	10-20	10-20	X	10-20	5-15
Utah juniper	JUOS	X	---	---	---	---	---	---
Singleleaf pinyon	PIMO	X	---	---	---	---	---	---
Other trees	TTTT	---	X	---	---	X	---	---

Range site number	029X081N	029X082N	029X014N	029X010N	29X082N	029X014N	027X029N
Potential production (lb/acre):							
Favorable years	125	200	500	600	200	500	800
Normal years	75	125	300	400	125	300	500
Unfavorable years	25	50	100	200	50	100	100

## 7000--Logring-Kyler association, steep

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Logring	Kyler	1	2	3
Bluegrass	POA++	X	2-10	---	X	---
Bottlebrush squirreltail	SIHY	X	1- 5	---	X	---
Galleta	HIJA	---	5-15	---	---	---
Indian ricegrass	ORHY	---	5-10	---	---	---
Needlegrass	STIPA	---	2-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	10-15	---	X	10-25
Annual grasses	AAGG	---	1- 5	---	---	---
Perennial forbs	PPFF	X	5-10	---	X	2- 5
Annual forbs	AAFF	---	1- 5	---	---	2- 5
Black sagebrush	ARARN	X	15-20	---	X	---
Green ephedra	EPVI	X	-	---	X	---
Nevada ephedra	EPNE	---	5-10	---	---	---
Bud sagebrush	ARSP5	---	2- 5	---	---	---
Winterfat	EULA5	---	2- 5	---	---	---
Big sagebrush	ARTR2	---	---	---	---	10-30
Rabbitbrush	CHRY9	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	10-20
Other shrubs	SSSS	X	10-20	---	X	5-15
Utah juniper	JUOS	X	---	---	X	---
Range site number		029X080N	029X014N	None	029X080N	027X029N
Potential production (lb/acre):						
Favorable years		200	500	---	200	800
Normal years		125	300	---	125	500
Unfavorable years		50	100	---	50	100

7001--Logring-Kyler association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Logring	Kyler	1	2	3	4
Bluegrass	POA++	X	2-10	---	---	2-10	2-10
Bottlebrush squirreltail	SIHY	X	1- 5	---	---	1- 5	1- 5
Galleta	HIJA	---	5-15	---	---	5-15	5-15
Indian ricegrass	ORHY	---	5-10	---	---	5-10	5-10
Needlegrass	STIPA	---	2-10	---	---	2-10	2-10
Sandberg bluegrass	POSE	---	---	2- 5	---	---	---
Basin wildrye	ELCI2	---	---	2- 5	---	---	---
Other perennial grasses	PPGG	X	10-15	10-25	---	10-15	10-15
Annual grasses	AAGG	---	1- 5	---	---	1- 5	1- 5
Perennial forbs	PPFF	X	5-10	2- 5	---	5-10	5-10
Annual forbs	AAFF	---	1- 5	2- 5	---	1- 5	1- 5
Black sagebrush	ARARN	X	15-20	---	---	15-20	15-20
Green ephedra	EPVI	X	---	---	---	---	---
Nevada ephedra	EPNE	---	5-10	---	---	5-10	5-10
Bud sagebrush	ARS5	---	2- 5	---	---	2- 5	2- 5
Winterfat	EULA5	---	2- 5	---	---	2- 5	2- 5
Big sagebrush	ARTR2	---	---	10-30	---	---	---
Rabbitbrush	CHRYS9	---	---	10-30	---	---	---
Spiny hopsage	GRSP	---	---	10-20	---	---	---
Other shrubs	SSSS	X	10-20	5-15	---	10-20	10-20
Utah juniper	JUOS	X	---	---	---	---	---

Range site number	029X080N	029X014N	027X029N	None	029X014N	029X014N
Potential production (lb/acre):						
Favorable years	200	500	800	---	500	500
Normal years	125	300	500	---	300	300
Unfavorable years	50	100	100	---	100	100

7002--Logring-Eaglepass-Kyler complex, 15 to 75 percent slopes

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Logring	Eaglepass	Kyler	1	2	3
Bluegrass	POA++	X	---	2-10	---	---	---
Bottlebrush squirreltail	SIHY	X	---	1- 5	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	1- 3	10-15	---	10-20	10-25
Annual grasses	AAGG	---	1- 3	1- 5	---	---	---
Perennial forbs	PPFF	X	1- 4	5-10	---	5-10	2- 5
Annual forbs	AAFF	---	1- 3	1- 5	---	---	2- 5
Black sagebrush	ARARN	X	1-10	15-20	---	20-30	---
Green ephedra	EPVI	X	---	---	---	---	---
Littleleaf mountainmahogany	CELEI2	---	50-75	---	---	---	---
Nevada greasebush	GLNE	---	10-20	---	---	---	---
Wyoming big sagebrush	ARTRW	---	1- 5	---	---	---	---
Nevada ephedra	EPNE	---	---	5-10	---	---	---
Bud sagebrush	ARSP5	---	---	2- 5	---	2- 5	---
Winterfat	EULA5	---	---	2- 5	---	5-10	---
Small rabbitbrush	CHVIS	---	---	---	---	2- 5	---
Big sagebrush	ARTR2	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	10-20
Other shrubs	SSSS	X	5-15	10-20	---	10-20	5-15
Utah juniper	JUOS	X	---	---	---	---	---

Range site number	029X080N	029X040N	029X014N	None	028B011N	027X029N
Potential production (lb/acre):						
Favorable years	200	350	500	---	1,000	800
Normal years	125	250	300	---	700	500
Unfavorable years	50	150	100	---	400	100

7010--Armoine-Beelem association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Armoine	Beelem	1	2	3	4
Galleta	HIJA	5-15	---	5-25	---	---	5-15
Indian ricegrass	ORHY	5-10	X	5-15	---	---	5-10
Needlegrass	STIPA	2-10	---	5-15	---	---	2-10
Bluegrass	POA++	2-10	---	---	---	---	2-10
Bottlebrush squirreltail	SIHY	1- 5	X	1- 5	---	---	1- 5
Dropseed	SPORO	---	---	5-10	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	2- 5	---
Basin wildrye	ELCI2	---	---	---	---	2- 5	---
Other perennial grasses	PPGG	10-15	X	5-20	---	10-25	10-15
Annual grasses	AAGG	1- 5	---	1- 5	---	---	1- 5
Perennial forbs	PPFF	5-10	X	3-10	---	2- 5	5-10
Annual forbs	AAFF	1- 5	---	2- 5	---	2- 5	1- 5
Black sagebrush	ARARN	15-20	X	---	---	---	15-20
Nevada ephedra	EPNE	5-10	X	---	---	---	5-10
Bud sagebrush	ARSP5	2- 5	---	5-10	---	---	2- 5
Winterfat	EULA5	2- 5	---	2-10	---	---	2- 5
Wyoming big sagebrush	ARTRW	---	X	15-20	---	---	---
Green ephedra	EPVI	---	X	---	---	---	---
Spiny hopsage	GRSP	---	---	5-10	---	10-20	---
Big sagebrush	ARTR2	---	---	---	---	10-30	---
Rabbitbrush	CHRY9	---	---	---	---	10-30	---
Other shrubs	SSSS	10-20	X	10-20	---	5-15	10-20
Utah juniper	JUOS	---	X	---	---	---	---
Singleleaf pinyon	PIMO	---	X	---	---	---	---

Range site number	029X014N	029X081N	029X049N	None	027X029N	029X014N
Potential production (lb/acre):						
Favorable years	500	125	900	---	800	500
Normal years	300	75	600	---	500	300
Unfavorable years	100	25	300	---	100	100

## 7012--Armoine-Petspring association

(Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name		Inclusion number--			
		Armoine	Petspring	1	2	3	4
Galleta	HIJA	5-15	5-15	---	5-15	---	10-20
Indian ricegrass	ORHY	5-10	5-10	---	5-10	5-15	2- 5
Needlegrass	STIPA	2-10	---	---	2-10	---	5-10
Bluegrass	POA++	2-10	---	---	2-10	---	---
Bottlebrush squirreltail	SIHY	1- 5	---	---	1- 5	5-10	---
Desert needlegrass	STSP3	---	20-40	---	---	---	---
Pine bluegrass	POSC	---	---	---	---	5-15	---
Needleandthread	STCO4	---	---	---	---	2-10	---
Other perennial grasses	PPGG	10-15	5-10	---	10-15	5-10	5-10
Annual grasses	AAGG	1- 5	---	---	1- 5	---	1- 5
Perennial forbs	PPFF	5-10	2- 5	---	5-10	5-10	5-10
Annual forbs	AAFF	1- 5	---	---	1- 5	---	2- 5
Black sagebrush	ARARN	15-20	---	---	15-20	---	---
Nevada ephedra	EPNE	5-10	5-15	---	5-10	5-10	5-10
Bud sagebrush	ARSP5	2- 5	---	---	2- 5	---	2- 5
Winterfat	EULA5	2- 5	---	---	2- 5	---	---
Wyoming big sagebrush	ARTRW	---	15-25	---	---	10-20	---
Spiny hopsage	GRSP	---	5-15	---	---	10-20	---
Spiny menodora	MESP2	---	---	---	---	---	10-25
Bailey greasewood	SAVEB	---	---	---	---	---	5-10
Anderson wolfberry	LYAN	---	---	---	---	---	5-10
Shadscale	ATCO	---	---	---	---	---	2- 5
Littleleaf horsebrush	TEGL	---	---	---	---	---	---
Burrobrush	HYMEN3	---	---	---	---	---	---
Other shrubs	SSSS	10-20	5-10	---	10-20	5-15	15-25
Range site number		029X014N	027X065N	None	029X014N	027X008N	029X037N
Potential production (lb/acre):							
Favorable years		500	500	---	500	700	300
Normal years		300	300	---	300	500	200
Unfavorable years		100	200	---	100	300	100

7020--Squawtip-Brier-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Squawtip	Brier	Rock outcrop	1	2	3	4
Western needlegrass	STOC2	X	---	---	---	---	---	15-35
Pine bluegrass	POSC	X	X	---	X	---	---	5-10
Indian ricegrass	ORHY	X	---	---	---	X	5-10	5-10
Bottlebrush squirreltail	SIHY	X	X	---	X	X	1- 5	2- 5
Galleta	HIJA	---	---	---	---	---	5-15	---
Needlegrass	STIPA	---	---	---	---	---	2-10	---
Bluegrass	POA++	---	---	---	---	---	2-10	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	X	---	X	X	10-15	5-10
Annual grasses	AAGG	---	---	---	---	---	1- 5	---
Perennial forbs	PPFF	X	X	---	X	X	5-10	5-10
Annual forbs	AAFF	---	---	---	---	---	1- 5	---
Mountain big sagebrush	ARTRV	X	X	---	X	---	---	10-15
Antelope bitterbrush	PUTR2	X	---	---	---	---	---	5-10
Green ephedra	EPVI	X	X	---	X	X	---	2- 5
Wyoming big sagebrush	ARTRW	---	X	---	X	X	---	---
Black sagebrush	ARARN	---	---	---	---	X	15-20	---
Nevada ephedra	EPNE	---	---	---	---	X	5-10	---
Bud sagebrush	ARSP5	---	---	---	---	---	2- 5	---
Winterfat	EULA5	---	---	---	---	---	2- 5	---
Currant	RIBES	---	---	---	---	---	---	2- 5
Other shrubs	SSSS	X	X	---	X	X	10-20	2-10
Singleleaf pinyon	PIMO	X	X	---	X	X	---	---
Utah juniper	JUOS	X	X	---	X	X	---	---

Range site number	026X060N	026X062N	None	026X062N	029X081N	029X014N	026X046N
Potential production (lb/acre):							
Favorable years	300	250	---	250	125	500	800
Normal years	225	200	---	200	75	300	600
Unfavorable years	150	150	---	150	25	100	400

## 7021--Squawtip-Gabbvally-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Squawtip	Gabbvally	Rock outcrop	1	2	3	4
Western needlegrass	STOC2	X	---	---	---	---	X	---
Pine bluegrass	POSC	X	---	---	X	---	X	---
Indian ricegrass	ORHY	X	5-10	---	---	X	X	---
Bottlebrush squirreltail	SIHY	X	1- 4	---	---	X	X	---
Galleta	HIJA	---	5-15	---	---	---	---	---
Needlegrass	STIPA	---	5-10	---	X	---	---	---
Sandberg bluegrass	POSE	---	---	---	---	---	---	2- 5
Basin wildrye	ELCI2	---	---	---	---	---	---	2- 5
Other perennial grasses	PPGG	X	5-20	---	X	X	X	10-25
Annual grasses	AAGG	---	1- 5	---	---	---	---	---
Perennial forbs	PPFF	X	4-10	---	X	X	X	2- 5
Annual forbs	AAFF	---	2- 7	---	---	---	---	2- 5
Mountain big sagebrush	ARTRV	X	---	---	---	---	X	---
Antelope bitterbrush	PUTR2	X	---	---	---	---	X	---
Green ephedra	EPVI	X	---	---	X	X	X	---
Wyoming big sagebrush	ARTRW	---	20-30	---	---	X	---	---
Nevada ephedra	EPNE	---	5-10	---	---	X	---	---
Black sagebrush	ARARN	---	---	---	X	X	---	---
Douglas rabbitbrush	CHVI8	---	---	---	X	---	---	---
Big sagebrush	ARTR2	---	---	---	---	---	---	10-30
Rabbitbrush	CHRYS9	---	---	---	---	---	---	10-30
Spiny hopsage	GRSP	---	---	---	---	---	---	10-20
Other shrubs	SSSS	X	10-20	---	X	X	X	5-15
Singleleaf pinyon	PIMO	X	---	---	---	X	X	---
Utah juniper	JUOS	X	---	---	---	X	X	---
Other trees	TTTT	---	---	---	X	---	---	---
Range site number		026X060N	029X010N	None	029X082N	029X081N	026X060N	027X029N
Potential production (lb/acre):								
Favorable years		300	600	---	200	125	300	800
Normal years		225	400	---	125	75	225	500
Unfavorable years		150	200	---	50	25	150	100

8030--Ravenswood-Brier-Itca association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions					
		Soil name			Inclusion number--		
		Ravenswood	Brier	Itca	1	2	3
Western needlegrass	STOC2	X	---	X	---	---	---
Pine bluegrass	POSC	X	X	X	---	---	---
Indian ricegrass	ORHY	X	---	X	---	X	5-10
Bottlebrush squirreltail	SIHY	X	X	X	---	X	1- 4
Galleta	HIJA	---	---	---	---	---	5-15
Needlegrass	STIPA	---	---	---	---	---	5-10
Other perennial grasses	PPGG	X	X	X	---	X	5-20
Annual grasses	AAGG	---	---	---	---	---	1- 5
Perennial forbs	PPFF	X	X	X	---	X	4-10
Annual forbs	AAFF	---	---	---	---	---	2- 7
Mountain big sagebrush	ARTRV	X	X	X	---	---	---
Antelope bitterbrush	PUTR2	X	---	X	---	---	---
Green ephedra	EPVI	X	X	X	---	X	---
Wyoming big sagebrush	ARTRW	---	X	---	---	X	20-30
Black sagebrush	ARARN	---	---	---	---	X	---
Nevada ephedra	EPNE	---	---	---	---	X	5-10
Other shrubs	SSSS	X	X	X	---	X	10-20
Singleleaf pinyon	PIMO	X	X	X	---	X	---
Utah juniper	JUOS	X	X	X	---	X	---
Range site number		026X060N	026X062N	026X060N	None	029X081N	029X010N
Potential production (lb/acre):							
Favorable years		300	250	300	---	125	600
Normal years		225	200	225	---	75	400
Unfavorable years		150	150	150	---	25	200

## 8040--Jetcop-Gabbvally association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions				
		Soil name		Inclusion number--		
		Jetcop	Gabbvally	1	2	3
Galleta	HIJA	5-15	5-15	---	5-10	---
Needlegrass	STIPA	5-10	5-10	---	---	---
Indian ricegrass	ORHY	5-10	5-10	X	5-20	---
Bottlebrush squirreltail	SIHY	1- 4	1- 4	X	---	---
Western needlegrass	STOC2	---	---	X	---	---
Pine bluegrass	POSC	---	---	X	---	---
Other perennial grasses	PPGG	5-20	5-20	X	5-10	---
Annual grasses	AAGG	1- 5	1- 5	---	1- 5	---
Perennial forbs	PPFF	4-10	4-10	X	5-10	---
Annual forbs	AAFF	2- 7	2- 7	---	2- 5	---
Wyoming big sagebrush	ARTRW	20-30	20-30	---	---	---
Nevada ephedra	EPNE	5-10	5-10	---	5-10	---
Mountain big sagebrush	ARTRV	---	---	X	---	---
Antelope bitterbrush	PUTR2	---	---	X	---	---
Green ephedra	EPVI	---	---	X	---	---
Spiny menodora	MESP2	---	---	---	10-30	---
Bailey greasewood	SAVEB	---	---	---	5-15	---
Shadscale	ATCO	---	---	---	5-15	---
Bud sagebrush	ARSP5	---	---	---	5-10	---
Other shrubs	SSSS	10-20	10-20	X	10-20	---
Singleleaf pinyon	PIMO	---	---	X	---	---
Utah juniper	JUOS	---	---	X	---	---
Range site number		029X010N	029X010N	026X060N	029X036N	None
Potential production (lb/acre):						
Favorable years		600	600	300	400	---
Normal years		400	400	225	300	---
Unfavorable years		200	200	150	100	---

8050--Itca-Teguro-Rock outcrop association

(An X indicates that the named plant is in the potential native woodland understory and the percentage is highly variable. Absence of an entry indicates that the named plant is not a key species in the potential native plant community)

Common plant name	Plant symbol	Percentage composition and production (dry weight) of plants on major soils and inclusions						
		Soil name			Inclusion number--			
		Itca	Teguro	Rock outcrop	1	2	3	4
Western needlegrass	STOC2	X	X	---	---	---	X	X
Pine bluegrass	POSC	X	X	---	---	---	X	X
Indian ricegrass	ORHY	X	X	---	---	---	X	X
Bottlebrush squirreltail	SIHY	X	X	---	X	X	X	X
Thurber needlegrass	STH2	---	---	---	X	X	---	---
Ricegrass	ORYZO	---	---	---	X	X	---	---
Other perennial grasses	PPGG	X	X	---	X	X	X	X
Perennial forbs	PPFF	X	X	---	X	X	X	X
Mountain big sagebrush	ARTRV	X	X	---	---	---	X	X
Antelope bitterbrush	PUTR2	X	X	---	X	X	X	X
Green ephedra	EPVI	X	X	---	X	X	X	X
Low sagebrush	ARAR8	---	---	---	X	X	---	---
Other shrubs	SSSS	X	X	---	X	X	X	X
Singleleaf pinyon	PIMO	X	X	---	X	X	X	X
Utah juniper	JUOS	X	X	---	X	X	X	X

Range site number	026X060N	026X060N	None	026X064N	026X064N	026X060N	026X060N
Potential production (lb/acre):							
Favorable years	300	300	---	325	325	300	300
Normal years	225	225	---	225	225	225	225
Unfavorable years	150	150	---	150	150	150	150

# **NRCS Accessibility Statement**

---

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at [ServiceDesk-FTC@ftc.usda.gov](mailto:ServiceDesk-FTC@ftc.usda.gov). For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at <http://offices.sc.egov.usda.gov/locator/app>.

