137 - Merlin - Wenzel families - Rock outcrop (continued)

Range Interpretations			
Productivity (lb/acre)	200 to 250	600 to 1000	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; 40% shallow soils; 20% rock outcrop; high erosion hazard; steep slopes	Plant competition; 40% shallow soils; 20% rock outcrop; high erosion hazard; steep slopes	

Recreation Interpretations - Limitations for

Camp Areas	5-8% slopes: Moderate - large & small stones; perc slowly 8-15% slopes: Moderate - slope; large & small stones; perc slowly 15-30% slopes: Severe - slope	Severe: Slope	—
Picnic Areas	5-8% slopes: Moderate - large & small stones; perc slowly 8-15% slopes: Moderate - slope; large & small stones; perc slowly 15-30% slopes: Severe - slope	Severe: Slope	—
Paths & Trails	5-15% slopes: Moderate - Large & small stones 15-25% slopes: Moderate - slope: large & small stones 25-30% slopes: Severe - slope	Severe: Slope	—

Engineering Interpretations

Unified Class			
Surface	SM-SC	SM	—
Subsoil	ML	SC	—
Substratum	—	—	—
AASHTO Class			
Surface	A-2-4; A-4	A-1-b; A-2-4	—
Subsoil	A-7-6	A-2-7	—
Substratum	—	—	—
Suitability for			
Sand	Unsuited	Unsuited	—
Gravel	Unsuited	Unsuited	—
Topsoil	5-15% slopes: Poor - small stones; area reclaim 15-30% slopes: Poor - slope; small stones; area reclaim	Poor: Slope; small stones	—
Roadfill	5-25% slopes: Poor - low strength; area reclaim 25-30% slopes: Poor - slope; low strength; area reclaim	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Hartig family, 30 to 60 percent slopes, on mountainsides; and the Bearskin family, 5 to 30 percent slopes, on edges of mountainsides, between the Merlin and Wenzel families. Included areas make up approximately 15 percent of the map unit area.

Rock outcrop is olivine basalt.

138 - Mexispring family - Rock outcrop, granitic association, 15 to 30 percent slopes

Elevation: 4,400 to 6,900 feet Annual Precipitation: 6 inches

Soil Map Unit Components	Mexispring family	Rock outcrop, granitic
Approx Proportion	50 percent	20 percent
Landscape Position	Mountainsides	Ridgetops, convex mountainsides
Slope	15 to 30 percent	—
Typical Vegetation	Saltbrush (Altriplex spp.); Buckwheat (Eriogonum spp.); Morman Tea (Ephedra spp.)	—

Soil Profile Description

Surface Layer	0 to 11 inches; pale brown & very pale brown very gravelly loamy coarse sand & gravelly coarse sandy loam; massive; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	11 inches; Weathered, slightly fractured granodiorite (paralithic contact)	—

Soil Properties

Restrictive Layer Depth	8 to 12 inches PARA	—
Effective Rooting Depth (inches)	8 to 12 inches	—
Available Water Capacity	Very low (0.4 to 0.7 inches)	—
Water Retention Class	3 (0.4 to 0.7 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Rapid	—
Max Erosion Hazard	High	—
Erosion Factor (k)		
Surface	0.10 (low)	—
Subsurface	0.17 (low)	—
T Value	1	—
Wind Erodability Group	2	—

138 - Mexispring family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4DEPX	—

Range Interpretations

Productivity (lb/acre)	200 to 350	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 50% shallow soils; 20% rock outcrop; high erosion hazard	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - slope	—

Engineering Interpretations

Unified Class		
Surface	GW-GM	—
Subsoil	—	—
Substratum	SM	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	—	—
Substratum	A-1-b; A-2-4	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; small stones; area reclaim	—
Roadfill	15-25% slopes: Poor - area reclaim 25-30% slopes: Poor - slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Checkett family, but drier and shallow to soft bedrock, on benches of mountainsides and tops of knolls; a soil similar to the Mexispring family, but calcareous, on mountainsides; and a soil similar to the Trocken family, but with less than 35 percent rock fragments in the profile, 9 to 30 percent slopes, on lower mountainsides and toeslopes. Included areas make up approximately 30 percent of the map unit area.

139 - Mexispring family - Rock outcrop, granitic association, 30 to 60 percent slopes

Elevation: 4,500 to 5,400 feet Annual Precipitation: 6 inches

Soil Map Unit Components	Mexispring family	Rock outcrop, granitic
Approx Proportion	45 percent	30 percent
Landscape Position	Mountainsides	Ridgetops, convex mountainsides
Slope	30 to 60 percent	—
Typical Vegetation	Saltbrush (Altriplex spp.); Buckwheat (Eriogonum spp.); Morman Tea (Ephedra spp.)	—

Soil Profile Description

Surface Layer	0 to 11 inches; pale brown & very pale brown very gravelly loamy coarse sand & gravelly coarse sandy loam; massive; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	11 inches; Weathered, slightly fractured granodiorite (paralithic contact)	—

Soil Properties

Restrictive Layer Depth	8 to 12 inches PARA	—
Effective Rooting Depth (inches)	8 to 12 inches	—
Available Water Capacity	Very low (0.4 to 0.7 inches)	—
Water Retention Class	3 (0.4 to 0.7 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Rapid to Very Rapid	—
Max Erosion Hazard	High to very high	—
Erosion Factor (k)		
Surface	0.10 (low)	—
Subsurface	0.17 (low)	—
T Value	1	—
Wind Erodability Group	2	—

139 - Mexispring family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4DEPXg	—

Range Interpretations

Productivity (lb/acre)	200 to 350	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 45% shallow soils; 30% rock outcrop; very high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	GW-GM	—
Subsoil	—	—
Substratum	SM	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	—	—
Substratum	A-1-b; A-2-4	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; small stones; area reclaim	—
Roadfill	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Mexispring family, but calcareous, on mountainsides; a soil similar to the Trocken family, but with less than 35 percent rock fragments in the profile, 15 to 30 percent slopes, on lower mountainsides and toeslopes; and a soil similar to the Checkett family, but drier and shallow to soft bedrock, 9 to 30 percent slopes, on benches of mountainsides and tops of knolls. Included areas make up approximately 25 percent of the map unit area.

140 - Mexispring family - Rock outcrop, granitic association, 60 to 80 percent slopes

Elevation: 4,500 to 6,400 feet Annual Precipitation: 6 inches

Soil Map Unit Components	Mexispring family	Rock outcrop, granitic
Approx Proportion	45 percent	35 percent
Landscape Position	Mountainsides	Ridgetops, convex mountainsides
Slope	60 to 80 percent	—
Typical Vegetation	Saltbrush (Altriplex spp.); Buckwheat (Eriogonum spp.); Morman Tea (Ephedra spp.)	—

Soil Profile Description

Surface Layer	0 to 11 inches; pale brown & very pale brown very gravelly loamy coarse sand & gravelly coarse sandy loam; massive; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	11 inches; Weathered, slightly fractured granodiorite (paralithic contact)	—

Soil Properties

Restrictive Layer Depth	8 to 12 inches PARA	—
Effective Rooting Depth (inches)	8 to 12 inches	—
Available Water Capacity	Very low (0.4 to 0.7 inches)	—
Water Retention Class	3 (0.4 to 0.7 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Very Rapid	—
Max Erosion Hazard	Very high	—
Erosion Factor (k)		
Surface	0.10 (low)	—
Subsurface	0.17 (low)	—
T Value	1	—
Wind Erodability Group	2	—

140 - Mexispring family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4DEGPX	—

Range Interpretations

Productivity (lb/acre)	200 to 350	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 45% shallow soils; 35% rock outcrop; very high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	GW-GM	—
Subsoil	—	—
Substratum	SM	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	—	—
Substratum	A-1-b; A-2-4	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; small stones; area reclaim	—
Roadfill	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to Mexispring family, but with a calcareous profile, on mountainsides; and a soil similar to the Trocken family, but with less than 35 percent rock fragments in the profile, on 30 to 60 percent slopes, on lower mountainsides and toeslopes. Included areas make up approximately 20 percent of the map unit area.

141 - Midas - Cath - Mackey families complex, 4 to 15 percent slopes

Elevation: 6,700 to 8,300 feet Annual Precipitation: 8 to 9 inches

Soil Map Unit Components	Midas family	Cath family	Mackey family
Approx Proportion	35 percent	20 percent	15 percent
Landscape Position	Old alluvial fans	Ridges of old dissected fans	Recent drainages
Slope	4 to 15 percent	4 to 15 percent	4 to 15 percent
Typical Vegetation	Fourwing Saltbush (Atriplex canescens)	Big Sagebrush (Artemisia tridentata); Goldenbush (Haplopappus spp.)	Big Sagebrush (Artemisia tridentata); Goldenbush (Haplopappus spp.)
Soil Profile Description			
Surface Layer	0 to 4 inches; pale brown very gravelly sandy loam; weak fine granular structure; strongly effervescent; moderately alkaline	0 to 3 inches; grayish brown gravelly sandy loam; weak thin platy structure; mildly alkaline	0 to 3 inches: brown gravelly sandy loam; weak fine granular structure; mildly alkaline
Subsoil	4 to 14 inches; light yellowish brown very gravelly sandy loam; massive; strongly effervescent; moderately alkaline	3 to 18 inches; yellowish brown gravelly clay loam & very gravelly loam; moderate medium subangular blocky structure; mildly to moderately alkaline	3 to 42 inches; brown and yellowish brown very gravelly sandy loam; weak medium subangular blocky structure & massive; none to slightly effervescent; mildly to moderately alkaline
Substratum	14 to 60 inches; light yellowish brown very gravelly & extremely gravelly loamy sand; massive; moderately alkaline	18 to 60 inches; discontinous duripan	42 to 60 inches; light brownish gray extremely gravelly loamy sand; massive; strongly effervescent; moderately alkaline
Soil Properties			
Restrictive Layer Depth	Greater than 60 inches	12 to 18 inches DP	Greater than 60 inches
Effective Rooting Depth (inches)	20 to 40 inches	12 to 18 inches	20 to 40 inches
Available Water Capacity	Very low to low (1.8 to 2.4 inches)	Very low to low (1.4 to 2.6 inches)	Low (2.7 to 3.6 inches)
Water Retention Class	3 (1.0 to 1.2 inches)	1 to 2 (1.4 to 2.6 inches)	2 (1.2 to 1.6 inches)
Hydrologic Soil Group	B	D	B
Permeability (in./hr.)	2.0 to 6.0	Less than 0.06	2.0 to 6.0
Drainage Class	Well drained	Well drained	Well drained
Runoff	Slow to medium	Slow to medium	Slow to medium
Max Erosion Hazard	High	High	High
Erosion Factor (k)			
Surface	0.10 (low)	0.15 (low)	0.05 (low)
Subsurface	0.17 (low)	0.24 (moderate)	0.10 (low)
T Value	2	1	4
Wind Erodability Group	8	3	3

141 - Midas - Cath - Mackey families complex (continued)

Soil Manageability Group	IV	IV	IV
Class	4EP	3Edp	3Ep

Range Interpretations

Productivity (lb/acre)	300 to 400	300 to 400	300 to 400
Suitability	Summer - Autumn	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; high erosion hazard	Plant competition; high erosion hazard	Plant competition; high erosion hazard

Recreation Interpretations - Limitations for

Camp Areas	4-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones	Severe; Percs slowly	4-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones
Picnic Areas	4-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones	4-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones	4-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones
Paths & Trails	Moderate: Small stones	Moderate: Small stones	Moderate: Small stones

Engineering Interpretations

Unified Class			
Surface	GW-GM; GM-GC	SM	SM
Subsoil	SM-SC	SC	SW-SM; SM-SC
Substratum	SW-SM; SM-SC	—	GW-GM
AASHTO Class			
Surface	A-1-a; A-1-b; A-2-4	A-1-b; A-2-4	A-1-b; A-2-4
Subsoil	A-2-4; A-4	A-2-6; A-6	A-1-a; A-1-b; A-2-4
Substratum	A-1-a; A-1-b; A-2-4	—	A-1-a; A-1-b; A-2-4
Suitability for			
Sand	Unsuited	Unsuited	Unsuited
Gravel	Unsuited	Unsuited	Unsuited
Topsoil	Poor: Small stones	Poor: Area reclaim	Poor: Small stones
Roadfill	4-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones	Fair: Low strength	Good

Included Areas & Remarks

Included in this map unit are small areas of the Washoe family, 4 to 15 percent slopes, on alluvial fans; the Midas, Cath and Mackey families, 15 to 30 percent slopes, on alluvial fans; a soil similar to the Midas family, but moister, on ballenas of older alluvial fans; and a soil similar to the Midas family, but moister and less than 20 inches to hardpan, on dissected alluvial fans and terraces. Included areas make up approximately 30 percent of the map unit area.

142 - Midas - Cath - Mackey families complex, 15 to 30 percent slopes

Elevation: 6,450 to 7,900 feet Annual Precipitation: 8 to 9 inches

Soil Map Unit Components	Midas family	Cath family	Mackey family
Approx Proportion	35 percent	25 percent	20 percent
Landscape Position	Older alluvial fans	Ridges of old dissected fans	Ballena slideslopes & drainages
Slope	15 to 30 percent	15 to 30 percent	15 to 30 percent
Typical Vegetation	Fourwing Saltbush (Atriplex canescens)	Big Sagebrush (Artemisia tridentata); Goldenbush (Haplopappus spp.)	Big Sagebrush (Artemisia tridentata); Goldenbush (Haplopappus spp.)

Soil Profile Description

Surface Layer	0 to 4 inches; pale brown very gravelly sandy loam; weak fine granular structure; strongly effervescent; moderately alkaline	0 to 3 inches; grayish brown gravelly sandy loam; weak thin platy structure; mildly alkaline	0 to 3 inches; brown gravelly sandy loam; weak fine granular structure; mildly alkaline
Subsoil	4 to 14 inches; light yellowish brown very gravelly sandy loam; massive; strongly effervescent; moderately alkaline	3 to 18 inches; yellowish brown gravelly clay loam & very gravelly loam; moderate medium subangular blocky structure; mildly to moderately alkaline	3 to 42 inches; brown and yellowish brown very gravelly sandy loam; weak medium subangular blocky structure & massive; none to slighty effervescent; mildly to moderately alkaline
Substratum	14 to 60 inches; light yellowish brown very gravelly & extremely gravelly loamy sand; massive; moderately alkaline	18 to 60 inches; discontinous duripan	42 to 60 inches; light brownish gray extremely gravelly loamy sand; massive; strongly effervescent; moderately alkaline

Soil Properties

Restrictive Layer Depth	Greater than 60 inches	12 to 18 inches DP	Greater than 60 inches
Effective Rooting Depth (inches)	20 to 40 inches	12 to 18 inches	20 to 40 inches
Available Water Capacity	Very low to low (1.8 to 2.4 inches)	Very low to low (1.4 to 2.6 inches)	Low (2.7 to 3.6 inches)
Water Retention Class	3 (1.0 to 1.2 inches)	1 to 2 (1.4 to 2.6 inches)	2 (1.2 to 1.6 inches)
Hydrologic Soil Group	B	D	B
Permeability (in./hr.)	2.0 to 6.0	0.2 to 0.6	2.0 to 6.0
Drainage Class	Well drained	Well drained	Well drained
Runoff	Rapid	Rapid	Rapid
Max Erosion Hazard	High to very high	High	High
Erosion Factor (k)			
Surface	0.10 (low)	0.15 (low)	0.05 (low)
Subsurface	0.17 (low)	0.24 (moderate)	0.10 (low)
T Value	2	1	4
Wind Erodability Group	8	3	3

142 - Midas - Cath - Mackey families complex (continued)

Soil Manageability			
Group	IV	IV	IV
Class	4EP	3Edp	3Ep

Range Interpretations

Productivity (lb/acre)	300 to 400	300 to 400	300 to 400
Suitability	Summer - Autumn	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; high erosion hazard	Plant competition; high erosion hazard	Plant competition; high erosion hazard

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; Percs slowly	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope	Severe: Slope
Paths & Trails	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - slope	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - slope	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - slope

Engineering Interpretations

Unified Class			
Surface	GW-GM; GM-GC	SM	SM
Subsoil	SM-SC	SC	SW-SM; SM-SC
Substratum	SW-SM; SM-SC	—	GW-GM
AASHTO Class			
Surface	A-1-a; A-1-b; A-2-4	A-1-b; A-2-4	A-1-b; A-2-4
Subsoil	A-2-4; A-4	A-2-6; A-6	A-1-a; A-1-b; A-2-4
Substratum	A-1-a; A-1-b; A-2-4	—	A-1-a; A-1-b; A-2-4
Suitability for			
Sand	Unsuited	Unsuited	Unsuited
Gravel	Unsuited	Unsuited	Unsuited
Topsoil	Poor: Slope; Small stones	Poor: Slope; Area reclaim	Poor: Slope; Small stones
Roadfill	15-25% slopes: Fair - slope 25-30% slopes: Poor - slope; small stones	15-25% slopes: Fair - slope; low strength 25-30% slopes: Poor - slope	15-25% slopes: Fair - slope 25-30% slopes: Poor - slope

Included Areas & Remarks

Included in this map unit are small areas of the Washoe family, on alluvial fans; a soil similar to the Midas family, but moister, 9 to 15 percent slopes, on ballenas of old alluvial fans; and a soil similar to the Midas family, but moister and less than 20 inches deep to hardpan, on dissected alluvial fans and terraces. Included areas make up approximately 20 percent of the map unit area.

143 - Moano family - Rock outcrop, sedimentary complex, 60 to 80 percent slopes

Elevation: 4,700 to 8,000 feet Annual Precipitation: 8 inches

Soil Map Unit Components	Moano family	Rock outcrop, sedimentary
Approx Proportion	40 percent	40 percent
Landscape Position	Ridgetops & mountainsides	Ridgetops & mountainsides
Slope	60 to 80 percent	—
Typical Vegetation	Singleaf Pinyon Pine (Pinus monophylla); Big Sagebrush Artemisia tridentata)	—

Soil Profile Description

Surface Layer	0 to 3 inches; light yellowish brown loam; weak fine granular structure; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	3 to 12 inches; brownish yellow very cobbly clay loam; massive; moderately alkaline	—
	12 inches; hard quartzitic sandstone bedrock	

Soil Properties

Restrictive Layer Depth	12 to 14 inches HB	—
Effective Rooting Depth (inches)	12 to 14 inches	—
Available Water Capacity	Very low (1.3 to 2.0 inches)	—
Water Retention Class	2 (1.3 to 2.0 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	0.2 to 0.6	—
Drainage Class	Well drained	—
Runoff	Very Rapid	—
Max Erosion Hazard	High	—
Erosion Factor (k)		
Surface	0.15 (low)	—
Subsurface	0.15 (low)	
T Value	1	—
Wind Erodability Group	8	—

143 - Moano family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4EGXdp	—

Range Interpretations

Productivity (lb/acre)	300 to 500	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 40% shallow soils; 40% rock outcrop; high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	CL	—
Subsoil	—	—
Substratum	SC	—
AASHTO Class		
Surface	A-4	—
Subsoil	—	—
Substratum	A-6	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; small stones; area reclaim	—
Roadfill	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Finley family, on stable mid to lower mountainsides; and a soil similar to the Trocken family, but moister, on mid to lower mountainsides. Included areas make up approximately 20 percent of the map unit area.

Rock outcrop percentage includes rubbleland.

144 - Mulett - Checkett families - Rock outcrop, granitic complex, 60 to 80 percent slopes

Elevation: 5,200 to 7,800 feet Annual Precipitation: 8 inches

Soil Map Unit Components	Mulett family	Checkett family	Rock outcrop, granitic
Approx Proportion	30 percent	30 percent	20 percent
Landscape Position	Mountainsides	Mountainsides	Ridges & mountainsides
Slope	60 to 80 percent	60 to 80 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	—

Soil Profile Description

Surface Layer	0 to 6 inches; pale brown sandy loam & very gravelly sandy clay loam; weak fine granular structure; mildly alkaline	0 to 6 inches; pale brown gravelly fine sandy loam; weak fine granular structure; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	6 to 13 inches; light yellowish brown very gravelly clay loam; moderate medium subangular blocky structure; mildly alkaline	6 to 19 inches; yellowish brown very gravelly & very cobbly sandy clay loam; moderate medium subangular blocky structure; moderately alkaline	—
Substratum	13 inches; hard noncalcareous sedimentary bedrock	19 inches; hard metasedimentary bedrock	—

Soil Properties

Restrictive Layer Depth	10 to 20 inches HB	9 to 19 inches HB	—
Effective Rooting Depth (inches)	10 to 20 inches	9 to 19 inches	—
Available Water Capacity	Very low to low (1.0 to 2.5 inches)	Very low to low (0.8 to 2.1 inches)	—
Water Retention Class	1 to 3 (1.0 to 2.5 inches)	2 to 3 (0.8 to 2.1 inches)	—
Hydrologic Soil Group	D	D	—
Permeability (in./hr.)	0.2 to 0.6	0.2 to 0.6	—
Drainage Class	Well drained	Well drained	—
Runoff	Very rapid	Very rapid	—
Max Erosion Hazard	High	High	—
Erosion Factor (k)			
Surface	0.15 (low)	0.15 (low)	—
Subsurface	0.10 (low)	0.10 (low)	—
T Value	1	1	—
Wind Erodability Group	3	8	—

144 - Mulett - Checkett families - Rock outcrop (continued)

Soil Manageability Group	IV	IV	IV
Class	4EGXdp	4EGPXd	—

Range Interpretations

Productivity (lb/acre)	300 to 500	300 to 500	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; 60% shallow soils; 20% rock outcrop; high erosion hazard; very steep slopes	Plant competition; 60% shallow soils; 20% rock outcrop; high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; Too sandy	—
Picnic Areas	Severe: Slope	Severe: Slope; Too sandy	—
Paths & Trails	Severe: Slope	Severe: Slope; Too sandy	—

Engineering Interpretations

Unified Class			
Surface	SM-SC	SM-SC	—
Subsoil	SC	SC	—
Substratum	—	—	—
AASHTO Class			
Surface	A-2-4	A-2-4; A-4	—
Subsoil	A-2-6	A-2-4	—
Substratum	—	—	—
Suitability for			
Sand	Unsuited	Unsuited	—
Gravel	Unsuited	Unsuited	—
Topsoil	Poor: Slope; small stones; area reclaim	Poor: Slope; small stones	—
Roadfill	Poor: Slope; area reclaim	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Mexispring family, but calcareous, on mountainsides at lower elevations; a soil similar to the Packham family, but slightly drier, on mountainsides at higher elevations; and rubbleland, on mountainsides. Included areas make up approximately 20 percent of the map unit area.

145 - Mulett - Toeja families - Rubbleland association, 15 to 80 percent slopes

Elevation: 7,120 to 9,370 feet Annual Precipitation: 8 to 11 inches

Soil Map Unit Components	Mulett family	Toeja family	Rubbleland
Approx Proportion	40 percent	25 percent	15 percent
Landscape Position	Southerly & westerly-facing mountainsides	Mountain tops & benches	Mountainsides, mostly on northerly & easterly facing aspects
Slope	30 to 80 percent	15 to 30 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Curlleaf Mountain Mahogany (Cercocarpus ledifolius) Big Sagebrush (Artemisia tridentata)	—
Soil Profile Description			
Surface Layer	0 to 6 inches; pale brown sandy loam & very gravelly sandy clay loam; weak fine granular structure; mildly alkaline	1 to 0 inch; Litter 0 to 12 inches; light brownish gray & grayish brown very cobbly sandy loam & gravelly loam; weak very coarse platy & weak medium subangular blocky structure; moderately alkaline	Rubbleland consists of areas of detached rock fragments (colluvium) which have accumalated on steep to very steep mountainsides as talus. These areas support little or no vegetation and are subject to landslides
Subsoil	6 to 13 inches; light yellowish brown very gravelly clay loam; moderate medium subangular blocky structure; mildly alkaline	12 to 22 inches; yellowish brown gravelly sandy clay loam; strong fine & medium subangular blocky structure; moderately alkaline	—
Substratum	13 inches; hard noncalcareous sedimentary bedrock	22 inches; Weathered rhyolite (paralithic contact)	—
Soil Properties			
Restrictive Layer Depth	10 to 20 inches HB	21 to 24 inches PARA	—
Effective Rooting Depth (inches)	10 to 20 inches	21 to 24 inches	—
Available Water Capacity	Very low to low (1.0 to 2.5 inches)	Low (2.4 to 3.4 inches)	—
Water Retention Class	1 to 3 (1.0 to 2.5 inches)	1 to 2 (2.1 to 2.7 inches)	—
Hydrologic Soil Group	D	C	—
Permeability (in./hr.)	0.2 to 0.6	0.2 to 0.6	—
Drainage Class	Well drained	Well drained	—
Runoff	Rapid to very rapid	Rapid	—
Max Erosion Hazard	Moderate to High	High	—
Erosion Factor (k) Surface Subsurface	 0.15 (low) 0.10 (low)	 0.10 (low) 0.28 (moderate)	 — —
T Value	1	2	—
Wind Erodability Group	3	8	—

145 - Mulett - Toeja families - Rubbleland association (continued)

Soil Manageability Group	IV	IV	IV
Class	4EGdpx	3Ex	—

Range Interpretations

Productivity (lb/acre)	300 to 500	600 to 1000	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; 65% shallow soils; 15% rubbleland; high erosion hazard; very steep slopes	Plant competition; 65% shallow soils; 15% rubbleland; high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope	—
Picnic Areas	Severe: Slope	Severe: Slope	—
Paths & Trails	Severe: Slope	15-25% slopes: Moderate - slope; large stones 25-30% slopes: Severe - slope	—

Engineering Interpretations

Unified Class			
Surface	SM-SC	SM	—
Subsoil	SC	SM	—
Substratum	—	—	—
AASHTO Class			
Surface	A-2-4	A-4	—
Subsoil	A-2-6	A-2-7	—
Substratum	—	—	—
Suitability for			
Sand	Unsuited	Poor: Excess fines	—
Gravel	Unsuited	Unsuited	—
Topsoil	Poor: Slope; small stones; area reclaim	Poor: Slope; small stones	—
Roadfill	Poor: Slope; area reclaim	15-25% slopes: Poor - area reclaim 25-30% slopes: Poor - slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Sumine family, 30 to 60 percent slopes, on northerly and easterly-facing mountain toeslopes; and the Hartig family, 60 to 80 percent slopes, on upper mountainsides. Included areas make up approximately 20 percent of the map unit area.

Rubbleland is andesite.

146 - Packham - Slinger families - Rock outcrop, granitic association, 30 to 60 percent slopes

Elevation: 6,400 to 12,320 feet Annual Precipitation: 11 inches

Soil Map Unit Components	Packham family	Slinger family	Rock outcrop, granitic
Approx Proportion	30 percent	20 percent	20 percent
Landscape Position	Northerly and easterly-facing mountainsides	Southerly and westerly-facing mountainsides	Mountainsides, ridges and canyon escarpments
Slope	30 to 60 percent	30 to 60 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	—

Soil Profile Description

Surface Layer	0 to 3 inches; pale brown extremely cobbly sandy loam; moderate very thin platy structure; neutral	1 to 0 inch; Litter 0 to 14 inches; pale brown very gravelly sandy loam; weak fine granular structure & massive; slightly to strongly effervescent; mildly alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	3 to 15 inches; yellowish brown very gravelly & extremely gravelly sandy clay loam; massive; neutral	—	—
Substratum	15 to 60+ inches; light yellowish brown & very pale brown gravelly & extremely gravelly sandy loam; massive; none to violently effervescent; neutral to moderately alkaline	14 to 60 inches; light gray, very pale brown very gravelly sandy loam; massive; violently effervescent; moderately alkaline	—

Soil Properties

Restrictive Layer Depth	30 to 60 inches FB	35 to 60+ inches FB	—
Effective Rooting Depth (inches)	20 to 50 inches	35 to 60 inches	—
Available Water Capacity	Very low to low (1.3 to 3.3 inches)	Very low to low (1.7 to 3.5 inches)	—
Water Retention Class	2 to 3 (1.0 to 1.2 inches)	2 (1.2 to 1.4 inches)	—
Hydrologic Soil Group	B	B	—
Permeability (in./hr.)	0.2 to 0.6	2.0 to 6.0	—
Drainage Class	Well drained	Well drained	—
Runoff	Rapid to very rapid	Rapid to very rapid	—
Max Erosion Hazard	Moderate to High	Moderate to High	—
Erosion Factor (k)			
Surface	0.05 (low)	0.10 (low)	—
Subsurface	0.05 (low)	0.10 (low)	—
T Value	3	4	—
Wind Erodability Group	8	8	—

146 - Packham - Slinger families - Rock outcrop (continued)

Soil Manageability Group	IV	IV	IV
Class	4PXeg	3Xegp	—

Range Interpretations

Productivity (lb/acre)	500 to 700	500 to 700	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; 20% rock outcrop; high erosion hazard; steep slopes	Plant competition; 20% rock outcrop; high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope	—
Picnic Areas	Severe: Slope	Severe: Slope	—
Paths & Trails	Severe: Slope; large stones	Severe: Slope	—

Engineering Interpretations

Unified Class			
Surface	GM; GW-GM	SM; SW-SM	—
Subsoil	GM; GW-GM	—	—
Substratum	GM; GW-GM	GM; GW-GM	—
AASHTO Class			
Surface	A-1-a; A-1-b; A-2-4	A-1-a; A-1-b; A-2-4	—
Subsoil	A-2-6	—	—
Substratum	A-1-a; A-1-b; A-2-4	A-1-a; A-1-b; A-2-4	—
Suitability for			
Sand	Unsuited	Unsuited	—
Gravel	Poor: Excess fines	Poor: Excess fines	—
Topsoil	Poor: Slope; small stones	Poor: Slope; small stones	—
Roadfill	Poor: Slope	Poor: Slope	—

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Soakpak family, but warmer, 30 to 80 percent slopes, on upper mountainsides at elevations of greater than 9,500 feet; a soil similar to the Moano family, but moister, 50 to 75 percent slopes, on steep eroded mountainsides; and granitic rubbleland, directly beneath rock outcropping. Included areas make up approximately 30 percent of the map unit area.

147 - Packham - Spaa families - Rock outcrop, granitic association, 30 to 60 percent slopes

Elevation: 6,000 to 9,400 feet Annual Precipitation: 9 to 11 inches

Soil Map Unit Components	Packham family	Spaa family	Rock outcrop, granitic
Approx Proportion	35 percent	25 percent	15 percent
Landscape Position	Southerly and westerly-facing mountainsides	Northerly and easterly-facing mountainsides	Ridges and mountainsides
Slope	30 to 60 percent	30 to 60 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata); Wheatgrass (Agropyron spp.)	Curlleaf Mountain Mahogany (Cercocarpus leditolius); Big Sagebrush (Artemisia tridentata)	—

Soil Profile Description

Surface Layer	0 to 3 inches; pale brown extremely cobbly sandy loam; moderate very thin platy structure; neutral	0 to 3 inches: brown very cobbly sandy loam; weak medium & coarse platy structure; medium acid	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	3 to 15 inches; yellowish brown very gravelly & extremely gravelly sandy clay loam; massive; neutral	—	—
Substratum	15 to 60+ inches; light yellowish brown & very pale brown gravelly & extremely gravelly sandy loam; massive; none to violently effervescent; neutral to moderately alkaline	3 to 16 inches; brown & pale brown sandy loam & gravelly sandy loam; weak fine & medium sugangular blocky structure; slightly acid 16 inches; hard rhyolite bedrock	—

Soil Properties

Restrictive Layer Depth	30 to 60+ inches FB	12 to 16 inches HB	—
Effective Rooting Depth (inches)	20 to 50 inches	10 to 16 inches	—
Available Water Capacity	Very low to low (1.3 to 3.3 inches)	Very low (0.9 to 1.6 inches)	—
Water Retention Class	2 to 3 (1.0 to 1.2 inches)	2 to 3 (0.9 to 1.6 inches)	—
Hydrologic Soil Group	B	D	—
Permeability (in./hr.)	0.2 to 0.6	2.0 to 6.0	—
Drainage Class	Well drained	Well drained	—
Runoff	Rapid to very rapid	Rapid to very rapid	—
Max Erosion Hazard	Moderate to High	High	—
Erosion Factor (k)			
Surface	0.05 (low)	0.10 (low)	—
Subsurface	0.05 (low)	0.24 (moderate)	—
T Value	3	1	—
Wind Erodability Group	8	8	—

147 - Packham - Spaa families - Rock outcrop (continued)

Soil Manageability			
Group	III	III	III
Class	3Pegx	4EPdgx	—

Range Interpretations

Productivity (lb/acre)	500 to 700	600 to 1000	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; 25% shallow soils; 15% rock outcrop; high erosion hazard; steep slopes	Plant competition; 25% shallow soils; 15% rock outcrop; high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope	—
Picnic Areas	Severe: Slope	Severe: Slope	—
Paths & Trails	Severe: Slope; large stones	Severe: Slope	—

Engineering Interpretations

Unified Class			
Surface	GM; GW-GM	SM; SW-SM	—
Subsoil	GM; GW-GM	—	—
Substratum	GM; GW-GM	SM	—
AASHTO Class			
Surface	A-1-a; A-1-b; A-2-4	A-1-b; A-2-4	—
Subsoil	A-2-6	—	—
Substratum	A-1-a; A-1-b; A-2-4	A-2-4	—
Suitability for			
Sand	Unsuited	Poor: Excess fines	—
Gravel	Poor: Excess fines	Unsuited	—
Topsoil	Poor: Slope; small stones	Poor: Slope; small stones; area reclaim	—
Roadfill	Poor: Slope	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Bartine family, on northerly and easterly-facing mountainsides, at higher elevations; a soil similar to the Spaa family, but shallow to soft bedrock, on southerly and westerly-facing mountainsides; and a soil similar to the St. Marys family, but warmer and with a thicker dark surface layer, on 15 to 30 percent slopes, in floodplains between mountainsides. Included areas make up approximately 25 percent of the map unit area.

148 - Pergelic Cryoborolls - Rock outcrop, metasedimentary association, 30 to 60 percent slopes

Elevation: 9,000 to 13,100 feet Annual Precipitation: 15 to 18 inches

Soil Map Unit Components	Pergelic Cryoborolls	Rock outcrop, metasedimentary
Approx Proportion	55 percent	25 percent
Landscape Position	Mountainsides	Ridges and upper mountainsides
Slope	30 to 60 percent	—
Typical Vegetation	Goldenbush (Haplopappus spp.); Pringle Bluegrass (Poa pringleii); Buckwheat (Eriogonum spp.)	—

Soil Profile Description

Surface Layer	1 to 0 inches; Root mat 0 to 2 inches; dark grayish brown very stony loam; moderate medium & coarse subangular blocky structure; neutral	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	2 to 14 inches; brown & yellowish brown very stony loam; moderate fine, medium & coarse subangular blocky structure; neutral to slightly acid	—
Substratum	14 to 39 inches; pale brown very stony & extremely stony loam; moderate fine & medium subangular blocky structure; slightly to strongly acid 39 inches; hard fractured granodiorite bedrock	—

Soil Properties

Restrictive Layer Depth	35 to 60+ inches FB	—
Effective Rooting Depth (inches)	20 to 40 inches	—
Available Water Capacity	Low (2.0 to 3.5 inches)	—
Water Retention Class	2 (1.4 to 1.8 inches)	—
Hydrologic Soil Group	B	—
Permeability (in./hr.)	0.6 to 2.0	—
Drainage Class	Well drained	—
Runoff	Rapid to Very Rapid	—
Max Erosion Hazard	High	—
Erosion Factor (k)		
Surface	0.17 (low)	—
Subsurface	0.10 (low)	—
T Value	4	—
Wind Erodability Group	8	—

148 - Pergelic Cryoborolls - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4EXgp	—

Range Interpretations

Productivity (lb/acre)	75 to 100	—
Suitability	Summer	—
Most Limiting Factors	20% rock outcrop; 10% rubbleland; high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope; large stones	—

Engineering Interpretations

Unified Class		
Surface	SM	—
Subsoil	SC	—
Substratum	SM-SC	—
AASHTO Class		
Surface	A-4	—
Subsoil	A-2-4	—
Substratum	A-4	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; large & small stones	—
Roadfill	Poor: Slope; large stones; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Soakpak family, 5 to 30 percent slopes, on alluvial-colluvial flats; and metasedimentary rubbleland, in concave positions, below rock outcroppings. Included areas make up approximately 20 percent of the map unit area.

149 - Pergelic Cryoborolls - Rubbleland, metasedimentary complex, 30 to 60 percent slopes

Elevation: 10,900 to 12,400 feet Annual Precipitation: 12 to 18 inches

Soil Map Unit Components	Pergelic Cryoborolls	Rubbleland, metasedimentary
Approx Proportion	40 percent	40 percent
Landscape Position	Mountainsides	Mountainsides
Slope	30 to 60 percent	—
Typical Vegetation	Goldenbush (Haplopappus spp.); Pringle Bluegrass (Poa pringleii); Buckwheat (Eriogonum spp.)	—

Soil Profile Description

Surface Layer	1 to 0 inches; Root mat 0 to 2 inches; dark grayish brown very stony loam; moderate medium & coarse subangular blocky structure; neutral	Rubbleland consists of areas of detached rock fragments (colluvium) which have accumulated on steep to very steep mountainsides as talus. These areas support little or no vegetation and are subject to landslides.
Subsoil	2 to 14 inches; brown, yellowish brown very stony loam; moderate fine, medium & coarse subangular blocky structure; neutral to slightly acid	—
Substratum	14 to 39 inches; pale brown very stony & extremely stony loam; moderate fine & medium subangular blocky structure; slightly to strongly acid 39 inches; hard fractured granodiorite bedrock	—

Soil Properties

Restrictive Layer Depth	35 to 60+ inches FB	—
Effective Rooting Depth (inches)	20 to 40 inches	—
Available Water Capacity	Low (2.0 to 3.5 inches)	
Water Retention Class	2 (1.4 to 1.8 inches)	—
Hydrologic Soil Group	B	—
Permeability (in./hr.)	0.6 to 2.0	—
Drainage Class	Well drained	—
Runoff	Rapid to Very Rapid	—
Max Erosion Hazard	High	—
Erosion Factor (k)		
Surface	0.17 (low)	—
Subsurface	0.10 (low)	—
T Value	4	—
Wind Erodability Group	8	—

149 - Pergelic Cryoborolls - Rubbleland (continued)

Soil Manageability		
Group	IV	IV
Class	4EXgp	—

Range Interpretations

Productivity (lb/acre)	75 to 100	—
Suitability	Summer	—
Most Limiting Factors	40% rubbleland; high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope; large stones	—

Engineering Interpretations

Unified Class		
Surface	SM	—
Subsoil	SC	—
Substratum	SM-SC	—
AASHTO Class		
Surface	A-4	—
Subsoil	A-2-4	—
Substratum	A-4	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; large & small stones	—
Roadfill	Poor: Slope; large stones; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of Swift Creek family and dolomite rock outcrop. Included areas make up approximately 20 percent of the map unit area.

150 - Pergelic Cryoborolls - Soakpak family association, 5 to 70 percent slopes

Elevation: 10,800 to 13,200 feet Annual Precipitation: 12 to 18 inches

Soil Map Unit Components	Pergelic Cryoborolls	Soakpak family
Approx Proportion	55 percent	25 percent
Landscape Position	Mountainsides	Colluvial-alluvial mountain flats
Slope	30 to 70 percent	5 to 30 percent
Typical Vegetation	Goldenbush (Haplopappus spp.); Buckwheat (Eriogonum spp.); Pringle Bluegrass (Poa pringlei)	Carex (Carex spp.); Low Phlox (Phlox hoodii); Pringle Bluegrass (Poa pringlei)

Soil Profile Description

Surface Layer	1 to 0 inches; Root mat 0 to 2 inches; dark grayish brown very stony loam; moderate medium & coarse subangular blocky structure; neutral	0 to 9 inches; grayish brown & brown, extremely cobbly & very gravelly sandy loam; moderate fine & medium, & weak very fine & fine subangular blocky structure; slightly to medium acid
Subsoil	2 to 14 inches; brown & yellowish brown very stony loam; moderate fine, medium & coarse subangular blocky structure; neutral to slightly acid	9 to 27 inches; pale brown very gravelly sandy loam; weak very fine & fine subangular blocky structure; medium acid
Substratum	14 to 39 inches; pale brown very stony & extremely stony loam; moderate fine & medium subangular blocky structure; slightly to strongly acid 39 inches; hard fractured granodiorite bedrock	27 to 42 inches; light gray very gravelly sandy loam; weak very fine & fine subangular blocky structure; medium acid 42 inches; hard fractured granodiorite bedrock

Soil Properties

Restrictive Layer Depth	35 to 60+ inches FB	30 to 60+ inches FB
Effective Rooting Depth (inches)	20 to 40 inches	20 to 40 inches
Available Water Capacity	Low (2.0 to 3.5 inches)	Very low to moderate (1.7 to 4.2 inches)
Water Retention Class	2 (1.4 to 1.8 inches)	2 (1.3 to 1.6 inches)
Hydrologic Soil Group	B	B
Permeability (in./hr.)	0.6 to 2.0	0.6 to 2.0
Drainage Class	Well drained	Well drained
Runoff	Rapid to Very Rapid	Medium to Rapid
Max Erosion Hazard	High	Moderate
Erosion Factor (k)		
Surface	0.17 (low)	0.17 (low)
Subsurface	0.10 (low)	0.10 (low)
T Value	4	4
Wind Erodability Group	8	8

150 - Pergelic Cryoborolls - Soakpak family association (continued)

Soil Manageability		
Group	III	III
Class	3Egpx	2epx

Range Interpretations

Productivity (lb/acre)	75 to 100	75 to 100
Suitability	Summer	Summer
Most Limiting Factors	10% rock outcrop; high erosion hazard; steep slopes	10% rock outcrop; high erosian hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	5-8% slopes: Moderate - large & small stones 8-15% slopes: Moderate - slope; large & small stones
Picnic Areas	Severe: Slope	5-8% slopes: Moderate - large & small stones 8-15% slopes: Moderate - slope; large & small stones
Paths & Trails	Severe: Slope; large stones	Moderate: Large & small stones

Engineering Interpretations

Unified Class		
Surface	SM	SM-SC
Subsoil	SC	GW-GM; GM-GC
Substratum	SM-SC	GW-GM; GM-GC
AASHTO Class		
Surface	A-4	A-4
Subsoil	A-2-4	A-2-4
Substratum	A-4	A-1-a; A-1-b; A-2-4
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Unsuited	Poor: Excess fines
Topsoil	Poor: Slope; large & small stones	Poor: Small stones
Roadfill	Poor: Slope; large stones; area reclaim	Fair: area reclaim

Included Areas & Remarks

Included in this map unit are small areas of the Soakpak family, 30 to 50 percent slopes, on transitional areas between colluvial-alluvial flats and mountainsides; Pergelic Cryoborolls, 5 to 30 percent slopes, on benches of mountainsides; and rock outcrop, on ridges and mountain tops. Included areas make up approximately 20 percent of the map unit area.

151 - Preston family, 1 to 15 percent slopes

Elevation: 6,430 to 7,640 feet Annual Precipitation: 10 inches

Soil Map Unit Components	**Preston family**
Approx Proportion	80 percent
Landscape Position	Stabilized sand dunes
Slope	1 to 15 percent
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Indian Ricegrass (Oryzopsis hymenoides)

Soil Profile Description

Surface Layer	0 to 6 inches; pale brown sand; weak very fine granular structure & single grained; neutral
Subsoil	—
Substratum	6 to 60 inches; pale brown, light brownish gray, light gray fine sand and sand; single grained; neutral

Soil Properties

Restrictive Layer Depth	Greater than 60 inches
Effective Rooting Depth (inches)	40 to 60 inches
Available Water Capacity	Low to moderate (3.0 to 4.8 inches)
Water Retention Class	2 to 3 (1.0 to 1.6 inches)
Hydrologic Soil Group	A
Permeability (in./hr.)	6.0 to 20.0
Drainage Class	Somewhat Excessive
Runoff	Slow to Medium
Max Erosion Hazard	Moderate
Erosion Factor (k)	
Surface	0.10 (low)
Subsurface	0.10 (low)
T Value	3
Wind Erodability Group	1

151 - Preston family (continued)

Soil Manageability	
Group	III
Class	3Pe

Range Interpretations

Productivity (lb/acre)	400 to 800
Suitability	Summer - Autumn
Most Limiting Factors	Plant competition; 30% shallow soils; 5% rock outcrop

Recreation Interpretations - Limitations for

Camp Areas	Severe: Too sandy
Picnic Areas	Severe: Too sandy
Paths & Trails	Severe: Too sandy

Engineering Interpretations

Unified Class	
Surface	SM; SW-SW
Subsoil	—
Substratum	SM
AASHTO Class	
Surface	A-2-4
Subsoil	—
Substratum	A-2-4
Suitability for	
Sand	Poor: Excess fines
Gravel	Unsuited
Topsoil	Poor: Too sandy
Roadfill	Good

Included Areas & Remarks

Included in this map unit are small areas of Durargidic Argixerolls, 9 to 15 percent slopes, in transitional areas between sand dunes; the Wrango family, 5 to 15 percent slopes, on alluvial transitional areas; and a soil similar to the Wrango family, but with stratified layers, in alluvial drainageways. Included areas make up approximately 20 percent of the map unit area.

152 - Risue - Abgese - Preston families association, 2 to 15 percent slopes

Elevation: 6,680 to 7,920 feet Annual Precipitation: 10 inches

Soil Map Unit Components	Risue family	Abgese family	Preston family
Approx Proportion	30 percent	25 percent	25 percent
Landscape Position	Lava flows	Sideslopes of lava flows	Depressions
Slope	2 to 10 percent	9 to 15 percent	2 to 5 percent
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Rabbitbrush (Chryothamnus spp.)	Big Sagebrush (Artemisia tridentata); Singleleaf Pinyon Pine (Pinus monophylla)	Big Sagebrush (Artemisia tridentata); Indian Ricegrass (Oryzopsis hymenoides)
Soil Profile Description			
Surface Layer	0 to 6 inches; pale brown cobbly loamy sand & loamy sand; weak very fine granular & weak fine & medium subangular blocky structure; neutral	0 to 5 inches; brown sandy loam; weak fine granular structure; mildly alkaline	0 to 6 inches; pale brown sand; weak very fine granular structure & single grained; neutral
Subsoil	6 to 16 inches; yellowish brown, brown sandy clay loam & clay; strong very fine, fine, medium & coarse subangular blocky structure; neutral	5 to 16 inches; yellowish brown sandy loam & gravelly sandy loam; moderate medium subangular blocky structure & massive; mildly alkaline	—
Substratum	16 inches; strong brown silica-cemented hardpan	16 to 60 inches; yellowish brown very gravelly sandy loam; massive; mildly alkaline	6 to 60 inches; pale brown, light brownish gray, light gray fine sand & sand; single grained; neutral
Soil Properties			
Restrictive Layer Depth	16 inches DP	Greater than 60 inches	Greater than 60 inches
Effective Rooting Depth (inches)	16 inches	40 to 60 inches	40 to 60 inches
Available Water Capacity	Very low (1.6 to 2.0 inches)	Moderate (4.6 to 5.7 inches)	Low to moderate (3.0 to 4.8 inches)
Water Retention Class	2 (1.6 to 2.0 inches)	2 (1.7 to 2.1 inches)	2 to 3 (1.0 to 1.6 inches)
Hydrologic Soil Group	D	B	A
Permeability (in./hr.)	Less than 0.06	2.0 to 6.0	6.0 to 20.0
Drainage Class	Well drained	Well drained	Somewhat Excessive
Runoff	Slow to Medium	Medium	Slow to Medium
Max Erosion Hazard	Moderate	Moderate	Moderate
Erosion Factor (k)			
Surface	0.10 (low)	0.15 (low)	0.10 (low)
Subsurface	0.15 (low)	0.17 (low)	0.10 (low)
T Value	1	3	3
Wind Erodability Group	8	3	1

152 - Risue - Abgese - Preston families association (continued)

Soil Manageability Group	II	II	II
Class	2edpx	2epx	3Pex

Range Interpretations

Productivity (lb/acre)	500 to 700	500 to 700	400 to 800
Suitability	Summer - Autumn	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 30% shallow soils; 5% rock outcrop	Plant competition; 30% shallow soils; 5% rock outcrop	Plant competition; 30% shallow soils; 5% rock outcrop

Recreation Interpretations - Limitations for

Camp Areas	Severe: Percs slowly	Moderate: Slope	Severe: Too sandy
Picnic Areas	2-8% slopes: Moderate - small stones; too sandy 8-10% slopes: Moderate - slope; small stones; too sandy	Moderate: Slope	Severe: Too sandy
Paths & Trails	Moderate: Large stones; too sandy	Slight	Severe: Too sandy

Engineering Interpretations

Unified Class			
Surface	SM	SM-SC	SM; SW-SM
Subsoil	ML	SM-SC	—
Substratum	SC	SM	SM
AASHTO Class			
Surface	A-2-4	A-2-4	A-2-4
Subsoil	A-7-6	A-2-4	—
Substratum	A-4	A-1-b; A-2-4	A-2-4
Suitability for			
Sand	Unsuited	Unsuited	Poor: Excess fines
Gravel	Unsuited	Unsuited	Unsuited
Topsoil	Poor: area reclaim	Fair: Slope; small stones	Poor: Too sandy
Roadfill	Poor: Low strength; area reclaim	Good	Good

Included Areas & Remarks

Included in this map unit are small areas of the Abgese family, with an overburden of the Preston family, 9 to 15 percent slopes, on sideslopes of lava flows; Abgese family, 15 to 30 percent slopes, on sideslopes of lava flows; and basalt rock outcrop and cindercones, on protrusions throughout the unit. Included areas make up approximately 20 percent of the map unit area.

153 - Risue - Berent families association, 2 to 15 percent slopes

Elevation: 6,800 to 7,300 feet Annual Precipitation: 10 to 11 inches

Soil Map Unit Components	Risue family	Berent family
Approx Proportion	65 percent	25 percent
Landscape Position	Lava flows	Depressions
Slope	5 to 15 percent	2 to 5 percent
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Rabbitbrush (Chryothamnus spp.)	Big Sagebrush (Artemisia tridentata); Antelope Bitterbrush (Purshia tridentata)

Soil Profile Description

Surface Layer	0 to 6 inches; pale brown cobbly loamy sand & loamy sand; weak very fine granular & weak fine & medium subangular blocky structure; neutral	0 to 13 inches; pale brown & brown loamy sand & gravelly medium sand; weak fine subangular blocky structure & massive; moderately alkaline
Subsoil	6 to 16 inches; yellowish brown, brown sandy clay loam & clay; strong very fine, fine, medium & coarse subangular blocky structure; neutral	—
Substratum	16 inches; strong brown silica-cemented hardpan	13 to 60 inches; pale brown & light yellowish brown loamy fine sand, medium sand & gravelly sandy loam; massive; moderately alkaline

Soil Properties

Restrictive Layer Depth	16 inches DP	Greater than 60 inches
Effective Rooting Depth (inches)	16 inches	20 to 40 inches
Available Water Capacity	Very low (1.6 to 2.0 inches)	Low to moderate (3.8 to 5.0 inches)
Water Retention Class	2 (1.6 to 2.0 inches)	2 to 3 (1.1 to 1.6 inches)
Hydrologic Soil Group	D	A
Permeability (in./hr.)	Less than 0.06	2.0 to 6.0
Drainage Class	Well drained	Well drained
Runoff	Medium	Slow
Max Erosion Hazard	Moderate	High
Erosion Factor (k)		
Surface	0.10 (low)	0.15 (low)
Subsurface	0.15 (low)	0.10 (low)
T Value	1	4
Wind Erodability Group	8	2

153 - Risue - Berent families association (continued)

Soil Manageability Group	II	II
Class	2edp	3Ep

Range Interpretations

Productivity (lb/acre)	500 to 700	300 to 400
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 65% shallow soils; high erosion hazard	Plant competition; 65% shallow soils; high erosion hazard

Recreation Interpretations - Limitations for

Camp Areas	Severe: Percs slowly	Moderate: Too sandy
Picnic Areas	2-8% slopes: Moderate - small stones; too sandy 8-15% slopes: Moderate - slope; small stones; too sandy	Severe: Too sandy
Paths & Trails	Moderate: Large stones; too sandy	Moderate: Too sandy

Engineering Interpretations

Unified Class		
Surface	SM	SM; SW-SM
Subsoil	ML	—
Substratum	SC	SM; SW-SM
AASHTO Class		
Surface	A-2-4	A-2-4
Subsoil	A-7-6	—
Substratum	A-4	A-2-4
Suitability for		
Sand	Unsuited	Poor: Excess fines
Gravel	Unsuited	Unsuited
Topsoil	Poor: area reclaim	Fair: Too sandy
Roadfill	Poor: Low strength; area reclaim	Good

Included Areas & Remarks

Included in this map unit are small areas of the Midas family, 5 to 15 percent slopes, on lava flows. Included areas make up approximately 10 percent of the map unit area.

154 - Rock outcrop - Rubbleland complex

Elevation: Annual Precipitation:

Soil Map Unit Components	Rock outcrop	Rubbleland
Approx Proportion	—	—
Landscape Position	—	—
Slope	—	—
Typical Vegetation	—	—

Soil Profile Description

Surface Layer	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants	Rubbleland consists of areas of detached rock fragments (colluvium) which have accumulated on steep to very steep mountainsides as talus. These areas support little or no vegetation and are subject to landslides.
Subsoil	—	—
Substratum	—	—

Soil Properties

Restrictive Layer Depth	—	—
Effective Rooting Depth (inches)	—	—
Available Water Capacity	—	—
Water Retention Class	—	—
Hydrologic Soil Group	—	—
Permeability (in./hr.)	—	—
Drainage Class	—	—
Runoff	—	—
Max Erosion Hazard	—	—
Erosion Factor (k)		
Surface	—	—
Subsurface	—	—
T Value	—	—
Wind Erodability Group	—	—

154 - Rock outcrop - Rubbleland complex (continued)

Soil Manageability		
Group	—	—
Class	—	—

Range Interpretations

Productivity (lb/acre)	—	—
Suitability	—	—
Most Limiting Factors	—	—

Recreation Interpretations - Limitations for

Camp Areas	—	—
Picnic Areas	—	—
Paths & Trails	—	—

Engineering Interpretations

Unified Class		
Surface	—	—
Subsoil	—	—
Substratum	—	—
AASHTO Class		
Surface	—	—
Subsoil	—	—
Substratum	—	—
Suitability for		
Sand	—	—
Gravel	—	—
Topsoil	—	—
Roadfill	—	—

Included Areas & Remarks

Note: This unit is basically all misc. landtypes (rock outcrop and rubbleland), and this has few inclusions.

155 - Rock outcrop, limestone - Hymas family association, 60 to 80 percent slopes

Elevation: 5,280 to 8,800 feet Annual Precipitation: 10 inches

Soil Map Unit Components	Rock outcrop, limestone	Hymas family
Approx Proportion	40 percent	30 percent
Landscape Position	Mountainsides and ridgetops	Concave mountainsides
Slope	—	60 to 80 percent
Typical Vegetation	—	Singleleaf Pinyon Pine (Pinus monophylla); Juniper (Juniperus spp.)

Soil Profile Description

Surface Layer	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants	0 to 6 inches; brown gravelly sandy loam; weak fine granular structure; slightly to strongly effervescent; moderately alkaline
Subsoil	—	—
Substratum	—	6 to 19 inches; yellowish brown very gravelly sandy loam; moderate fine subangular blocky structure; violently effervescent; moderately alkaline 19 inches; hard fractured dolomite bedrock

Soil Properties

Restrictive Layer Depth	—	4 to 20 inches FB
Effective Rooting Depth (inches)	—	4 to 20 inches
Available Water Capacity	—	Very low (0.3 to 1.7 inches)
Water Retention Class	—	2 to 3 (0.3 to 1.7 inches)
Hydrologic Soil Group	—	D
Permeability (in./hr.)	—	2.0 to 6.0
Drainage Class	—	Well drained
Runoff	—	Very Rapid
Max Erosion Hazard	—	High
Erosion Factor (k)		
Surface	—	0.10 (low)
Subsurface	—	0.10 (low)
T Value	—	1
Wind Erodability Group	—	8

155 - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	—	4DEGPX

Range Interpretations

Productivity (lb/acre)	—	400 to 600
Suitability	—	Summer - Autumn
Most Limiting Factors	—	Plant competition; 30% shallow soils; 40% rock outcrop; high erosion hazard; very steep slopes

Recreation Interpretations - Limitations for

Camp Areas	—	Severe: Slope
Picnic Areas	—	Severe: Slope
Paths & Trails	—	Severe: Slope

Engineering Interpretations

Unified Class		
Surface	—	SM-SC
Subsoil	—	—
Substratum	—	SW-SM; SM-SC
AASHTO Class		
Surface	—	A-1-b; A-2-4
Subsoil	—	—
Substratum	—	A-1-a; A-1-b; A-2-4
Suitability for		
Sand	—	Poor: Excess fines; thin layer
Gravel	—	Unsuited
Topsoil	—	Poor: Slope; small stones; area reclaim
Roadfill	—	Poor: Slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of the Hymas family, 15 to 30 percent slopes, on ridgetops; the Bartine family, 80 to 90 percent slopes, on northerly-facing mountainsides, at higher elevations; and a soil similar to the Beveridge family, but moister, 15 to 60 percent slopes, in canyon bottoms. Included areas make up approximately 30 percent of the map unit area.

Rock outcrop is dolomite.

156 - Rock outcrop, granitic - Brad - Hartig families complex, 30 to 60 percent slopes

Elevation: 7,200 to 11,125 feet Annual Precipitation: 9 to 11 inches

Soil Map Unit Components	Rock outcrop, granitic	Brad family	Hartig family
Approx Proportion	35 percent	15 percent	15 percent
Landscape Position	Mountainsides and ridges	Mountainsides, between rock outcroppings	Mountainsides
Slope	—	30 to 60 percent	30 to 60 percent
Typical Vegetation	—	Mountain Mahogany (Cercocarpus ledifolius); Singleleaf Pinyon Pine (Pinus monophylla)	Big Sagebrush (Artemisia tridentata); Common Pricklygilia (leptodactylon pungens)
Soil Profile Description			
Surface Layer	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants	0 to 3 inches; dark grayish brown very gravelly sand; weak medium granular structure; neutral	0 to 11 inches; brown gravelly loam; moderate very fine & fine subangular blocky structure; mildly alkaline
Subsoil	—	—	—
Substratum	—	3 to 6 inches; dark grayish brown very gravelly loamy sand; massive; neutral 6 inches; hard adamellite bedrock	11 to 33 inches; brown extremely stony fine sandy loam; moderate very fine & fine subangular blocky structure; violently effervescent; mildly alkaline 33 inches; hard fractured granitic bedrock
Soil Properties			
Restrictive Layer Depth	—	4 to 8 inches HB	24 to 60 inches FB
Effective Rooting Depth (inches)	—	4 to 8 inches	20 to 40 inches
Available Water Capacity	—	Very low (0.1 to 0.3 inches)	Very low to moderate (1.5 to 4.8 inches)
Water Retention Class	—	3 (0.1 to 0.3 inches)	2 (1.5 to 2.0 inches)
Hydrologic Soil Group	—	D	B
Permeability (in./hr.)	—	6.0 to 20.0	0.6 to 2.0
Drainage Class	—	Excessive	Well drained
Runoff	—	Rapid to Very Rapid	Rapid to Very Rapid
Max Erosion Hazard	—	Very High	Moderate to High
Erosion Factor (k)			
Surface	—	0.02 (low)	0.24 (moderate)
Subsurface	—	0.05 (low)	0.17 (low)
T Value	—	1	3
Wind Erodability Group	—	8	8

156 - Rock outcrop (continued)

Soil Manageability Group	IV	IV	IV
Class	—	4DEPXg	3Xegp

Range Interpretations

Productivity (lb/acre)	—	600 to 1000	300 to 400
Suitability	—	Summer - Autumn	Summer - Autumn
Most Limiting Factors		Plant competition; 15% shallow soils; 35% rock outcrop; very high erosion hazard; steep slopes	Plant competition; 15% shallow soils; 35% rock outcrop; very high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	—	Severe: Slope; depth to rock; small stones	Severe: Slope
Picnic Areas	—	Severe: Slope; too sandy; large & small stones	Severe: Slope
Paths & Trails	—	Severe: Slope; large & small stones	Severe: Slope

Engineering Interpretations

Unified Class			
Surface	—	GW-GM	SM
Subsoil	—	—	—
Substratum	—	GW-GM	GM
AASHTO Class			
Surface	—	A-1-a; A-1-b; A-2-4	A-4
Subsoil	—	—	—
Substratum	—	A-1-a; A-1-b; A-2-4	A-1-a; A-1-b; A-2-4
Suitability for			
Sand	—	Unsuited	Unsuited
Gravel	—	Poor: Thin layer	Poor: Slope; thin layer; excess fines
Topsoil	—	Poor: Slope; area reclaim; thin layer; small stones	Poor: Slope; small stones
Roadfill	—	Poor: Slope; area reclaim	Poor: Slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of Brad family, 60 to 80 percent slopes, on mountainsides, between rock outcroppings; the Hartig family, 60 to 80 percent slopes, on mountainsides; the Sumine family, on mountainsides; the Supervisor family on mid to upper mountainsides and northerly and easterly-facing mountainsides; and a soil similar to the Wrango family, but cooler and less than 20 inches to soft bedrock, on mountainsides. Included areas make up approximately 35 percent of the map unit area.

157 - Rock outcrop, granitic - Brad - Hartig families complex, 60 to 80 percent slopes

Elevation: 5,600 to 10,250 feet Annual Precipitation: 9 to 11 inches

Soil Map Unit Components	Rock outcrop, granitic	Brad family	Hartig family
Approx Proportion	35 percent	20 percent	15 percent
Landscape Position	Mountainsides	Mountainsides, between rock outcroppings	Mountainsides
Slope	—	60 to 80 percent	60 to 80 percent
Typical Vegetation	—	Mountain Mahogany (Cercocarpus ledifolius); Singleleaf Pinyon Pine (Pinus monophylla)	Big Sagebrush (Artemisia tridentata); Common Pricklygilia (leptodactylon pungens)
Soil Profile Description			
Surface Layer	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants	0 to 3 inches; dark grayish brown very gravelly sand; weak medium granular structure; neutral	0 to 11 inches; brown gravelly loam; moderate very fine & fine subangular blocky structure; mildly alkaline
Subsoil	—	—	—
Substratum	—	3 to 6 inches; dark grayish brown very gravelly loamy sand; massive; neutral 6 inches; hard adamellite bedrock	11 to 33 inches; brown extremely stony fine sandy loam; moderate very fine & fine subangular blocky structure; violently effervescent; mildly alkaline 33 inches; hard fractured granitic bedrock
Soil Properties			
Restrictive Layer Depth	—	4 to 8 inches HB	24 to 60 inches FB
Effective Rooting Depth (inches)	—	4 to 8 inches	20 to 40 inches
Available Water Capacity	—	Very low (0.1 to 0.3 inches)	Very low to moderate (1.5 to 4.8 inches)
Water Retention Class	—	3 (0.1 to 0.3 inches)	2 (1.5 to 2.0 inches)
Hydrologic Soil Group	—	D	B
Permeability (in./hr.)	—	6.0 to 20.0	0.6 to 2.0
Drainage Class	—	Excessive	Well drained
Runoff	—	Very Rapid	Very Rapid
Max Erosion Hazard	—	Very High	High
Erosion Factor (k)			
Surface	—	0.02 (low)	0.24 (moderate)
Subsurface	—	0.05 (low)	0.17 (low)
T Value	—	1	3
Wind Erodability Group	—	8	8

Soil Manageability Group	IV	IV	IV
Class	—	4DEGPX	4EGXp

Range Interpretations

Productivity (lb/acre)	—	600 to 1000	300 to 400
Suitability	—	Summer - Autumn	Summer - Autumn
Most Limiting Factors	—	Plant competition; 20% shallow soils; 35% rock outcrop; very high erosion hazard; very steep slopes	Plant competition; 20% shallow soils; 35% rock outcrop; very high erosion hazard; very steep slopes

Recreation Interpretations - Limitations for

Camp Areas	—	Severe: Slope; depth to rock small stones	Severe: Slope
Picnic Areas	—	Severe: Slope; too sandy; large & small stones	Severe: Slope
Paths & Trails	—	Severe: Slope; large & small stones	Severe: Slope

Engineering Interpretations

Unified Class			
Surface	—	GW-GM	SM
Subsoil	—	—	—
Substratum	—	GW-GM	GM
AASHTO Class			
Surface	—	A-1-a; A-1-b; A-2-4	A-4
Subsoil	—	—	—
Substratum	—	A-1-a; A-1-b; A-2-4	A-1-a; A-1-b; A-2-4
Suitability for			
Sand	—	Unsuited	Unsuited
Gravel	—	Poor: Thin layer	Poor: Slope; thin layer; excess fines
Topsoil	—	Poor: Slope; area reclaim; thin layer; small stones	Poor: Slope; small stones
Roadfill	—	Poor: Slope; area reclaim	Poor: Slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of the Supervisor family, on mid to upper northerly and easterly-facing mountainsides, at higher elevations; the Sumine family, on mountainsides; and a soil similar to the Wrango family, but cooler and less than 20 inches to soft bedrock, 30 to 60 percent slopes, on mountainsides. Included areas make up approximately 30 percent of the map unit area.

158 - Rock outcrop, granitic - Packham family - Rubbleland association, 30 to 80 percent slopes

Elevation: 6,000 to 12,700 feet Annual Precipitation: 11 inches

Soil Map Unit Components	Rock outcrop, granitic	Packham family	Rubbleland, granitic
Approx Proportion	30 percent	25 percent	20 percent
Landscape Position	Mid to upper mountainsides	Lower mountainsides at higher elevations, and northerly and easterly-facing mountainsides at lower elevations	Mountainsides
Slope	—	30 to 80 percent	—
Typical Vegetation	—	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata); Wheatgrass (Agropyron spp.)	—
Soil Profile Description			
Surface Layer	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants	0 to 3 inches; pale brown extremely cobbly sandy loam; moderate very thick platy structure; neutral	Rubbleland consists of areas of detached rock fragments (colluvium) which have accumulated on steep to very steep mountainsides as talus. These areas support little or no vegetation and are subject to landslides.
Subsoil	—	3 to 15 inches; yellowish brown very & extremely gravelly sandy clay loam; massive; neutral	—
Substratum	—	15 to 60+ inches; light yellowish brown & very pale brown gravelly & extremely gravelly sandy loam; massive; none to violently effervescent; neutral to moderately alkaline	—
Soil Properties			
Restrictive Layer Depth	—	30 to 60 inches FB	—
Effective Rooting Depth (inches)	—	20 to 50 inches	—
Available Water Capacity	—	Very low to low (1.3 to 3.3 inches)	—
Water Retention Class	—	2 to 3 (1.0 to 1.2 inches)	—
Hydrologic Soil Group	—	B	—
Permeability (in./hr.)	—	0.2 to 0.6	—
Drainage Class	—	Well drained	—
Runoff	—	Rapid to Very Rapid	—
Max Erosion Hazard	—	Moderate to High	—
Erosion Factor (k)			
Surface	—	0.05 (low)	—
Subsurface	—	0.05 (low)	—
T Value	—	3	—
Wind Erodability Group	—	8	—

158 - Rock outcrop (continued)

Soil Manageability			
Group	IV	IV	IV
Class	—	4EGPX	—

Range Interpretations

Productivity (lb/acre)	—	500 to 700	—
Suitability	—	Summer - Autumn	—
Most Limiting Factors	—	Plant competition; 30% rock outcrop; 20% rubbleland; high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	—	Severe: Slope	—
Picnic Areas	—	Severe: Slope	—
Paths & Trails	—	Severe: Slope; large stones	—

Engineering Interpretations

Unified Class			
Surface	—	GM; GW-GM	—
Subsoil	—	GM; GW-GM	—
Substratum	—	GM; GW-GM	—
AASHTO Class			
Surface	—	A-1-a; A-1-b; A-2-4	—
Subsoil	—	A-2-6	—
Substratum	—	A-1-a; A-1-b; A-2-4	—
Suitability for			
Sand	—	Unsuited	—
Gravel	—	Poor: Excess fines	—
Topsoil	—	Poor: Slope; small stones	—
Roadfill	—	Poor: Slope	—

Included Areas & Remarks

Included in this map unit are small areas of the Slinger family, 30 to 60 percent slopes, on southerly and westerly-facing mountainsides, at lower elevations; a soil similar to the Soakpak family, but warmer, on upper mountainsides and ridges, at higher elevations. Included areas make up approximately 25 percent of the map unit area.

159 - Sanpete - Theriot families complex, 5 to 60 percent slopes

Elevation: 4,240 to 9,200 feet Annual Precipitation: 7 to 9 inches

Soil Map Unit Components	Sanpete family	Theriot family
Approx Proportion	35 percent	35 percent
Landscape Position	Mid to lower mountainsides	Ridges and upper to mid mountainsides
Slope	30 to 60 percent	15 to 30 percent
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monphylla); Juniper (Juniperus spp.); Black sagebrush (Artemisia arbuscula nova)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)

Soil Profile Description

Surface Layer	0 to 2 inches; pale brown gravelly fine sandy loam; weak fine granular structure; violently effervescent; moderately alkaline	0 to 6 inches; pale brown & light yellowish brown gravelly sandy loam & very cobbly sandy loam; weak fine granular structure; moderately alkaline
Subsoil	2 to 21 inches; light yellowish brown very cobbly fine sandy loam; weak fine subangular blocky structure; violently effervescent; moderately alkaline	—
Substratum	21 to 24 inches; white very cobbly fine sandy loam; massive; violently effervescent; moderately alkaline 24 inches; hard calcareous metasedimentary bedrock	6 inches; hard limestone bedrock

Soil Properties

Restrictive Layer Depth	21 to 40 inches HB	6 to 18 inches HB
Effective Rooting Depth (inches)	21 to 40 inches	6 to 18 inches
Available Water Capacity	Very low to low (1.5 to 3.4 inches)	Very low (0.4 to 1.4 inches)
Water Retention Class	2 (1.5 to 1.7 inches)	2 to 3 (0.4 to 1.4 inches)
Hydrologic Soil Group	C	D
Permeability (in./hr.)	2.0 to 6.0	2.0 to 6.0
Drainage Class	Well drained	Well drained
Runoff	Rapid to Very Rapid	Rapid
Max Erosion Hazard	Moderate to High	Moderate
Erosion Factor (k)		
Surface	0.15 (low)	0.10 (low)
Subsurface	0.15 (low)	0.05 (low)
T Value	2	1
Wind Erodability Group	8	8

159 - Sanpete - Theriot families complex (continued)

Soil Manageability		
Group	IV	IV
Class	2egpx	4DPex

Range Interpretations

Productivity (lb/acre)	300 to 500	300 to 500
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 10% rock outcrop; high erosion hazard; steep slopes	Plant competition; 10% rock outcrop; high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; depth to rock
Picnic Areas	Severe: Slope	Severe: Slope
Paths & Trails	Severe: Slope	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe: Slope

Engineering Interpretations

Unified Class		
Surface	SM	GW-GM; GM-GC
Subsoil	SM-SC	—
Substratum	GM; GW-GM	—
AASHTO Class		
Surface	A-4	A-1-a; A-1-b; A-2-4
Subsoil	A-2-4; A-4	—
Substratum	A-1-a; A-1-b; A-2-4	—
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Poor: Thin layer	Poor: Excess fines; thin layer
Topsoil	Poor: Slope; large & small stones	Poor: Slope; small stones; area reclaim
Roadfill	Poor: Slope; area reclaim	15 to 25% slopes: Poor - area reclaim 25 to 30% slopes: Poor - slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of the Trocken family, 5 to 15 percent slopes, in valley floors; the Theriot family, 30 to 60 percent slopes, on mid to lower mountainsides; a soil similar to the Gol family, but warmer and less than 20 inches to a hard calcium layer, 2 to 15 percent slopes, on alluvial fans; and limestone and dolomite rock outcropping, on ridges and mountainsides. Included areas make up approximately 30 percent of the map unit area.

160 - Sanpete - Theriot families - Rock outcrop, limestone association, 60 to 80 percent slopes

Elevation: 4,800 to 8,600 feet Annual Precipitation: 8 to 9 inches

Soil Map Unit Components	Sanpete family	Theriot family	Rock outcrop, limestone
Approx Proportion	35 percent	25 percent	20 percent
Landscape Position	Mid to lower mountainsides	Upper to mid mountainsides	Mountainsides
Slope	60 to 80 percent	60 to 80 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monphylla); Juniper (Juniperus spp.); Black sagebrush (Artemisia arbuscula nova)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	—

Soil Profile Description

Surface Layer	0 to 2 inches; pale brown gravelly fine sandy loam; weak fine granular structure; violently effervescent; moderately alkaline	0 to 6 inches; pale brown & light yellowish brown gravelly sandy loam & very cobbly sandy loam; weak fine granular structure; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	2 to 21 inches; light yellowish brown very cobbly fine sandy loam; weak fine subangular blocky structure; violently effervescent; moderately alkaline	—	—
Substratum	21 to 24 inches; white very cobbly fine sandy loam; massive; violently effervescent; moderately alkaline 24 inches; hard calcareous metasedimentary bedrock	6 inches; hard limestone bedrock	—

Soil Properties

Restrictive Layer Depth	21 to 40 inches HB	6 to 18 inches HB	—
Effective Rooting Depth (inches)	21 to 40 inches	6 to 18 inches	—
Available Water Capacity	Very low to low (1.5 to 3.4 inches)	Very low (0.4 to 1.4 inches)	—
Water Retention Class	2 (1.5 to 1.7 inches)	2 to 3 (0.4 to 1.4 inches)	—
Hydrologic Soil Group	C	D	—
Permeability (in./hr.)	2.0 to 6.0	2.0 to 6.0	—
Drainage Class	Well drained	Well drained	—
Runoff	Very Rapid	Very Rapid	—
Max Erosion Hazard	High	High	—
Erosion Factor (k)			
Surface	0.15 (low)	0.10 (low)	—
Subsurface	0.15 (low)	0.05 (low)	—
T Value	2	1	—
Wind Erodability Group	8	8	—

160 - Sanpete - Theriot families - Rock outcrop (continued)

Soil Manageability Group	IV	IV	IV
Class	4EGXp	4DEGPX	—

Range Interpretations

Productivity (lb/acre)	300 to 500	300 to 500	—
Suitability	Summer - Autumn	Summer - Autumn	
Most Limiting Factors	Plant competition; 20% rock outcrop; high erosion hazard; very steep slopes	Plant competition; 20% rock outcrop; high erosion hazard; very steep slopes	

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; depth to rock	—
Picnic Areas	Severe: Slope	Severe: Slope	—
Paths & Trails	Severe: Slope	Severe: Slope	—

Engineering Interpretations

Unified Class			
Surface	SM	GW-GM; GM-GC	—
Subsoil	SM-SC	—	—
Substratum	GM; GW-GM	—	—
AASHTO Class			
Surface	A-4	A-1-a; A-1-b; A-2-4	—
Subsoil	A-2-4; A-4	—	—
Substratum	A-1-a; A-1-b; A-2-4	—	—
Suitability for			
Sand	Unsuited	Unsuited	—
Gravel	Poor: Thin layer	Poor: Excess fines; thin layer	—
Topsoil	Poor: Slope; large & small stones	Poor: Slope; small stones; area reclaim	—
Roadfill	Poor: Slope; area reclaim	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Theriot family, 15 to 30 percent slopes, on ridgetops; and the Mulett family, on mid to lower mountainsides. Included areas make up approximately 20 percent of the map unit area.

Rock outcrop is limestone and dolomite.

161 - Simpson - Hartig - Bregar families association, 30 to 60 percent slopes

Elevation: 7,500 to 7,600 feet Annual Precipitation: 9 to 10 inches

Map Unit Components	Simpson family	Hartig family	Bregar family
Approx Proportion	40 percent	20 percent	20 percent
Landscape Position	Southerly and westerly-facing mountainsides	Northerly and easterly-facing mountainsides	Toeslopes and some lower northerly and easterly-facing mountainsides
Slope	30 to 60 percent	30 to 60 percent	30 to 60 percent
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	Big Sagebrush (Artemisia tridentata); Common Pricklygilia (Leptodactylon pungens)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata); Antelope bitterbrush (Purshia tridentata)
Soil Profile Description			
Surface Layer	0 to 8 inches; pale brown & brown gravelly loamy sand & sandy loam; weak fine & medium subangular blocky structure; neutral to mildly alkaline	0 to 11 inches; brown gravelly loam; moderate very fine & fine subangular blocky structure; mildly alkaline	0 to 2 inches; light brownish gray very cobbly loam; weak medium platy structure; mildly alkaline
Subsoil	8 to 23 inches; light yellowish brown & reddish yellow clay loam & cobbly clay loam; moderate fine prismatic & fine, medium & coarse subangular blocky structure; strongly effervescent; moderately alkaline	—	2 to 15 inches; light yellowish brown extremely cobbly & extremely gravelly loam; massive; neutral to mildly alkaline
Substratum	23 inches; andesite bedrock	11 to 33 inches; brown extremely stony fine sandy loam; moderate very fine & fine subangular blocky structure; violently effervescent; mildly alkaline 33 inches; hard fractured granitic bedrock	15 inches; hard fractured silty shale bedrock
Soil Properties			
Restrictive Layer Depth	20 to 40 inches HB	24 to 60 inches FB	15 to 20 inches FB
Eff. Rooting Depth	20 to 40 inches	20 to 40 inches	15 to 20 inches
Available Water Capacity	Low to moderate (2.3 to 5.8 inches)	Very low to moderate (1.5 to 4.8 inches)	Very low (0.6 to 1.1 inches)
Water Retention Class	1 to 2 (2.3 to 2.9 inches)	2 (1.5 to 2.0 inches)	3 (0.6 to 1.1 inches)
Hydrologic Soil Group	C	B	D
Permeability (in./hr.)	0.2 to 0.6	0.6 to 2.0	0.6 to 2.0
Drainage Class	Well drained	Well drained	Well drained
Runoff	Rapid to Very Rapid	Rapid to Very Rapid	Rapid to Very Rapid
Max Erosion Hazard	High	Moderate to High	High
Erosion Factor (k)			
Surface	0.05 (low)	0.24 (moderate)	0.10 (low)
Subsurface	0.15 (low)	0.17 (low)	0.05 (low)
T Value	2	3	1
Wind Erodability Group	8	8	8

161 - Simpson - Hartig - Bregar families association (continued)

Soil Manageability			
Group	III	III	III
Class	3Egx	2egpx	4EPdgx

Range Interpretations

Productivity (lb/acre)	400 to 600	300 to 400	300 to 500
Suitability	Summer - Autumn	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 5% rubbleland; high erosion hazard; steep slopes	Plant competition; 5% rubbleland; high erosion hazard; steep slopes	Plant competition; 5% rubbleland; high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope	Severe: Slope
Paths & Trails	Severe: Slope	Severe: Slope	Severe: Slope

Engineering Interpretations

Unified Class			
Surface	SM	SM	GC
Subsoil	ML	—	GC; GW-GM
Substratum	—	GM	—
AASHTO Class			
Surface	A-1-b; A-2-4	A-4	A-2-4
Subsoil	A-7-6	—	A-2-4
Substratum	—	A-1-a; A-1-b; A-2-4	—
Suitability for			
Sand	Unsuited	Unsuited	Unsuited
Gravel	Unsuited	Poor: Slope; thin layer; excess fines	Unsuited
Topsoil	Poor: Slope	Poor: Slope; small stones	Poor: Slope; area reclaim; small stones
Roadfill	Poor: Slope; area reclaim	Poor: Slope; area reclaim	Poor: Slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of Typic Haplargids, on northerly and easterly-facing mountainsides; the Washoe family, on southerly and westerly-facing mountainsides; and rubbleland, on mountainsides, but particularly associated with the Hartig family. Included areas make up approximately 20 percent of the map unit area.

162 - Spanel - Trocken families complex, 2 to 15 percent slopes

Elevation: 4,650 to 6,750 feet Annual Precipitation: 6 to 7 inches

Soil Map Unit Components	Spanel family	Trocken family
Approx Proportion	50 percent	20 percent
Landscape Position	Alluvial terraces & dissected alluvial fans	Recent drainages
Slope	2 to 15 percent	2 to 15 percent
Typical Vegetation	Shadscale (Artiplex confertifolia); Mormon Tea (Ephedra spp.)	Big Sagebrush (Artemisia tridentata); Greenfire (Menodora spp.)

Soil Profile Description

Surface Layer	0 to 3 inches; pale brown gravelly loam & loam; moderate very thin & thin platy & weak medium subangular blocky structure; slightly effervescent; moderately alkaline	0 to 9 inches; light brownish gray & pale brown very gravelly sandy loam; weak fine granular structure; moderately alkaline
Subsoil	3 to 19 inches; pale brown & light yellowish brown loam; moderate medium subangular blocky structure; slightly effervescent; moderately alkaline	—
Substratum	19 to 60 inches; indurated pan; light gray; violently effervescent; moderately alkaline	9 to 60 inches; light yellowish brown very gravelly sandy loam; massive; moderately alkaline

Soil Properties

Restrictive Layer Depth	8 to 19 inches DP	24 to 60+ inches HB
Effective Rooting Depth (inches)	8 to 19 inches	20 to 40 inches
Available Water Capacity	Very low to low (1.0 to 3.1 inches)	Very low to low (1.3 to 4.0 inches)
Water Retention Class	1 to 3 (1.0 to 3.1 inches)	2 to 3 (1.1 to 1.4 inches)
Hydrologic Soil Group	D	B
Permeability (in./hr.)	Less than 0.06	2.0 to 6.0
Drainage Class	Well drained	Well drained
Runoff	Slow to Medium	Slow to Medium
Max Erosion Hazard	High	High
Erosion Factor (k)		
Surface	0.24 (moderate)	0.10 (low)
Subsurface	0.43 (high)	0.05 (low)
T Value	1	3
Wind Erodability Group	4L	8

162 - Spanel - Trocken families complex (continued)

Soil Manageability		
Group	III	III
Class	3Edp	3Ep

Range Interpretations

Productivity (lb/acre)	100 to 300	300 to 400
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 50% shallow soils; high erosion hazard	Plant competition; 50% shallow soils; high erosion hazard

Recreation Interpretations - Limitations for

Camp Areas	Severe: percs slowly	2-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones
Picnic Areas	2-8% slopes: Slight 8-15% slopes: Moderate - slope	2-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones
Paths & Trails	Slight	Moderate: Small stones

Engineering Interpretations

Unified Class		
Surface	ML-CL	SM
Subsoil	CL	—
Substratum	—	GW-GM; GM-GC
AASHTO Class		
Surface	A-4	A-1-b; A-2-4
Subsoil	A-4	—
Substratum	—	A-1-a; A-1-b; A-2-4
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Unsuited	Poor: Excess fines
Topsoil	Poor: Slope; area reclaim	Poor: Small stones
Roadfill	Poor: Low strength	Good

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Spanel soil, but with a more fractured hardpan, on alluvial terraces and dissected alluvial fans; a soil similar to the Midas family, but less than 20 inches to a calcium-silica cemented layer, 15 to 30 percent slopes, on sideslopes and shoulders of older alluvial fans; the Bluewing family, in recent drainages; a soil similar to the Midas family, but less than 20 inches to hardpan, on alluvial terraces; and a soil similar to the Midas family, but with a more developed subsoil, on ridgetops and shoulders of ridges. Included areas make up approximately 30 percent of the map unit area.

163 - Spanel - Trocken families complex, 15 to 30 percent slopes

Elevation: 5,700 to 7,600 feet Annual Precipitation: 6 to 7 inches

Soil Map Unit Components	Spanel family	Trocken family
Approx Proportion	50 percent	20 percent
Landscape Position	Dissected older alluvial fans	Recent drainages
Slope	15 to 30 percent	15 to 30 percent
Typical Vegetation	Shadscale (Artiplex confertifolia); Mormon Tea (Ephedra spp.)	Big Sagebrush (Artemisia tridentata); Greenfire (Menodora spp.)

Soil Profile Description

Surface Layer	0 to 3 inches; pale brown gravelly loam & loam; moderate very thin & thin platy & weak medium subangular blocky structure; slightly effervescent; moderately alkaline	0 to 9 inches; light brownish gray & pale brown very gravelly sandy loam; weak fine granular structure; moderately alkaline
Subsoil	3 to 19 inches; pale brown & light yellowish brown loam; moderate medium subangular blocky structure; slightly effervescent; moderately alkaline	—
Substratum	19 to 60 inches; indurated pan; light gray; violently effervescent; moderately alkaline	9 to 60 inches; light yellowish brown very gravelly sandy loam; massive; moderately alkaline

Soil Properties

Restrictive Layer Depth	8 to 19 inches DP	24 to 60+ inches HB
Effective Rooting Depth (inches)	8 to 19 inches	20 to 40 inches
Available Water Capacity	Very low to low (1.0 to 3.1 inches)	Very low to low (1.3 to 4.0 inches)
Water Retention Class	1 to 3 (1.0 to 3.1 inches)	2 to 3 (1.1 to 1.4 inches)
Hydrologic Soil Group	D	B
Permeability (in./hr.)	Less than 0.06	2.0 to 6.0
Drainage Class	Well drained	Well drained
Runoff	Rapid	Rapid
Max Erosion Hazard	High	High
Erosion Factor (k)		
Surface	0.24 (moderate)	0.10 (low)
Subsurface	0.43 (high)	0.05 (low)
T Value	1	3
Wind Erodability Group	4L	8

163 - Spanel - Trocken families complex (continued)

Soil Manageability Group	III	III
Class	3Edp	3Ep

Range Interpretations

Productivity (lb/acre)	100 to 300	300 to 400
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 50% shallow soils; high erosion hazard	Plant competition; 50% shallow soils; high erosion hazard

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope; percs slowly	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope
Paths & Trails	15-25% slopes: Moderate - slope 25-30% slopes: Severe: Slope	15-25% slopes: Moderate slope; small stones 25-30% slopes: Severe: Slope

Engineering Interpretations

Unified Class		
Surface	ML-CL	SM
Subsoil	CL	—
Substratum	—	GW-GM; GM-GC
AASHTO Class		
Surface	A-4	A-1-b; A-2-4
Subsoil	A-4	—
Substratum	—	A-1-a; A-1-b; A-2-4
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Unsuited	Poor: Excess fines
Topsoil	Poor: Slope; area reclaim	Poor: Slope; small stones
Roadfill	15 to 25% slopes: Poor - low strength 25 to 30% slopes: Poor - slope; low strength	15 to 25% slopes: Fair - slope 25 to 30% slopes: Poor - slope

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Spanel family, but with a more fractured hardpan, on dissected older alluvial fans; a soil similar to the Midas family, but Less than 20 inches to a calcium-silica cemented layer, on sideslopes and shoulders of older alluvial fans; the Finley family, on colluvial sideslopes; a soil similar to the Midas family, but with a more developed subsoil, 2 to 15 percent slopes, on shoulders of ridges and ridgetops; and the Bluewing family, 2 to 15 percent slopes, in recent drainages. Included areas make up approximately 30 percent of the map unit area.

164 - Spanel - Trocken families complex, 30 to 60 percent slopes

Elevation: 4,160 to 6,600 feet Annual Precipitation: 6 to 7 inches

Soil Map Unit Components	Spanel family	Trocken family
Approx Proportion	45 percent	20 percent
Landscape Position	Dissected old alluvial fans	Recent drainages
Slope	30 to 60 percent	30 to 60 percent
Typical Vegetation	Shadscale (Artiplex confertifolia); Mormon Tea (Ephedra spp.)	Big Sagebrush (Artemisia tridentata); Greenfire (Mendora spp.)

Soil Profile Description

Surface Layer	0 to 3 inches; pale brown gravelly loam & loam; moderate very thin & thin platy & weak medium subangular blocky structure; slightly effervescent; moderately alkaline	0 to 9 inches; light brownish gray & pale brown very gravelly sandy loam; weak fine granular structure; moderately alkaline
Subsoil	3 to 19 inches; pale brown & light yellowish brown loam; moderate medium subangular blocky structure; slightly effervescent; moderately alkaline	—
Substratum	19 to 60 inches; indurated pan; light gray; violently effervescent; moderately alkaline	9 to 60 inches; light yellowish brown very gravelly sandy loam; massive; moderately alkaline

Soil Properties

Restrictive Layer Depth	8 to 19 inches DP	24 to 60 inches HB
Effective Rooting Depth (inches)	8 to 19 inches	20 to 40 inches
Available Water Capacity	Very low to low (1.0 to 3.1 inches)	Very low to low (1.3 to 4.0 inches)
Water Retention Class	1 to 3 (1.0 to 3.1 inches)	2 to 3 (1.1 to 1.4 inches)
Hydrologic Soil Group	D	B
Permeability (in./hr.)	Less than 0.06	2.0 to 6.0
Drainage Class	Well drained	Well drained
Runoff	Rapid to Very Rapid	Rapid to Very Rapid
Max Erosion Hazard	Very High	High to Very High
Erosion Factor (k)		
Surface	0.24 (moderate)	0.10 (low)
Subsurface	0.43 (high)	0.05 (low)
T Value	1	3
Wind Erodability Group	4L	8

164 - Spanel - Trocken families complex (continued)

Soil Manageability		
Group	III	III
Class	3Edgp	3Egp

Range Interpretations

Productivity (lb/acre)	100 to 300	300 to 400
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 45% shallow soils; very high erosion hazard; steep slopes	Plant competition; 45% shallow soils; very high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope; percs slowly	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope
Paths & Trails	Severe: Slope	Severe: Slope

Engineering Interpretations

Unified Class		
Surface	ML-CL	SM
Subsoil	CL	—
Substratum	—	GW-GM; GM-GC
AASHTO Class		
Surface	A-4	A-1-b; A-2-4
Subsoil	A-4	—
Substratum	—	A-1-a; A-1-b; A-2-4
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Unsuited	Poor: Excess fines
Topsoil	Poor: Slope; area reclaim	Poor: Slope; small stones
Roadfill	Poor: Slope; low strength	Poor: Slope

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Berent family, but drier, on mountainsides; a soil similar to the Spanel family, but with a more fractured hardpan, on dissected older alluvial fans; the Bluewing family, in recent drainages; the Finley family, 30 to 80 percent slopes, on colluvial sideslopes; a soil similar to the Midas family, but Less than 20 inches to a calcium-silica cemented layer, on sideslopes and shoulders of fans; and a soil similar to the Midas family, but with a more developed subsoil, 15 to 30 percent slopes, on shoulders of ridges and on ridgetops. Included areas make up approximately 35 percent of the map unit area.

165 - St. Marys - Bearskin families - Rock outcrop, volcanic association, 15 to 60 percent slopes

Elevation: 7,480 to 8,200 feet Annual Precipitation: 11 to 12 inches

Soil Map Unit Components	St. Marys family	Bearskin family	Rock outcrop, volcanic
Approx Proportion	40 percent	25 percent	15 percent
Landscape Position	Mountainsides	Ridgetops and shoulders of upper moutainsides.	Ridges and mountainsides
Slope	30 to 60 percent	15 to 30 percent	—
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Buckwheat (Eriogonum spp.)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata); Antelope Bitterbrush (Purshia tridentata)	—

Soil Profile Description

Surface Layer	0 to 9 inches; grayish brown & brown extremely stony loamy sand & loam; weak very fine, fine & medium subangular blocky structure; neutral	1 to 0 inches; Litter 0 to 2 inches; brown very cobbly sandy loam; weak very fine & fine subangular blocky structure; neutral	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	9 to 26 inches; brown & yellowish brown very gravelly clay loam & loam; massive; neutral	2 to 17 inches; brown cobbly sandy clay loam & sandy clay loam; moderate medium & coarse, & strong coarse subangular blocky structure; neutral	—
Substratum	26 to 60 inches; yellowish brown extremely gravelly loam & loam; massive; neutral	17 inches; hard basalt bedrock	—

Soil Properties

Restrictive Layer Depth	Greater than 60 inches	13 to 20 inches HB	—
Effective Rooting Depth (inches)	20 to 40 inches	13 to 20 inches	—
Available Water Capacity	Moderate (5.5 to 7.0 inches)	Very low to low (1.6 to 3.2 inches)	—
Water Retention Class	2 (1.2 to 1.6 inches)	1 to 2 (1.6 to 3.2 inches)	—
Hydrologic Soil Group	B	D	—
Permeability (in./hr.)	0.2 to 0.6	0.2 to 0.6	—
Drainage Class	Well drained	Well drained	—
Runoff	Rapid to Very Rapid	Rapid	—
Max Erosion Hazard	Moderate to High	Moderate to High	—
Erosion Factor (k) Surface Subsurface	 0.02 (low) 0.05 (low)	 0.02 (low) 0.10 (low)	—
T Value	2	1	—
Wind Erodability Group	8	8	—

165 - St. Marys - Bearskin families - Rock outcrop (continued)

Soil Manageability Group	IV	IV	IV
Class	4EXgp	3Xedp	—

Range Interpretations

Productivity (lb/acre)	600 to 1000	400 to 600	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; 25% shallow soils; 15% rock outcrop; high erosion hazard; steep slopes	Plant competition; 25% shallow soils; 15% rock outcrop; high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope; large & small stones	Severe: Slope	—
Picnic Areas	Severe: Slope; large & small stones	Severe: Slope	—
Paths & Trails	Severe: Slope; large & small stones	15-25% slopes: Severe - large stones 25-30% slopes: Severe - slope; large stones	—

Engineering Interpretations

Unified Class			
Surface	GW-GM	SC	—
Subsoil	GC	SM	—
Substratum	SM	—	—
AASHTO Class			
Surface	A-1-a; A-1-b; A-2-4	A-2-4	—
Subsoil	A-2-6	A-6	—
Substratum	A-4	—	—
Suitability for			
Sand	Poor: Excess fines	Poor: Excess fines	—
Gravel	Unsuited	Unsuited	—
Topsoil	Poor: Slope; small stones	Poor: Slope	—
Roadfill	Poor: Slope	15-25% slopes: Poor - are reclaim 25-30% slopes: Poor - slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Preston family, but colder, 15 to 30 percent slopes, in valleys and depressions; the Wenzel family, 30 to 60 percent slopes, on mid to upper mountainsides and rubbleland, on mountainsides. Included areas make up approximately 20 percent of the map unit area.

Rock outcrop is basalt.

166 - Supervisor - Bartine families association, 30 to 70 percent slopes

Elevation: 8,450 to 11,360 feet Annual Precipitation: 11 to 17 inches

Soil Map Unit Components	Supervisor family	Bartine family
Approx Proportion	50 percent	30 percent
Landscape Position	Lower to mid mountainsides	Mid to upper mountainsides
Slope	30 to 50 percent	50 to 70 percent
Typical Vegetation	Big Sagebrush (Artemesia tridentata); Lupine (Lupinus spp.)	Bristlecone Pine (Pinus aristata); Limber Pine (Pinus flexilis).

Soil Profile Description

Surface Layer	0 to 13 inches; grayish brown gravelly & very gravelly loam; weak very fine, fine & medium subangular blocky structure; neutral	0 to 11 inches; dark grayish brown & brown cobbly & very cobbly sandy loam; weak fine & medium subangular blocky structure; slightly effervescent; mildly alkaline
Subsoil	—	11 to 42 inches; pale brown very cobbly & extremely cobbly loam; weak fine & medium subangular blocky structure; slightly to violently effervescent; mildly to moderately alkaline
Substratum	13 to 60 inches; very pale brown extremely gravelly & extremely cobbly clay loam; massive; neutral	42 inches; hard, fractured dolomite bedrock

Soil Properties

Restrictive Layer Depth	30 to 60 inches FB	40 to 60 inches FB
Effective Rooting Depth (inches)	20 to 40 inches	40 to 60 inches
Available Water Capacity	Very low to low (1.5 to 3.5 inches)	Low to moderate (2.4 to 4.7 inches)
Water Retention Class	2 (1.5 to 1.9 inches)	2 (1.5 to 2.0 inches)
Hydrologic Soil Group	B	B
Permeability (in./hr.)	0.2 to 0.6	0.6 to 2.0
Drainage Class	Well drained	Well drained
Runoff	Rapid	Very Rapid
Max Erosion Hazard	High	High
Erosion Factor (k)		
Surface	0.17 (low)	0.15 (low)
Subsurface	0.15 (low)	0.10 (low)
T Value	4	3
Wind Erodability Group	8	8

166 - Supervisor - Bartine families association (continued)

Soil Manageability Group	III	III
Class	3Egpx	4EGpx

Range Interpretations

Productivity (lb/acre)	600 to 1000	350 to 650
Suitability	Summer	Summer
Most Limiting Factors	Plant competition; 10% rock outcrop; high erosion hazard; steep slopes.	Plant competition; 10% rock outcrop; high erosion hazard; steep slopes.

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope
Paths & Trails	Severe: Slope	Severe: Slope

Engineering Interpretations

Unified Class		
Surface	SC	SM
Subsoil	—	SM-SC
Substratum	GW; GM	—
AASHTO Class		
Surface	A-4	A-2-4
Subsoil	—	A-2-4; A-4
Substratum	A-2-6	—
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Fair: Excess fines	Unsuited
Topsoil	Poor: Slope; small stones	Poor: Slope; small stones
Roadfill	Poor: Slope	Poor: slope; large stones

Included Areas & Remarks

Included in map this map unit are small areas of the Swift Creek family, 30 to 50 percent slopes, mountainsides; and dolomite rock outcrop, on mountainsides and ridges. Included areas make up approximately 20 percent of the map unit area.

167 - Supervisor family - Rock outcrop, limestone - Bartine family association, 15 to 60 percent slopes

Elevation: 9,300 to 10,800 feet Annual Precipitation: 11 to 17 inches

Soil Map Unit Components	Supervisor family	Rock outcrop, limestone	Bartine family
Approx Proportion	35 percent	25 percent	20 percent
Landscape Position	Toeslopes and concave positions on moutainsides.	Mountainsides	Mountainsides
Slope	15 to 30 percent	—	30 to 60 percent
Typical Vegetation	Big Sagebrush (Artemesia tridentata); Lupine (Lupinus spp.)	—	Bristlecone Pine (Pinus aristata); Limber Pine (Pinus flexilis)

Soil Profile Description

Surface Layer	0 to 13 inches; grayish brown gravelly & very gravelly loam; weak very fine, fine & medium subangular blocky structure; neutral	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants	0 to 11 inches; dark grayish brown & brown cobbly & very cobbly sandy loam; weak fine & medium subangular blocky structure; slightly effervescent; mildly alkaline
Subsoil	—	—	11 to 42 inches; pale brown very cobbly & extremely cobbly loam; weak fine & medium subangular blocky structure; slightly to violently effervescent; mildly to moderately alkaline
Substratum	13 to 60 inches; very pale brown extremely gravelly & extremely cobbly clay loam; massive; neutral	—	42 inches; hard fractured dolomite bedrock

Soil Properties

Restrictive Layer Depth	30 to 60 inches FB	—	40 to 60 inches FB
Effective Rooting Depth (inches)	20 to 40 inches	—	40 to 60 inches
Available Water Capacity	Very low to low (1.5 to 3.5 inches)	—	Low to moderate (2.4 to 4.7 inches)
Water Retention Class	2 (1.5 to 1.9 inches)	—	2 (1.5 to 2.0 inches)
Hydrologic Soil Group	B	—	B
Permeability (in./hr.)	0.2 to 0.6	—	0.6 to 2.0
Drainage Class	Well drained	—	Well drained
Runoff	Rapid	—	Rapid to Very Rapid
Max Erosion Hazard	Moderate to High	—	Moderate to High
Erosion Factor (k)			
Surface	0.17 (low)	—	0.15 (low)
Subsurface	0.15 (low)		0.10 (low)
T Value	4	—	3
Wind Erodability Group	8	—	8

167 - Supervisor family - Rock outcrop (continued)

Soil Manageability Group	III	III	III
Class	3Xep	—	4EXgp

Range Interpretations

Productivity (lb/acre)	600 to 1000	—	350 to 650
Suitability	Summer	—	Summer
Most Limiting Factors	Plant competition; 25% rock outcrop; high erosion hazard; steep slopes	—	Plant competition; 25% rock outcrop; high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—	Severe: Slope
Picnic Areas	Severe: Slope	—	Severe: Slope
Paths & Trails	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - Slope	—	Severe: Slope

Engineering Interpretations

Unified Class			
Surface	SC	—	SM
Subsoil	—	—	SM-SC
Substratum	GW; GM	—	—
AASHTO Class			
Surface	A-4	—	A-2-4
Subsoil	—	—	A-2-4; A-4
Substratum	A-2-6	—	—
Suitability for			
Sand	Unsuited	—	Unsuited
Gravel	Fair: Excess fines	—	Unsuited
Topsoil	Poor: Slope; small stones	—	Poor: Slope; small stones
Roadfill	15-25% slopes: Fair - slope 25-30% slopes: Poor - slope	—	Poor: Slope; large stones

Included Areas & Remarks

Included in this map unit are small areas of the Hartig family, 30 to 60 percent slopes, on southerly and westerly-facing mountainsides; and the Packham family, 30 to 60 percent slopes, on mountainsides. Included areas make up approximately 20 percent of the map unit area.

Rock outcrop is dolomite.

168 - Supervisor family - Rock outcrop, granitic - Pergelic Cryoborolls association, 60 to 80 percent slopes

Elevation: 8,800 to 12,565 feet Annual Precipitation: 15 to 17 inches

Soil Map Unit Components	Supervisor family	Rock outcrop, granitic	Pergelic Cryoborolls
Approx Proportion	30 percent	25 percent	20 percent
Landscape Position	Southerly and westerly-facing mountainsides	Mountainsides and ridges	Northerly and easterly-facing mountainsides
Slope	60 to 80 percent	—	60 to 80 percent
Typical Vegetation	Big Sagebrush (Artemesia tridentata); Lupine (Lupinus spp.)	—	Goldenbush (Haplopappus spp.); Buckwheat (Eriogonum spp.); Bluegrass (Poa spp.)

Soil Profile Description

Surface Layer	0 to 13 inches; grayish brown gravelly & very gravelly loam; weak very fine, fine & medium subangular blocky structure; neutral	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants	1 to 0 inch; Root mat 0 to 2 inches; dark grayish brown very stony loam; moderate medium & coarse subangular blocky structure; neutral
Subsoil	—	—	2 to 14 inches; brown & yellowish brown very stony loam; moderate fine, medium & coarse subangular blocky structure; neutral to slightly acid
Substratum	13 to 60 inches; very pale brown extremely gravelly & extremely cobbly clay loam; massive; neutral	—	14 to 39 inches; pale brown very stony & extremely stony loam; moderate fine & medium subangular blocky structure; slightly to strongly acid 39 inches; hard fractured granodiorite bedrock

Soil Properties

Restrictive Layer Depth	30 to 60 inches FB	—	35 to 60+ inches FB
Effective Rooting Depth (inches)	20 to 40 inches	—	20 to 40 inches
Available Water Capacity	Very low to low (1.5 to 3.5 inches)	—	Low (2.0 to 3.5 inches)
Water Retention Class	2 (1.5 to 1.9 inches)	—	2 (1.4 to 1.8 inches)
Hydrologic Soil Group	B	—	B
Permeability (in./hr.)	0.2 to 0.6	—	0.6 to 2.0
Drainage Class	Well drained	—	Well drained
Runoff	Very Rapid	—	Very Rapid
Max Erosion Hazard	High	—	High
Erosion Factor (k)			
Surface	0.17 (low)	—	0.17 (low)
Subsurface	0.15 (low)	—	0.10 (low)
T Value	4	—	4
Wind Erodability Group	8	—	8

168 - Supervisor family - Rock outcrop (continued)

Soil Manageability Group	IV	IV	IV
Class	4EGXp	—	4EGXp

Range Interpretations

Productivity (lb/acre)	600 to 1000	—	75 to 100
Suitability	Summer	—	Summer
Most Limiting Factors	Plant competition; 25% rock outcrop; high erosion hazard; very steep slopes	—	Plant competition; 25% rock outcrop; high erosion hazard; very steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—	Severe: Slope
Picnic Areas	Severe: Slope	—	Severe: slope
Paths & Trails	Severe: Slope; large stones	—	Severe: Slope; large stones

Engineering Interpretations

Unified Class			
Surface	SC	—	SM
Subsoil	—	—	SC
Substratum	GW-GM	—	SM-SC
AASHTO Class			
Surface	A-4	—	A-4
Subsoil	—	—	A-2-4
Substratum	A-2-6	—	A-4
Suitability for			
Sand	Unsuited	—	Unsuited
Gravel	Fair: Excess fines	—	Unsuited
Topsoil	Poor: Slope; small stones	—	Poor: Slope; large & small stones
Roadfill	Poor: Slope	—	Poor: Slope; large stones; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of the Soakpak family, 30 to 60 percent slopes, on benches of mountainsides; and granitic rubbleland, on mountainsides. Included areas make up approximately 25 percent of the map unit area.

169 - Supervisor family - Rock outcrop, metasedimentary complex, 5 to 30 percent slopes

Elevation: 9,900 to 11,050 feet Annual Precipitation: 17 inches

Soil Map Unit Components	Supervisor family	Rock outcrop, metasedimentary
Approx Proportion	65 percent	15 percent
Landscape Position	Mountainsides	Ridges and upper mountainsides
Slope	5 to 30 percent	—
Typical Vegetation	Big Sagebrush (Artemesia tridentata); Lupine (Lupinus spp.)	—

Soil Profile Description

Surface Layer	0 to 13 inches; grayish brown gravelly & very gravelly loam; weak very fine, fine & medium subangular blocky structure; neutral	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	13 to 60 inches; very pale brown extremely gravelly & extremely cobbly clay loam; massive; neutral	—

Soil Properties

Restrictive Layer Depth	30 to 60 inches FB	—
Effective Rooting Depth (inches)	20 to 40 inches	—
Available Water Capacity	Very low to low (1.5 to 3.5 inches)	—
Water Retention Class	2 (1.5 to 1.9 inches)	—
Hydrologic Soil Group	B	—
Permeability (in./hr.)	0.20 to 0.60	—
Drainage Class	Well drained	—
Runoff	Medium to Rapid	—
Max Erosion Hazard	Moderate to High	—
Erosion Factor (k)		
Surface	0.17 (low)	—
Subsurface	0.15 (low)	—
T Value	4	—
Wind Erodability Group	8	—

169 - Supervisor family - Rock outcrop (continued)

Soil Manageability		
Group	III	III
Class	3Xep	—

Range Interpretations

Productivity (lb/acre)	600 to 1000	—
Suitability	Summer	—
Most Limiting Factors	Plant competition; 15% rock outcrop; high erosion hazard	—

Recreation Interpretations - Limitations for

Camp Areas	5-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones 15-30% slopes: Severe - slope	—
Picnic Areas	5-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones 15-30% slopes: Severe - slope	—
Paths & Trails	5-15% slopes: Moderate - small stones 15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - slope	—

Engineering Interpretations

Unified Class		
Surface	SC	—
Subsoil	—	—
Substratum	GW; GM	—
AASHTO Class		
Surface	A-4	—
Subsoil	—	—
Substratum	A-2-6	—
Suitability for		
Sand	Unsuited	—
Gravel	Fair: Excess fines	—
Topsoil	5-15% slopes: Poor - small stones 15-30% slopes: Poor - slope; small stones	—
Roadfill	5-15% slopes: Good 15-25% slopes: Fair - slope 25-30% slopes: Poor - slope	—

Included Areas & Remarks

Included in this map unit are small areas of the Bartine family, on mountainsides; the Packham family, on smooth-shaped mountainsides; and metasedimentary rubbleland, on mountainsides. Included areas make up approximately 20 percent of the map unit area.

170 - Supervisor family - Rock outcrop, metasedimentary complex, 30 to 60 percent slopes

Elevation: 8,800 to 11,550 feet Annual Precipitation: 17 inches

Soil Map Unit Components	Supervisor family	Rock outcrop, metasedimentary
Approx Proportion	65 percent	15 percent
Landscape Position	Mountainsides	Mountainsides & ridges
Slope	30 to 60 percent	—
Typical Vegetation	Big Sagebrush (Artemesia tridentata); Lupine (Lupinus spp)	—

Soil Profile Description

Surface Layer	0 to 13 inches; grayish brown gravelly & very gravelly loam; weak very fine, fine & medium subangular blocky structure; neutral	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	13 to 60 inches; very pale brown extremely gravelly & extremely cobbly clay loam; massive; neutral	—

Soil Properties

Restrictive Layer Depth	30 to 60 inches FB	—
Effective Rooting Depth (inches)	20 to 40 inches	—
Available Water Capacity	Very low to low (1.5 to 3.5 inches)	—
Water Retention Class	2 (1.5 to 1.9 inches)	—
Hydrologic Soil Group	B	—
Permeability (in./hr.)	0.2 to 0.6	—
Drainage Class	Well drained	—
Runoff	Rapid to Very Rapid	—
Max Erosion Hazard	High	—
Erosion Factor (k)		
Surface	0.17 (low)	—
Subsurface	0.15 (low)	—
T Value	4	—
Wind Erodability Group	8	—

170 - Supervisor family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4EXgp	—

Range Interpretations

Productivity (lb/acre)	600 to 1000	—
Suitability	Summer	—
Most Limiting Factors	Plant competition; 15% rock outcrop; high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	SC	—
Subsoil	—	—
Substratum	GW-GM	—
AASHTO Class		
Surface	A-4	—
Subsoil	—	—
Substratum	A-2-6	—
Suitability for		
Sand	Unsuited	—
Gravel	Fair: Excess fines	—
Topsoil	Poor: Slope; Small stones	
Roadfill	Poor: Slope	—

Included Areas & Remarks

Included in this map unit are small areas of the Bartine family, on mountainsides; the Packham family, on smooth-shaped mountainsides; and metasedimentary rubbleland, on mountainsides. Included areas make up approximately 20 percent of the map unit area.

171 - Swift Creek family - Rock outcrop, limestone complex, 15 to 30 percent slopes

Elevation: 10,000 to 11,710 feet Annual Precipitation: 11 inches

Soil Map Unit Components	Swift Creek family	Rock outcrop, limestone
Approx Proportion	70 percent	15 percent
Landscape Position	Mountainsides	Ridges and upper mountainsides
Slope	15 to 30 percent	—
Typical Vegetation	Buckwheat (Erigonum spp.); Bluegrass (Poa spp.)	—

Soil Profile Description

Surface Layer	0 to 7 inches; brown & pale brown very cobbly sandy loam; weak very fine & fine subangular blocky structure; strongly to violently effervescent; mildly to moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	7 to 35 inches; light yellowish brown & very pale brown very cobbly & extremely cobbly sandy loam; weak very fine subangular blocky structure and massive; violently effervescent; moderately alkaline 35 inches; fractured dolomite bedrock	—

Soil Properties

Restrictive Layer Depth	21 to 40 inches FB	—
Effective Rooting Depth (inches)	21 to 40 inches	—
Available Water Capacity	Very low (0.8 to 1.8 inches)	—
Water Retention Class	3 (0.8 to 1.1 inches)	—
Hydrologic Soil Group	B	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Rapid	—
Max Erosion Hazard	Moderate	—
Erosion Factor (k)		
Surface	0.15 (low)	—
Subsurface	0.10 (low)	—
T Value	2	—
Wind Erodability Group	8	—

171 - Swift Creek family - Rock outcrop (continued)

Soil Manageability		
Group	III	III
Class	3Pex	—

Range Interpretations

Productivity (lb/acre)	200 to 300	—
Suitability	Summer	—
Most Limiting Factors	15% rock outcrop	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	15-25% slopes: Moderate - large & small stones 25-30% slopes: Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	SM	—
Subsoil	—	—
Substratum	GM; GW-GM	—
AASHTO Class		
Surface	A-1-b; A-2-4	—
Subsoil	—	—
Substratum	A-1-a; A-1-b; A-2-4	—
Suitability for		
Sand	Unsuited	—
Gravel	Poor: Excess fines; thin layer	—
Topsoil	Poor: Slope; Small stones	—
Roadfill	15-25% slopes: Poor - area reclaim 25-30% slopes: Poor - slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Swift Creek family, 30 to 60 percent slopes, on mountainsides; and the Supervisor family, on mountainsides. Included areas make up approximately 15 percent of the map unit area.

Rock outcrop is dolomite.

172 - Theriot family - Rock outcrop, limestone association, 15 to 30 percent slopes

Elevation: 4,450 to 6,400 feet Annual Precipitation: 6 inches

Soil Map Unit Components	Theriot family	Rock outcrop, limestone
Approx Proportion	60 percent	20 percent
Landscape Position	Mid to lower mountainsides	Upper mountainsides and ridges
Slope	15 to 30 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemesia tridentata)	—

Soil Profile Description

Surface Layer	0 to 6 inches; pale brown & light yellowish brown gravelly sandy loam and very cobbly sandy loam; weak fine granular structure; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	6 inches; hard limestone bedrock	—

Soil Properties

Restrictive Layer Depth	6 to 18 inches HB	—
Effective Rooting Depth (inches)	6 to 18 inches	—
Available Water Capacity	Very low (0.4 to 1.4 inches)	—
Water Retention Class	2 to 3 (0.4 to 1.4 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Rapid	—
Max Erosion Hazard	Moderate	—
Erosion Factor (k)		
Surface	0.10 (low)	—
Subsurface	0.05 (low)	—
T Value	1	—
Wind Erodability Group	8	—

172 - Theriot family - Rock outcrop (continued)

Soil Manageability Group	IV	IV
Class	4DPXe	—

Range Interpretations

Productivity (lb/acre)	300 to 500	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 60% shallow soils; 20% rock outcrop	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope; depth to rock	—
Picnic Areas	Severe: Slope	—
Paths & Trails	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - Slope	—

Engineering Interpretations

Unified Class		
Surface	GW-GM; GM-GC	—
Subsoil	—	—
Substratum	—	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	—	—
Substratum	—	—
Suitability for		
Sand	Unsuited	—
Gravel	Poor: Excess fines; thin layer	—
Topsoil	Poor: Slope; area reclaim; Small stones	—
Roadfill	15-25% slopes: Poor - Area reclaim 25-30% slopes: Poor - slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Blackston family, 9 to 15 percent slopes, on colluvial toeslopes; and a soil similar to the Theriot family, but greater than 20 inches to bedrock, on toeslopes and lower mountainsides. Included areas make up approximately 20 percent of the map unit area.

173 - Theriot family - Rock outcrop, limestone association, 30 to 60 percent slopes

Elevation: 4,160 to 7,400 feet Annual Precipitation: 6 inches

Soil Map Unit Components	Theriot family	Rock outcrop, limestone
Approx Proportion	50 percent	30 percent
Landscape Position	Mid to lower mountainsides	Upper mountainsides and ridges
Slope	30 to 60 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemesia tridentata)	—

Soil Profile Description

Surface Layer	0 to 6 inches; pale brown & light yellowish brown gravelly sandy loam & very cobbly sandy loam; weak fine granular structure; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	6 inches; hard limestone bedrock	—

Soil Properties

Restrictive Layer Depth	6 to 18 inches HB	—
Effective Rooting Depth (inches)	6 to 18 inches	—
Available Water Capacity	Very low (0.4 to 1.4 inches)	—
Water Retention Class	2 to 3 (0.4 to 1.4 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Rapid to Very Rapid	—
Max Erosion Hazard	Moderate to High	—
Erosion Factor (k)		
Surface	0.10 (low)	—
Subsurface	0.05 (low)	—
T Value	1	—
Wind Erodability Group	8	—

173 - Theriot family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4DEPXg	—

Range Interpretations

Productivity (lb/acre)	300 to 500	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 50% shallow soils; 30% rock outcrop; high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope; depth to rock	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	GW-GM; GM-GC	—
Subsoil	—	—
Substratum	—	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	—	—
Substratum	—	—
Suitability for		
Sand	Unsuited	—
Gravel	Poor: Excess fines; thin layer	—
Topsoil	Poor: Slope; area reclaim; Small stones	—
Roadfill	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Blackston family, 15 to 30 percent slopes, on colluvial toeslopes; and a soil similar to the Theriot family, but greater than 20 inches to bedrock, 15 to 60 percent slopes, on toeslopes and lower mountainsides. Included areas make up approximately 20 percent of the map unit area.

174 - Theriot family - Rock outcrop, limestone association, 60 to 80 percent slopes

Elevation: 4,150 to 7,700 feet Annual Precipitation: 6 inches

Soil Map Unit Components	Theriot family	Rock outcrop, limestone
Approx Proportion	45 percent	35 percent
Landscape Position	Mid to lower mountainsides	Upper mountainsides and ridges
Slope	60 to 80 percent	—
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemesia tridentata)	—

Soil Profile Description

Surface Layer	0 to 6 inches; pale brown & light yellowish brown gravelly sandy loam and very cobbly sandy loam; weak fine granular structure; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	6 inches; hard limestone bedrock	—

Soil Properties

Restrictive Layer Depth	6 to 18 inches HB	—
Effective Rooting Depth (inches)	6 to 18 inches	—
Available Water Capacity	Very low (0.4 to 1.4 inches)	—
Water Retention Class	2 to 3 (0.4 to 1.4 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Very Rapid	—
Max Erosion Hazard	High	—
Erosion Factor (k)		
Surface	0.10 (low)	—
Subsurface	0.05 (low)	—
T Value	1	—
Wind Erodability Group	8	—

174 - Theriot family - Rock outcrop (continued)

Soil Manageability Group	IV	IV
Class	4DEGPX	—

Range Interpretations

Productivity (lb/acre)	300 to 500	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 45% shallow soils; 35% rock outcrop; high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope; depth to rock	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	GW-GM; GM-GC	—
Subsoil	—	—
Substratum	—	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	—	—
Substratum	—	—
Suitability for		
Sand	Unsuited	—
Gravel	Poor: Excess fines; thin layer	—
Topsoil	Poor: Slope; area reclaim; Small stones	—
Roadfill	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Blackston family, 30 to 60 percent slopes, on colluvial toeslopes; and a soil similar to the Theriot family, but greater than 20 inches to bedrock, 30 to 80 percent slopes, on toeslopes and lower mountainsides. Included areas make up approximately 20 percent of the map unit area.

175 - Toeja - Berning - Simpson families association, 15 to 60 percent slopes

Elevation: 6,800 to 9,240 feet Annual Precipitation: 10 to 11 inches

Soil Map Unit Components	Toeja family	Berning family	Simpson family
Approx Proportion	35 percent	20 percent	15 percent
Landscape Position	Northerly and easterly-facing mountainsides	Southerly and westerly-facing mountainsides	Benches of southerly and westerly-facing mountainsides
Slope	30 to 60 percent	30 to 60 percent	15 to 30 percent
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Curlleaf Mountain Mahogany (Cercocarpus ledifolius); Big Sagebrush (Artemesia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemesia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemesia tridentata)

Soil Profile Description

Surface Layer	1 to 0 inches: Litter 0 to 12 inches; light brownish gray & grayish brown very cobbly sandy loam & gravelly loam; weak very coarse platy & weak medium subangular blocky structure; moderately alkaline	0 to 4 inches; light brownish gray extremely stony loamy sand; weak fine & medium subangular blocky structure; neutral	0 to 8 inches; pale brown & brown gravelly loamy sand & sandy loam; weak fine & medium subangular blocky structure; neutral to mildly alkaline
Subsoil	12 to 22 inches; yellowish brown gravelly sandy clay loam; strong fine & medium subangular blocky structure; moderately alkaline	4 to 24 inches; pale brown & reddish yellow very stony loam & very cobbly clay; weak fine & medium subangular blocky structure & massive; neutral to mildly alkaline	8 to 23 inches; light yellowish brown & reddish yellow clay loam & cobbly clay loam; moderate fine prismatic & moderate fine, medium & coarse subangular blocky structure; strongly effervescent; moderately alkaline
Substratum	22 inches; Weathered rhyolite (paralithic contact)	24 inches; hard, highly fractured rhyolite bedrock	23 inches; andesite bedrock

Soil Properties

Restrictive Layer Depth	21 to 24 inches PARA	20 to 40 inches FB	20 to 40 inches HB
Effective Rooting Depth (inches)	21 to 24 inches	20 to 40 inches	20 to 40 inches
Available Water Capacity	Low (2.4 to 3.4 inches)	Very low to low (1.2 to 2.7 inches)	Low to moderate (2.3 to 5.8 inches)
Water Retention Class	1 to 2 (2.1 to 2.7 inches)	2 to 3 (1.1 to 1.3 inches)	1 to 2 (2.3 to 2.9 inches)
Hydrologic Soil Group	C	B	C
Permeability (in./hr.)	0.2 to 0.6	0.06 to 0.20	0.2 to 0.6
Drainage Class	Well drained	Well drained	Well drained
Runoff	Rapid to Very Rapid	Rapid to Very Rapid	Rapid
Max Erosion Hazard	High to Very High	Very High	Moderate
Erosion Factor (k) Surface Subsurface	 0.10 (low) 0.28 (moderate)	 0.02 (low) 0.05 (low)	 0.05 (low) 0.15 (low)
T Value	2	2	2
Wind Erodability Group	8	8	8

175 - Toeja - Berning - Simpson families association (continued)

Soil Manageability Group	III	III	III
Class	3Egx	3Egpx	2ex

Range Interpretations

Productivity (lb/acre)	600 to 1000	300 to 500	400 to 600
Suitability	Summer - Autumn	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 5% rock outcrop; very high erosion hazard; steep slopes	Plant competition; 5% rock outcrop; very high erosion hazard; steep slopes	Plant competition; 5% rock outcrop; very high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; small stones	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope; small slopes	Severe: Slope
Paths & Trails	Severe: Slope	Severe: Slope; small stones	15-25% slopes: Moderate - Slope; too sandy; small stones 25-30% slopes: Severe - Slope

Engineering Interpretations

Unified Class			
Surface	SM	GP	SM
Subsoil	SM	SM	ML
Substratum	—	—	—
AASHTO Class			
Surface	A-4	A-1-a; A-1-b; A-2-4	A-1-b; A-2-4
Subsoil	A-2-7	A-2-6	A-7-6
Substratum	—	—	—
Suitability for			
Sand	Poor: Excess fines	Poor: Excess fines	Unsuited
Gravel	Unsuited	Unsuited	Unsuited
Topsoil	Poor: Slope; small stones	Poor: Slope; large and small stones	Poor: Slope
Roadfill	Poor: Slope; area reclaim	Poor: Slope; area reclaim	15-25% slopes: Poor - area reclaim 25-30% slopes: Poor - slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of the Toeja family, 15 to 30 percent slopes, on northerly and easterly-facing mountainsides; the Sumine family, 30 to 60 percent slopes, on northerly and easterly-facing mountainsides; a soil similar to the Moano family, but moister, 50 to 75 percent slopes, on eroded southerly and westerly-facing mountainsides; and rhyolite rock outcrop, on ridges and mountainsides. Included areas make up approximately 30 percent of the map unit area.

176 - Toeja - Merlin families complex, 30 to 60 percent slopes

Elevation: 6,760 to 7,620 feet Annual Precipitation: 11 inches

Soil Map Unit Components	Toeja family	Merlin family
Approx Proportion	50 percent	30 percent
Landscape Position	Mountainsides	Mountainsides
Slope	30 to 60 percent	30 to 60 percent
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Curlleaf Mountain Mahogany (Cerocarpus ledifolius); Big Sagebrush (Artemesia tridentata)	Low Sagebrush (Artemesia arbuscula); Squirreltail (Sitanion spp.)

Soil Profile Description

Surface Layer	1 to 0 inch; Litter 0 to 12 inches; light brownish gray & grayish brown very cobbly sandy loam & gravelly loam; weak very coarse platy & weak medium subangular blocky structure; moderately alkaline	0 to 4 inches; brown gravelly & very gravelly sandy loam; weak fine granular & subangular blocky structure; slightly to medium acid
Subsoil	12 to 22 inches; yellowish brown gravelly sandy clay loam; strong fine & medium subangular blocky structure; moderately alkaline	4 to 15 inches; brown gravelly clay loam; moderate fine & medium subangular blocky structure; neutral
Substratum	22 inches; weathered rhyolite bedrock (paralithic contact)	15 inches; basalt bedrock

Soil Properties

Restrictive Layer Depth	21 to 24 inches PARA	10 to 20 inches HB
Effective Rooting Depth (inches)	21 to 24 inches	10 to 20 inches
Available Water Capacity	Low (2.4 to 3.4 inches)	Very low to low (1.3 to 3.2 inches)
Water Retention Class	1 to 2 (2.1 to 2.7 inches)	1 to 2 (1.3 to 3.2 inches)
Hydrologic Soil Group	C	D
Permeability (in./hr.)	0.2 to 0.6	0.2 to 0.6
Drainage Class	Well drained	Well drained
Runoff	Rapid to Very Rapid	Rapid to Very Rapid
Max Erosion Hazard	High to Very High	High
Erosion Factor (k) Surface Subsurface	 0.10 (low) 0.28 (moderate)	 0.02 (low) 0.24 (moderate)
T Value	2	1
Wind Erodability Group	8	8

176 - Toeja - Merlin families complex (continued)

Soil Manageability		
Group	III	III
Class	3Eg	3Edgp

Range Interpretations

Productivity (lb/acre)	600 to 1000	200 to 250
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; very high erosion hazard; steep slopes	Plant competition; very high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope
Paths & Trails	Severe: Slope	Severe: Slope

Engineering Interpretations

Unified Class		
Surface	SM	SM-SC
Subsoil	SM	ML
Substratum	—	—
AASHTO Class		
Surface	A-4	A-2-4; A-4
Subsoil	A-2-7	A-7-6
Substratum	—	—
Suitability for		
Sand	Poor: Excess fines	Unsuited
Gravel	Unsuited	Unsuited
Topsoil	Poor: Slope; small stones	Poor: Slope; area reclaim; Small stones
Roadfill	Poor: Slope; area reclaim	Poor: Slope; area reclaim; low strength

Included Areas & Remarks

Included in this map unit are small areas of the Spaa family, on mountainsides; and a soil similar to the Berent family, but colder on 15 to 30 percent slopes, in depressions, superimposed on the Toeja and Merlin family components. Included areas make up approximately 20 percent of the map unit area.

177 - Toeja - Merlin families - Rock outcrop, volcanic complex, 5 to 40 percent slopes

Elevation: 6,680 to 8,050 feet Annual Precipitation: 11 inches

Soil Map Unit Components	Toeja family	Merlin family	Rock outcrop, volcanic
Approx Proportion	40 percent	25 percent	15 percent
Landscape Position	Mountainsides	Ridges, hilltops, and benches of mountainsides	Ridges and mountainsides
Slope	15 to 40 percent	5 to 15 percent	—
Typical Vegetation	Singleleaf Pine (Pinus monophylla); Curlleaf Mountain Mahogany (Cerocapus ledifolius); Big Sagebrush (Artemesia tridentata)	Low Sagebrush (Artemesia arbuscula); Squirreltail (Sitanion spp.)	—

Soil Profile Description

Surface Layer	1 to 0 inch; Litter 0 to 12 inches; light brownish gray & grayish brown very cobbly sandy loam & gravelly loam; weak very coarse platy & weak medium subangular blocky structure; moderately alkaline	0 to 4 inches; brown gravelly & very gravelly sandy loam; weak fine granular & weak subangular blocky structure; slightly to medium acid	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	12 to 22 inches; yellowish brown gravelly sandy clay loam; strong fine & medium subangular blocky structure; moderately alkaline	4 to 15 inches; brown gravelly clay loam; moderate fine & medium subangular blocky structure; neutral	—
Substratum	22 inches; weathered rhyolite bedrock (paralithic contact)	15 inches; basalt bedrock	—

Soil Properties

Restrictive Layer Depth	21 to 24 inches PARA	10 to 20 inches HB	—
Effective Rooting Depth (inches)	21 to 24 inches	10 to 20 inches	—
Available Water Capacity	Low (2.4 to 3.4 inches)	Very low to low (1.3 to 3.2 inches)	—
Water Retention Class	1 to 2 (2.1 to 2.7 inches)	1 to 2 (1.3 to 3.2 inches)	—
Hydrologic Soil Group	C	D	—
Permeability (in./hr.)	0.2 to 0.6	0.2 to 0.6	—
Drainage Class	Well drained	Well drained	—
Runoff	Rapid	Medium	—
Max Erosion Hazard	High	Moderate	—
Erosion Factor (k)			
Surface	0.10 (low)	0.02 (low.)	—
Subsurface	0.28 (moderate)	0.24 (moderate)	—
T Value	2	1	—
Wind Erodability Group	8	8	—

177 - Toeja - Merlin families - Rock outcrop (continued)

Soil Manageability Group	II	II	II
Class	3Ex	2edpx	—

Range Interpretations

Productivity (lb/acre)	600 to 1000	200 to 250	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; high erosion hazard; 15% rock outcrop	Plant competition; high erosion hazard; 15% rock outcrop	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	5-8% slopes: Moderate - large & small stones; percs slowly 8-15% slopes: Moderate - slope; large & small stones; percs slowly	—
Picnic Areas	Severe: Slope	5-8% slopes: Moderate - large & small stones 8-15% slopes: Moderate - slope; large & small stones	—
Paths & Trails	15-25% slopes: Moderate - slope; large stones 25-40% slopes: Severe - slope	Moderate: large & small stones	—

Engineering Interpretations

Unified Class			
Surface	SM	SM-SC	—
Subsoil	SM	ML	—
Substratum	—	—	—
AASHTO Class			
Surface	A-4	A-2-4; A-4	—
Subsoil	A-2-7	A-7-6	—
Substratum	—	—	—
Suitability for			
Sand	Poor: Excess fines	Unsuited	—
Gravel	Unsuited	Unsuited	—
Topsoil	Poor: Slope; small stones	Poor: small stones; area reclaim	—
Roadfill	15-25% slopes: Poor - area reclaim 25-40% slopes: Poor - slope; area reclaim	Poor: Low strength; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of St. Marys family, 15 to 30 percent slopes, on mountain toeslopes; and a soil similar to the Berent family, but cooler, on 5 to 15 percent slopes, on sand dunes in valleys. Included areas make up approximately 20 percent of the map unit area.

Rock outcrop is basalt

178 - Trocken-Bluewing families complex, 15 to 30 percent slopes

Elevation: 3,800 to 6,320 feet Annual Precipitation: 6 to 7 inches

Soil Map Unit Components	Trocken family	Bluewing family
Approx Proportion	60 percent	20 percent
Landscape Position	Alluvial fans	Alluvial fans
Slope	15 to 30 percent	15 to 30 percent
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Greenfire (Menodora spp.)	Shadscale (Artiplex confertifolia); Boxthorn (Lycium spp.)

Soil Profile Description

Surface Layer	0 to 9 inches; light brownish gray & pale brown very gravelly sandy loam; weak fine granular structure; moderately alkaline	0 to 3 inches; pale brown very stony loamy fine sand; weak fine granular structure; moderately alkaline
Subsoil	—	—
Substratum	9 to 60 inches; light yellowish brown very gravelly sandy loamy; massive; moderately alkaline	3 to 60 inches; pale brown very cobbly loamy fine sand; very fine single grained; moderately alkaline

Soil Properties

Restrictive Layer Depth	24 to 60+ inches HB	Greater than 60 inches
Effective Rooting Depth (inches)	20 to 40 inches	40 to 60 inches
Available Water Capacity	Very low to low (1.3 to 4.0 inches)	Very low to low (1.8 to 2.2 inches)
Water Retention Class	2 to 3 (1.1 to 1.4 inches)	3 (0.7 to 0.9 inches)
Hydrologic Soil Group	B	A
Permeability (in./hr.)	2.0 to 6.0	6.0 to 20.0
Drainage Class	Well drained	Somewhat Excessive
Runoff	Rapid	Rapid
Max Erosion Hazard	High	Moderate to High
Erosion Factor (k)		
Surface	0.10 (low)	0.05 (low)
Subsurface	0.05 (low)	0.05 (low)
T Value	3	4
Wind Erodability Group	8	2

178 - Trocken-Bluewing families complex (continued)

Soil Manageability Group	III	III
Class	3Ep	2ep

Range Interpretations

Productivity (lb/acre)	300 to 400	100 to 300
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; high erosion hazard	Plant competition; high erosion hazard

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; large stones
Picnic Areas	Severe: Slope	Severe: Slope; large stones
Paths & Trails	15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - slope	Severe: Slope; large stones

Engineering Interpretations

Unified Class		
Surface	SM	SM-SC
Subsoil	—	—
Substratum	GW-GM; GM-GC	GW-GM
AASHTO Class		
Surface	A-1-b; A-2-4	A-2-4
Subsoil	—	—
Substratum	A-1-a; A-1-b; A-2-4	A-1-b; A-2-4
Suitability for		
Sand	Unsuited	Poor: Excess fines
Gravel	Poor: Excess fines	Fair: Excess fines; large stones
Topsoil	Poor: Slope; small stones	Poor: Slope; large & small stones
Roadfill	15-25% slopes: Fair - slope 25-30% slopes: Poor - slope	15-25% slopes: Fair - slope; large stones 25-30% slopes: Poor - slope

Included Areas & Remarks

Included in this map unit are small areas of the Slinger family, on alluvial fans; and Lithic Camborthids, on sideslopes of alluvial fans. Included areas make up approximately 20 percent of the map unit area.

179 - Trocken family - Rock outcrop, metasedimentary complex, 60 to 80 percent slopes

Elevation: 4,800 to 8,000 feet Annual Precipitation: 9 inches

Soil Map Unit Components	Trocken family	Rock outcrop, metasedimentary
Approx Proportion	40 percent	25 percent
Landscape Position	Mountainsides & tops	Mountainsides & ridges
Slope	60 to 80 percent	—
Typical Vegetation	Big Sagebrush (Artemesia tridentata); Greenfire (Menodora spp.)	

Soil Profile Description

Surface Layer	0 to 9 inches; light brownish gray & pale brown very gravelly sandy loam; weak fine granular structure; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	—	—
Substratum	9 to 60 inches; light yellowish brown very gravelly sandy loam; massive; moderately alkaline	—

Soil Properties

Restrictive Layer Depth	24 to 60+ inches HB	—
Effective Rooting Depth (inches)	20 to 40 inches	—
Available Water Capacity	Very low to low (1.3 to 4.0 inches)	—
Water Retention Class	2 to 3 (1.1 to 1.4 inches)	—
Hydrologic Soil Group	B	—
Permeability (in./hr.)	2.0 to 6.0	—
Drainage Class	Well drained	—
Runoff	Very Rapid	—
Max Erosion Hazard	Very High	—
Erosion Factor (k)		
Surface	0.10 (low)	—
Subsurface	0.05 (low)	—
T Value	3	—
Wind Erodability Group	8	—

179 - Trocken family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4EGXp	—

Range Interpretations

Productivity (lb/acre)	300 to 400	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition; 25% rock outcrop; very high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	SM	—
Subsoil	—	—
Substratum	GW-GM; GM-GC	—
AASHTO Class		
Surface	A-1-b; A-2-4	—
Subsoil	—	—
Substratum	A-1-a; A-1-b; A-2-4	—
Suitability for		
Sand	Unsuited	—
Gravel	Poor: Excess fines	—
Topsoil	Poor: Slope; small stones	—
Roadfill	Poor: Slope	—

Included Areas & Remarks

Included in this map unit are small areas of the Trocken family, 30 to 60 percent slopes, on mountainsides; a soil similar to the Hartig family, but warmer, 30 to 80 percent slopes, on mountain tops with tuff intrusions; a soil similar to the Mexispring family, but shallow to hard bedrock, on mountainsides, near rock outcroppings; and schistose rubbleland, on mountainsides. Included areas make up approximately 35 percent of the map unit area.

Rock outcrop is schistose.

180 - Trocken - Midas families association, 5 to 60 percent slopes

Elevation: 5,200 to 7,750 feet Annual Precipitation: 9 inches

Soil Map Unit Components	Trocken family	Midas family
Approx Proportion	50 percent	20 percent
Landscape Position	Sideslopes of alluvial fans	Alluvial fan tops and stable ridge crests
Slope	30 to 60 percent	5 to 30 percent
Typical Vegetation	Big Sagebrush (Artemesia tridentata); Greenfire (Mendora spp.)	Greenfire (Menodora spp.); Fourwing Saltbrush (Atriplex canescens)

Soil Profile Description

Surface Layer	0 to 9 inches; light brownish gray & pale brown very gravelly sandy loam; weak fine granular structure; moderately alkaline	0 to 4 inches; pale brown very gravelly sandy loam; weak fine granular structure; strongly effervescent; moderately alkaline
Subsoil	—	4 to 14 inches; light yellowish brown very gravelly sandy loam; massive; strongly effervescent; moderately alkaline
Substratum	9 to 60 inches; light yellowish brown very gravelly sandy loam; massive; moderately alkaline	14 to 60 inches; light yellowish brown very gravelly & extremely gravelly loamy sand; massive; moderately alkaline

Soil Properties

Restrictive Layer Depth	24 to 60+ inches HB	Greater than 60 inches
Effective Rooting Depth (inches)	20 to 40 inches	20 to 40 inches
Available Water Capacity	Very low to low (1.3 to 4.0 inches)	Very low to low (1.8 to 2.4 inches)
Water Retention Class	2 to 3 (1.1 to 1.4 inches)	3 (1.0 to 1.2 inches)
Hydrologic Soil Group	B	B
Permeability (in./hr.)	2.0 to 6.0	2.0 to 6.0
Drainage Class	Well drained	Well drained
Runoff	Rapid to Very Rapid	Medium to Rapid
Max Erosion Hazard	High to Very High	High to Very High
Erosion Factor (k)		
Surface	0.10 (low)	0.10 (low)
Subsurface	0.05 (low)	0.17 (low)
T Value	3	2
Wind Erodability Group	8	8
Soil Manageability		
Group	III	III
Class	3Egp	4EP

180 - Trocken - Midas families association (continued)

Range Interpretations		
Productivity (lb/acre)	300 to 400	300 to 400
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; very high erosion hazard; steep slopes	Plant competition; very high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	5-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones 15-30% slopes: Severe - slope
Picnic Areas	Severe: Slope	5-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones 15-30% slopes: Severe - slope
Paths & Trails	Severe: Slope	5-15% slopes: Moderate - small stones 15-25% slopes: Moderate - slope; small stones 25-30% slopes: Severe - slope

Engineering Interpretations

Unified Class		
Surface	SM	GW-GM; GM-GC
Subsoil	—	SM-SC
Substratum	GW-GM; GM-GC	SW-SM; SM-SC
AASHTO Class		
Surface	A-1-b; A-2-4	A-1-a; A-1-b; A-2-4
Subsoil	—	A-2-4; A-4
Substratum	A-1-a; A-1-b; A-2-4	A-1-a; A-1-b; A-2-4
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Poor: Excess fines	Fair: Excess fines
Topsoil	Poor: Slope; small stones; area reclaim	5-15% slopes: Poor - small stones 15-30% slopes: Poor - slope; small stones
Roadfill	Poor: Slope	5-15% slopes: Fair - large stones 15-25% slopes: Fair - slope; large stones 25-30% slopes: Poor - slope

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Bluewing family, but shallow to fractured hardpan, 30 to 60 percent slopes, on upper erosional shoulders of alluvial fans; a soil similar to the Spanel family, but with more than 35 percent rock fragments in the profile, 5 to 15 percent slopes, on stable ridgecrests; a soil similar to the Spanel family, but with a degrading hardpan, 5 to 15 percent slopes, on stable sloping fans. Included areas make up approximately 30 percent of the map unit area.

181 - Tweedy - Abgese families association, 1 to 15 percent slopes

Elevation: 6,950 to 8,050 feet Annual Precipitation: 10 to 11 inches

Soil Map Unit Components	Tweedy family	Abgese family
Approx Proportion	65 percent	20 percent
Landscape Position	Basalt flow tops	Sideslopes of basalt flows
Slope	1 to 9 percent	9 to 15 percent
Typical Vegetation	Juniper (Juniperus spp.); Singleleaf Pinyon (Pinus monophylla)	Big Sagebruush (Artemesia tridentata); Singleleaf Pinyon Pine (Pinus monophylla)

Soil Profile Description

Surface Layer	0 to 7 inches; grayish brown sandy loam; weak fine granular & weak fine subangular blocky structure; neutral	0 to 5 inches; brown sandy loam; weak fine granular structure; mildly alkaline
Subsoil	7 to 32 inches; brown & yellowish brown clay loam, gravelly clay loam & gravelly sandy loam; weak to strong very fine, fine, medium & coarse subangular blocky structure; neutral	5 to 16 inches; yellowish brown sandy loam & gravelly sandy loam; moderate medium subangular blocky structure & massive; mildly alkaline
Substratum	32 to 38 inches; pale brown very gravelly sand; massive; neutral	16 to 60 inches; yellowish brown very gravelly sandy loam; massive; mildly alkaline
	38 inches; hard basalt bedrock	

Soil Properties

Restrictive Layer Depth	20 to 40 inches HB	Greater than 60 inches
Effective Rooting Depth (inches)	20 to 40 inches	40 to 60 inches
Available Water Capacity	Low to moderate (2.0 to 5.0 inches)	Moderate (4.6 to 5.7 inches)
Water Retention Class	1 (2.6 to 3.2 inches)	2 (1.7 to 2.1 inches)
Hydrologic Soil Group	C	B
Permeability (in./hr.)	0.2 to 0.6	2.0 to 6.0
Drainage Class	Well drained	Well drained
Runoff	Slow to Medium	Medium
Max Erosion Hazard	Moderate	Moderate
Erosion Factor (k)		
Surface	0.20 (moderate)	0.15 (low)
Subsurface	0.28 (moderate)	0.17 (low)
T Value	2	3
Wind Erodability Group	3	3

181 - Tweedy - Abgese families association (continued)

Soil Manageability		
Group	II	II
Class	2e	2ep

Range Interpretations

Productivity (lb/acre)	400 to 600	500 to 700
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition	Plant competition

Recreation Interpretations - Limitations for

Camp Areas	1-8% slopes: Moderate - percs slowly 8-9% slopes: Moderate - slope; percs slowly	Moderate: Slope
Picnic Areas	1-8% slopes: Slight 8-9% slopes: Moderate - slope	Moderate: Slope
Paths & Trails	Slight	Slight

Engineering Interpretations

Unified Class		
Surface	SM	SM-SC
Subsoil	CL	SM-SC
Substratum	SP	SM
AASHTO Class		
Surface	A-2-4; A-4	A-2-4
Subsoil	A-4	A-2-4
Substratum	A-1-a; A-1-b; A-2-4	A-1-b; A-2-4
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Unsuited	Unsuited
Topsoil	1-8% slopes: Fair - small stones 8-9% slopes: Fair - slope; small stones	Fair: Slope; small stones
Roadfill	Poor: Area reclaim	Good

Included Areas & Remarks

Included in this map unit are small areas of the Preston family, 1 to 9 percent slopes, on stabilized sand dunes; the Wrango family, 9 to 15 percent slopes, in transitional areas between the sand dunes and the Abgese soil; and a soil similar to the Wrango family, but with a stratified profile, 1 to 9 percent slopes, in drainages. Included areas make up approximately 15 percent of the map unit area.

182 - Typic Haplargids - Vipont - Spaa families complex, 5 to 70 percent slopes

Elevation: 7,080 to 10,250 feet Annual Precipitation: 9 to 10 inches

Soil Map Unit Components	Typic Haplargids	Vipont family	Spaa family
Approx Proportion	30 percent	25 percent	25 percent
Landscape Position	Mountainsides	Mountainsides	Ridges & mountainsides
Slope	15 to 60 percent	60 to 70 percent	5 to 60 percent
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big sagebrush (Artemisia tridentata)	Big Sagebrush (Artemisia tridentata); Ephedra spp.; Bluegrass (Poa spp.)	Big Sagebrush (Artemisia tridentata); Curlleaf Mountain Mahogany (Cercocarpus ledifolius)

Soil Profile Description

Surface Layer	0 to 2 inches; light reddish brown & white very gravelly clay loam; weak very fine & fine subangular blocky structure; mildly alkaline	0 to 17 inches; grayish brown & brown extremely cobbly loamy sand & cobbly & very cobbly sandy loam; weak fine subangular blocky structure & massive; moderately alkaline	0 to 3 inches; brown very cobbly sandy loam; weak medium & coarse platy structure; medium acid
Subsoil	2 to 15 inches; light reddish brown clay; moderate medium prismatic structure; slightly to strongly effervescent; moderately alkaline	17 to 35 inches; brown & light yellowish brown very cobbly sandy loam & very gravelly clay loam; massive; moderately alkaline	—
Substratum	15 to 43 inches; brown, pinkish gray & white loam & very gravelly loam; massive; violently effervescent; moderately alkaline 43 inches; rhyolite tuff (paralithic contact)	35 to 60 inches; light yellowish brown & pale brown extremely cobbly sandy loam; massive; violently effervescent; moderately alkaline	3 to 16 inches; brown & pale brown sandy loam & gravelly sandy loam; weak fine & medium subangular blocky structure; slightly acid 16 inches; hard rhyolite bedrock

Soil Properties

Restrictive Layer Depth	22 to 60 inches PARA	Greater than 60 inches	12 to 16 inches HB
Effective Rooting Depth (inches)	20 to 40 inches	40 to 60 inches	10 to 16 inches
Available Water Capacity	Low to moderate (2.3 to 7.5 inches)	Low (2.8 to 3.6 inches)	Very low (0.9 to 1.6 inches)
Water Retention Class	1 (2.6 to 3.1 inches)	2 to 3 (0.9 to 1.3 inches)	2 to 3 (0.9 to 1.6 inches)
Hydrologic Soil Group	D	B	D
Permeability (in./hr.)	0.06 to 0.20	0.2 to 0.6	2.0 to 6.0
Drainage Class	Well drained	Well drained	Well drained
Runoff	Rapid to Very Rapid	Very Rapid	Medium to Very Rapid
Max Erosion Hazard	High	High	Moderate to High
Erosion Factor (k) Surface Subsurface	 0.10 (low) 0.20 (moderate)	 0.02 (low) 0.15 (low)	 0.10 (low) 0.24 (moderate)
T Value	3	3	1
Wind Erodability Group	8	8	8

182 - Typic Haplargids - Vipont - Spaa families complex (continued)

Soil Manageability			
Group	IV	IV	IV
Class	3Egx	4EGPx	4EPdgx

Range Interpretations

Productivity (lb/acre)	400 to 600	500 to 700	600 to 1000
Suitability	Summer - Autumn	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 25% shallow soils; 10% rock outcrop; high erosion hazard; steep slopes	Plant competition; 25% shallow soils; 10% rock outcrop; high erosion hazard; steep slopes	Plant competition; 25% shallow soils; 10% rock outcrop; high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; large stones	5-8% slopes: Moderate - large & small stones; too sandy 8-15% slopes: Moderate - slope; large & small stones; too sandy 15-60% slopes: Severe - slope
Picnic Areas	Severe: Slope	Severe: Slope; large stones	5-8% slopes: Moderate - large & small stones; too sandy
Paths & Trails	Severe: Slope	Severe: Slope; large stones	8-15% slopes: Moderate - slope; large & small stones; too sandy 15-60% slopes: Severe - slope

Engineering Interpretations

Unified Class			
Surface	GM	SM	SM; SW-SM
Subsoil	ML	SC	—
Substratum	SM-SC	GM; GW-GM	SM
AASHTO Class			
Surface	A-2-6	A-2-4	A-1-b; A-2-4
Subsoil	A-7-6	A-2-4	—
Substratum	A-2-4; A-4	A-1-a; A-1-b; A-2-4	A-2-4
Suitability for			
Sand	Unsuited	Unsuited	Poor: Excess fines
Gravel	Unsuited	Unsuited	Unsuited
Topsoil	Poor: Slope; too clayey; small stones	Poor: Slope; large stones	5-15% slopes: Poor - small stones; area reclaim 15-60% slopes: Poor - slope; small stones; area reclaim
Roadfill	Poor: Slope	Poor: Slope; large stones	5-25% slopes: Poor - area reclaim 25-60% slopes: Poor - slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of eroded phases of the Vipont family and Typic Haplargids, 15 to 70 percent slopes, on mountainsides; and rhyolitic rock outcrop and rubbleland, on mountainsides and ridges. Included areas make up approximately 20 percent of the map unit area.

183 - Typic Xerorthents, 2 to 15 percent slopes

Elevation: 6,700 to 7,800 feet Annual Precipitation: 8 inches

Soil Map Unit Components	**Typic Xerorthents**
Approx Proportion	65 percent
Landscape Position	Alluvial depressions
Slope	2 to 15 percent
Typical Vegetation	Saltgrass (Distichlis spp.); Rabbitbrush (Chryosothamnus spp.)

Soil Profile Description

Surface Layer	0 to 4 inches; light brownish gray gravelly sand & loamy sand; weak fine granular & weak very fine subangular blocky structure; slightly acid
Subsoil	—
Substratum	4 to 60 inches; light brownish gray, & pale brown loamy sand, gravelly sandy loam & very cobbly loamy sand; weak very fine, fine, medium & coarse subangular blocky structure & massive; neutral

Soil Properties

Restrictive Layer Depth	Greater than 60 inches
Effective Rooting Depth (inches)	20 to 40 inches
Available Water Capacity	Low to moderate (3.4 to 4.4 inches)
Water Retention Class	2 (1.4 to 1.8 inches)
Hydrologic Soil Group	B
Permeability (in./hr.)	2.0 to 6.0
Drainage Class	Well drained
Runoff	Slow to Medium
Max Erosion Hazard	High
Erosion Factor (k)	
Surface	0.05 (low)
Subsurface	0.10 (low)
T Value	3
Wind Erodability Group	1

183 - Typic Xerorthents (continued)

Soil Manageability	
Group	III
Class	3Ep

Range Interpretations

Productivity (lb/acre)	200 to 400
Suitability	Summer - Autumn
Most Limiting Factors	Plant competition; high erosion hazard

Recreation Interpretations - Limitations for

Camp Areas	Severe: Too sandy
Picnic Areas	Severe: Too sandy
Paths & Trails	Severe: Too sandy

Engineering Interpretations

Unified Class	
Surface	SM
Subsoil	—
Substratum	SM
AASHTO Class	
Surface	A-2-4
Subsoil	—
Substratum	A-1-b; A-2-4
Suitability for	
Sand	Poor: Excess fines
Gravel	Unsuited
Topsoil	Poor: Small stones
Roadfill	Good

Included Areas & Remarks

Included in this map unit are small areas of the Berent family and Typic Xerorthents, in alluvial depressions; a soil similar to the Trocken family, but with silty textures in the profile, in playas and depressions; and the Unionville family, 1 to 9 percent slopes, in valley bottoms. Included areas make up approximately 35 percent of the map unit area.

184 - Unionville - Risue families - Rock outcrop, volcanic complex, 5 to 30 percent slopes

Elevation: 6,720 to 8,000 feet Annual Precipitation: 11 inches

Soil Map Unit Components	Unionville family	Risue family	Rock outcrop, volcanic
Approx Proportion	50 percent	20 percent	15 percent
Landscape Position	lava flows	lava flows	lava flows
Slope	5 to 30 percent	5 to 30 percent	—
Typical Vegetation	Juniper (Juniperus spp.); Big Sagebrush (Artemisia tridentata)	Big Sagebrush (Artemisia tridentata); Rabbitbrush (Chryothamnus spp.)	—
Soil Profile Description			
Surface Layer	0 to 4 inches; brown gravelly sandy loam; weak thin platy structure; moderately alkaline	0 to 6 inches; pale brown cobbly loamy sand & loamy sand; weak very fine granular & weak fine & medium subangular blocky structure; neutral	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	4 to 26 inches; pale brown sandy loam; weak medium subangular blocky structure sightly effervescent; moderately alkaline	6 to 16 inches; yellowish brown & brown sandy clay loam & clay; strong very fine, fine, medium & coarse subangular blocky structure; neutral	—
Substratum	26 to 60 inches; pale brown & light yellowish brown gravelly sandy loam; massive; violently effervescent; moderately alkaline	16 inches; silica-cemented hardpan	—
Soil Properties			
Restrictive Layer Depth	35 to 60+ inches HB	16 inches DP	—
Effective Rooting Depth (inches)	20 to 40 inches	16 inches	—
Available Water Capacity	low to moderate (2.8 to 6.3 inches)	Very low (1.6 to 2.0 inches)	—
Water Retention Class	2 (1.8 to 2.4 inches)	2 (1.6 to 2.0 inches)	—
Hydrologic Soil Group	B	D	
Permeability (in./hr.)	2.0 to 6.0	Less than 0.06	—
Drainage Class	Well drained	Well drained	—
Runoff	Medium to Rapid	Medium to Rapid	—
Max Erosion Hazard	High	Moderate to High	—
Erosion Factor (k)			
Surface	0.17 (low)	0.10 (low)	—
Subsurface	0.32 (moderate)	0.15 (low)	—
T Value	2	1	—
Wind Erodability Group	3	8	—
Soil Manageability			
Group	III	III	III
Class	3Epx	2edpx	—

184 - Unionville - Risue families - Rock outcrop (continued)

Range Interpretations			
Productivity (lb/acre)	400 to 600	500 to 700	—
Suitability	Summer - Autumn	Summer - Autumn	—
Most Limiting Factors	Plant competition; 20% shallow soils; 15% rock outcrop; high erosion hazard	Plant competition; 20% shallow soils; 15% rock outcrop; high erosion hazard	—

Recreation Interpretations - Limitations for

Camp Areas	5-8% slopes: slight 8-15% slopes: moderate - slope 15-30% slopes: Severe - slope	5-15% slopes: Severe - percs slowly 15-30% slopes: Severe - slope; percs slowly	—
Picnic Areas	5-8% slopes: slight 8-15% slopes: moderate - slope 15-30% slopes: Severe - slope	5-8% slopes: Moderate - small stones; too sandy 8-15% slopes: Moderate - slope; small stones; too sandy 15-30% slopes: Severe - slope	—
Paths & Trails	5-15% slopes: Slight 15-25% slopes: moderate - slope 25-30% slopes: Severe - slope	5-15% slopes: Moderate - large stones; too sandy 15-25% slopes: Moderate - slope; large stones; too sandy 25-30% slopes: Severe - slope	—

Engineering Interpretations

Unified Class			
Surface	SM	SM	—
Subsoil	SM	ML	—
Substratum	SM	SC	—
AASHTO Class			
Surface	A-1-b; A-2-4	A-2-4	—
Subsoil	A-2-4	A-7-6	—
Substratum	A-1-b; A-2-4	A-4	—
Suitability for			
Sand	Poor: Excess fines	Unsuited	—
Gravel	Unsuited	Unsuited	—
Topsoil	5-8% slopes: Fair - small stones 8-15% stones: Fair - slope; small stones 15-30% slopes: Poor - slope	5-15% slopes: Poor - area reclaim 15-30% slopes: Poor - slope; area reclaim	—
Roadfill	5-15% slopes: Good 15-25% slopes: Fair - slope 25-30% slopes: Poor - slope	5-25% slopes: Poor - low strength; area reclaim 25-30% slopes: Poor - slope; low strength; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Berent family, 5 to 15 percent slopes, in depressions; and the Bondranch family, on upper mountainsides, in eroded areas. Included areas make up approximately 15 percent of the map unit area.

Rock outcrop is basalt

185 - Washoe - Checkett - Mulett families association, 30 to 60 percent slopes

Elevation: 5,000 to 9,000 feet Annual Precipitation: 8 to 9 inches

Soil Map Unit Components	Washoe family	Checkett family	Mulett family
Approx Proportion	35 percent	20 percent	15 percent
Landscape Position	Mid to lower mountainsides	Ridge tops and upper mountainsides	Sideslopes of ridge tops
Slope	30 to 60 percent	30 to 60 percent	30 to 60 percent
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)
Soil Profile Description			
Surface Layer	0 to 4 inches; light brownish gray very gravelly sandy loam; weak very thin platy structure; neutral	0 to 6 inches; pale brown gravelly fine sandy loam; weak fine granular structure; moderately alkaline	0 to 6 inches; pale brown sandy loam & very gravelly sandy clay loam; weak fine granular structure; mildly alkaline
Subsoil	4 to 19 inches; light brown very gravelly clay loam & sandy clay loam; massive; neutral	6 to 19 inches; yellowish brown very gravelly & very cobbly sandy clay loam; moderate medium subangular blocky structure; moderately alkaline	6 to 13 inches; light yellowish brown very gravelly clay loam; moderate medium subangular blocky structure; mildly alkaline
Substratum	19 to 60 inches; light yellowish brown extremely gravelly sandy loam & loamy sand; massive; strongly to violently effervescent; moderately alkaline	19 inches; hard metasedimentary bedrock	13 inches; hard noncalcareous sedimentary bedrock
Soil Properties			
Restrictive Layer Depth	23 to 60+ inches FB	19 to 19 inches HB	10 to 20 inches HB
Effective Rooting Depth (inches)	20 to 40 inches	9 to 19 inches	10 to 20 inches
Available Water Capacity	Very low to low (0.7 to 2.5 inches)	Very low to low (0.8 to 2.1 inches)	Very low to low (1.0 to 2.5 inches)
Water Retention Class	2 (1.3 to 1.6 inches)	2 to 3 (0.8 to 2.1 inches)	2 to 3 (1.0 to 2.5 inches)
Hydrologic Soil Group	B	D	D
Permeability (in./hr.)	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6
Drainage Class	Well drained	Well drained	Well drained
Runoff	Rapid to Very Rapid	Rapid to Very Rapid	Rapid to Very Rapid
Max Erosion Hazard	Moderate to High	Moderate to High	Moderate to High
Erosion Factor (k)			
Surface	0.05 (low)	0.15 (low)	0.15 (low)
Subsurface	0.15 (low)	0.10 (low)	0.10 (low)
T Value	3	1	1
Wind Erodability Group	8	8	3

185 - Washoe - Checkett - Mulett families association (continued)

Soil Manageability Group	III	III	III
Class	3Egpx	4EPdgx	3Edgpx

Range Interpretations

Productivity (lb/acre)	400 to 500	300 to 500	300 to 500
Suitability	Summer - Autumn	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 35% shallow soils; 10% rock outcrop; high erosion hazard; steep slopes	Plant competition; 35% shallow soils; 10% rock outcrop; high erosion hazard; steep slopes	Plant competition; 35% shallow soils; 10% rock outcrop; high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope; too sandy	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope; too sandy	Severe: Slope
Paths & Trails	Severe: Slope	Severe: Slope; too sandy	Severe: Slope

Engineering Interpretations

Unified Class			
Surface	GM; GW-GM	SM-SC	SM-SC
Subsoil	SC	SC	SC
Substratum	GP	—	—
AASHTO Class			
Surface	A-1-a; A-1-b; A-2-4	A-2-4; A-4	A-2-4
Subsoil	A-2-6	A-2-4	A-2-6
Substratum	A-1-a; A-1-b; A-2-4	—	—
Suitability for			
Sand	Unsuited	Unsuited	Unsuited
Gravel	Unsuited	Unsuited	Unsuited
Topsoil	Poor: Slope; Small stones	Poor: Slope; Small stones	Poor: Slope; Small stones; area reclaim
Roadfill	Poor: Slope	Poor: Slope; area reclaim	Poor: Slope; area reclaim

Included Areas & Remarks

Included in this map unit are small areas of the Finley family, 15 to 30 percent slopes, on lower mountainsides and toeslopes; sedimentary rock outcrop, on ridges and mountainsides; the Moano family, 15 to 40 percent slopes, on ridgetops and upper mountainsides; and the Wrango family, 15 to 40 percent slopes, on lower mountainsides and toeslopes. Included areas make up approximately 30 percent of the map unit area.

186 - Washoe family - Typic Haplargids association, 30 to 60 percent slopes

Elevation: 7,120 to 9,550 feet Annual Precipitation: 9 to 10 inches

Soil Map Unit Components	Washoe family	Typic Haplargids
Approx Proportion	40 percent	30 percent
Landscape Position	Southerly and westerly-facing mountainsides	Northerly and easterly-facing mountainsides
Slope	30 to 60 percent	30 to 60 percent
Typical Vegetation	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)	Singleleaf Pinyon Pine (Pinus monophylla); Big Sagebrush (Artemisia tridentata)

Soil Profile Description

Surface Layer	0 to 4 inches; light brownish gray very gravelly sandy loam; weak very thin platy structure; neutral	0 to 2 inches; light reddish brown & white very gravelly clay loam; weak very fine & fine subangular blocky structure; mildly alkaline
Subsoil	4 to 19 inches; light brown very gravelly clay loam & sandy clay loam; massive; neutral	2 to 15 inches; light reddish brown clay; moderate medium prismatic structure; slightly to strongly effervescent; moderately alkaline
Substratum	19 to 60 inches; light yellowish brown extremely gravelly loamy sand & sandy loam; massive; strongly to violently effervescent; moderately alkaline	15 to 43 inches; brown, pinkish gray and white loam & very gravelly loam; massive; violently effervescent; moderately alkaline 43 inches; rhyolite tuff bedrock (paralithic contact)

Soil Properties

Restrictive Layer Depth	23 to 60+ inches FB	22 to 60 inches PARA
Effective Rooting Depth (inches)	20 to 40 inches	20 to 40 inches
Available Water Capacity	Very low to low (0.7 to 2.5 inches)	Low to moderate (2.3 to 7.5 inches)
Water Retention Class	2 (1.3 to 1.6 inches)	1 (2.6 to 3.1 inches)
Hydrologic Soil Group	B	D
Permeability (in./hr.)	0.2 to 0.6	0.06 to 0.02
Drainage Class	Well drained	Well drained
Runoff	Rapid to Very Rapid	Rapid to Very Rapid
Max Erosion Hazard	Moderate to High	High
Erosion Factor (k) Surface Subsurface	 0.05 (low) 0.15 (low)	 0.10 (low) 0.20 (moderate)
T Value	3	3
Wind Erodability Group	8	8

186 - Washoe family - Typic Haplargids association (continued)

Soil Manageability		
Group	III	III
Class	3Egpx	3Egx

Range Interpretations

Productivity (lb/acre)	400 to 500	400 to 600
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition; 10% rock outcrop; high erosion hazard; steep slopes	Plant competition; 10% rock outcrop; high erosion hazard; steep slopes

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	Severe: Slope
Picnic Areas	Severe: Slope	Severe: Slope
Paths & Trails	Severe: Slope	Severe: Slope

Engineering Interpretations

Unified Class		
Surface	GM; GW-GM	GM
Subsoil	SC	ML
Substratum	GP	SM-SC
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	A-2-6
Subsoil	A-2-6	A-7-6
Substratum	A-1-a; A-1-b; A-2-4	A-2-4; A-4
Suitability for		
Sand	Unsuited	Unsuited
Gravel	Unsuited	Unsuited
Topsoil	Poor: Slope; Small stones	Poor: Slope; too clayey; small stones
Roadfill	Poor: Slope	Poor: Slope

Included Areas & Remarks

Included in this map unit are small areas of rhyolitic rock outcrop, on mountainsides and ridges; the Finley family, 15 to 30 percent slopes, in valley fill plains; a soil similar to the Berning family, but cooler, 15 to 30 percent slopes, on ridges; a soil similar to St. Marys, but with a thicker dark surface layer, 15 to 30 percent slopes, in valley fill plains; and the Cath family, 15 to 30 percent slopes, on toeslopes. Included areas make up approximately 30 percent of the map unit area.

187 - Wrango family, 5 to 15 percent slopes

Elevation: 5,660 to 9,600 feet Annual Precipitation: 7 inches

Soil Map Unit Components	**Wrango family**
Approx Proportion	65 percent
Landscape Position	Dissected alluvial fans and terraces
Slope	5 to 15 percent
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Nevada Ephedra (Ephedra nevadensis); Needlegrass (Stipa spp.)

Soil Profile Description

Surface Layer	0 to 3 inches; light brownish gray gravelly loamy sand; weak thin & medium platy structure; mildly alkaline
Subsoil	—
Substratum	3 to 60 inches; brown, pale brown & very pale brown gravelly, very gravelly & extremely gravelly loamy sands; massive; none to strongly effervescent; mildly to moderately alkaline

Soil Properties

Restrictive Layer Depth	Greater than 60 inches
Effective Rooting Depth (inches)	40 to 60 inches
Available Water Capacity	Low (2.2 to 2.6 inches)
Water Retention Class	3 (0.9 to 1.1 inches)
Hydrologic Soil Group	B
Permeability (in./hr.)	2.0 to 6.0
Drainage Class	Well drained
Runoff	Medium
Max Erosion Hazard	Moderate
Erosion Factor (k)	
Surface	0.10 (low)
Subsurface	0.15 (low)
T Value	4
Wind Erodability Group	8

Soil Manageability	
Group	III
Class	3Pex

Range Interpretations

Productivity (lb/acre)	300 to 400
Suitability	Summer - Autumn
Most Limiting Factors	Plant competition

Recreation Interpretations - Limitations for

Camp Areas	5-8% slopes: Slight 8-15% slopes: Moderate - slope
Picnic Areas	3-8% slopes: Slight 8-15% slopes: Moderate - slope
Paths & Trails	Slight

Engineering Interpretations

Unified Class	
Surface	SM
Subsoil	—
Substratum	SW-SM
AASHTO Class	
Surface	A-2-4
Subsoil	—
Substratum	A-1-a; A-1-b; A-2-4
Suitability for	
Sand	Fair; Excess fines
Gravel	Unsuited
Topsoil	Poor: Small stones
Roadfill	Good

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Wrango family, but with a loamy soil profile, 10 to 15 percent slopes, on alluvial fans; a soil similar to the Mackey family, but with a sandy profile, on dissected alluvial fans and terraces; the Midas family, on dissected alluvial fans and terraces; and riverwash, in drainages. Included areas make up approximately 35 percent of the map unit area.

188 - Wrango - Mackey families complex, 3 to 15 percent slopes

Elevation: 5,020 to 7,040 feet Annual Precipitation: 7 to 10 inches

Soil Map Unit Components	Wrango family	Mackey family
Approx Proportion	50 percent	30 percent
Landscape Position	Young dissected alluvial fans	Young dissected alluvial fans
Slope	3 to 15 percent	3 to 15 percent
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Nevada Ephedra (Ephedra nevadensis) Needlegrass (Stipa spp.)	Big Sagebrush (Artemisia tridentata); Goldenbush (Haplopappus spp.)

Soil Profile Description

Surface Layer	0 to 3 inches; light brownish gray gravelly loamy sand; weak thin & medium platy structure; mildly alkaline	0 to 3 inches; brown gravelly sandy loam; weak fine granular structure; mildly alkaline
Subsoil	—	3 to 42 inches; brown and yellowish brown very gravelly sandy loam; weak medium subangular blocky structure & massive; none to slightly effervescent; mildly to moderately alkaline
Substratum	3 to 60 inches; brown, pale brown, & very pale brown gravelly, very gravelly & extremely gravelly loamy sands; massive; none to strongly effervescent; mildly to moderately alkaline	42 to 60 inches; light brownish gray extremely gravelly loamy sand; massive; strongly effervescent; moderately alkaline

Soil Properties

Restrictive Layer Depth	Greater than 60 inches	Greater than 60 inches
Effective Rooting Depth (inches)	40 to 60 inches	20 to 40 inches
Available Water Capacity	Low (2.2 to 2.6 inches)	Low (2.7 to 3.6 inches)
Water Retention Class	3 (0.9 to 1.1 inches)	2 (1.2 to 1.6 inches)
Hydrologic Soil Group	B	B
Permeability (in./hr.)	2.0 to 6.0	2.0 to 6.0
Drainage Class	Well	Well drained
Runoff	Slow to Medium	Slow to Medium
Max Erosion Hazard	Moderate	High
Erosion Factor (k)		
Surface	0.10 (low)	0.05 (low)
Subsurface	0.15 (low)	0.10 (low)
T Value	4	4
Wind Erodability Group	8	3

188 - Wrango - Mackey families complex (continued)

Soil Manageability Group	III	III
Class	3Pe	3Ep

Range Interpretations

Productivity (lb/acre)	300 to 400	300 to 400
Suitability	Summer - Autumn	Summer - Autumn
Most Limiting Factors	Plant competition	Plant competition

Recreation Interpretations - Limitations for

Camp Areas	3-8% slopes: Slight 8-15% slopes: Moderate - slope	3-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones
Picnic Areas	3-8% slopes: slight 8-15% slopes: moderate - slope	3-8% slopes: Moderate - small stones 8-15% slopes: Moderate - slope; small stones
Paths & Trails	Slight	Moderate: Small stones

Engineering Interpretations

Unified Class		
Surface	SM	SM
Subsoil	—	SW-SM; SM-SC
Substratum	SW-SM	GW-GM
AASHTO Class		
Surface	A-2-4	A-1-b; A-2-4
Subsoil	—	A-1-a; A-1-b; A-2-4
Substratum	A-1-a; A-1-b; A-2-4	A-1-a; A-1-b; A-2-4
Suitability for		
Sand	Fair; Excess fines	Unsuited
Gravel	Unsuited	Unsuited
Topsoil	Poor: Small stones	Poor: Small stones
Roadfill	Good	Good

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Typic Xerorthents soil, but drier, on young dissected alluvial fans; and the Trocken family, on young alluvial fans. Included areas make up approximately 20 percent of the map unit area.

189 - Yuko family - Rock outcrop, granitic association, 15 to 30 percent slopes

Elevation: 6,400 to 8,400 feet Annual Precipitation: 8 inches

Soil Map Unit Components	Yuko family	Rock outcrop, granitic
Approx Proportion	50 percent	20 percent
Landscape Position	Mountainsides	Ridgetops and convex mountainsides
Slope	15 to 30 percent	—
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Ephedra spp.	—

Soil Profile Description

Surface Layer	0 to 4 inches; brown very gravelly sandy loam; single grained; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	4 to 10 inches; yellowish brown & brown gravelly sandy clay loam & sandy loam; moderate medium subangular blocky structure & massive; moderately alkaline	—
Substratum	10 inches; Degraded granodiorite bedrock (paralithic contact)	—

Soil Properties

Restrictive Layer Depth	10 to 18 inches PARA	—
Effective Rooting Depth (inches)	10 to 18 inches	—
Available Water Capacity	Very low (0.9 to 2.0 inches)	—
Water Retention Class	2 to 3 (0.9 to 2.0 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	0.2 to 0.6	—
Drainage Class	Moderately well drained	—
Runoff	Rapid	—
Max Erosion Hazard	High	—
Erosion Factor (k)		
Surface	0.05 (low)	—
Subsurface	0.10 (low)	—
T Value	1	—
Wind Erodability Group	8	—

189 - Yuko family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4EPXd	—

Range Interpretations

Productivity (lb/acre)	300 to 400	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition: 50% shallow soils; 20% rock outcrop; high erosion hazard	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	15-25% slopes: Moderate - slope; small stones; 25-30% slopes: Severe - slope	—

Engineering Interpretations

Unified Class		
Surface	SW-SM; SM-SC	—
Subsoil	SM	—
Substratum	—	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	A-2-4	—
Substratum	—	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; small stones; area reclaim	—
Roadfill	Poor: Slope; area reclaim 15-25% slopes: Poor - area reclaim 25-30% slopes: Poor - slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of the Trocken family, on mountainsides; a soil similar to the Mascamp family, but warmer, and with soft bedrock, on upper mountainsides; and a soil similar to the Moano family, but with soft bedrock, 9 to 15 percent slopes, on pediment slopes. Included areas make up approximately 30 percent of the map unit area.

190 - Yuko family - Rock outcrop, granitic association, 30 to 60 percent slopes

Elevation: 5,520 to 9,120 feet Annual Precipitation: 8 inches

Soil Map Unit Components	Yuko family	Rock outcrop, granitic
Approx Proportion	40 percent	30 percent
Landscape Position	Mountainsides	Ridge tops and convex mountainsides
Slope	30 to 60 percent	—
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Ephedra spp.	—

Soil Profile Description

Surface Layer	0 to 4 inches; brown very gravelly sandy loam; single grained; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	4 to 10 inches; yellowish brown & brown gravelly sandy clay loam & sandy loam; moderate medium subangular blocky structure & massive; moderately alkaline	—
Substratum	10 inches; Degraded granodiorite bedrock (paralithic contact)	—

Soil Properties

Restrictive Layer Depth	10 to 18 inches PARA	—
Effective Rooting Depth (inches)	10 to 18 inches	—
Available Water Capacity	Very low (0.9 to 2.0 inches)	—
Water Retention Class	2 to 3 (0.9 to 2.0 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	0.2 to 0.6	—
Drainage Class	Moderately well drained	—
Runoff	Rapid to very rapid	—
Max Erosion Hazard	Very high	—
Erosion Factor (k)		
Surface	0.05 (low)	—
Subsurface	0.10 (low)	
T Value	1	—
Wind Erodability Group	8	—

190 - Yuko family - Rock outcrop (continued)

Soil Manageability		
Group	IV	IV
Class	4EPXdg	—

Range Interpretations

Productivity (lb/acre)	300 to 400	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition: 40% shallow soils; 30% rock outcrop; very high erosion hazard; steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	SW-SM; SM-SC	—
Subsoil	SM	—
Substratum	—	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	A-2-4	—
Substratum	—	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; area reclaim; small stones	—
Roadfill	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to the Brad family, but warmer, and with soft bedrock, on upper mountainsides; a soil similar to the Slinger family, but warmer, and less than 20 inches to bedrock, on mountainsides; and a soil similar to the Wrango family, but less than 20 inches to soft bedrock, 15 to 30 percent slopes, on pediment slopes. Included areas make up approximately 30 percent of the map unit area.

191 - Yuko family - Rock outcrop, granitic association, 60 to 80 percent slopes

Elevation: 4,000 to 8,400 feet Annual Precipitation: 8 inches

Soil Map Unit Components	Yuko family	Rock outcrop, granitic
Approx Proportion	40 percent	35 percent
Landscape Position	Mountainsides	Ridgetops and convex mountainsides
Slope	60 to 80 percent	—
Typical Vegetation	Big Sagebrush (Artemisia tridentata); Ephedra spp.	—

Soil Profile Description

Surface Layer	0 to 4 inches; brown very gravelly sandy loam; single grained; moderately alkaline	Rock outcrop consists of contiguous bare bedrock and less than 15 percent inclusions of soil material capable of supporting plants
Subsoil	4 to 10 inches; yellowish brown & brown gravelly sandy clay loam and sandy loam; moderate medium subangular blocky structure & massive; moderately alkaline	—
Substratum	10 inches; Degraded granodiorite bedrock (paralithic contact)	—

Soil Properties

Restrictive Layer Depth	10 to 18 inches PARA	—
Effective Rooting Depth (inches)	10 to 18 inches	—
Available Water Capacity	Very low (0.9 to 2.0 inches)	—
Water Retention Class	2 to 3 (0.9 to 2.0 inches)	—
Hydrologic Soil Group	D	—
Permeability (in./hr.)	0.2 to 0.6	—
Drainage Class	Moderately well drained	—
Runoff	Very rapid	—
Max Erosion Hazard	Very high	—
Erosion Factor (k)		
Surface	0.05 (low)	—
Subsurface	0.10 (low)	—
T Value	1	—
Wind Erodability Group	8	—

191 - Yuko family - Rock outcrop (continued)

Soil Manageability Group	IV	IV
Class	4EGPXd	—

Range Interpretations

Productivity (lb/acre)	300 to 400	—
Suitability	Summer - Autumn	—
Most Limiting Factors	Plant competition: 40% shallow soils; 25% rock outcrop; very high erosion hazard; very steep slopes	—

Recreation Interpretations - Limitations for

Camp Areas	Severe: Slope	—
Picnic Areas	Severe: Slope	—
Paths & Trails	Severe: Slope	—

Engineering Interpretations

Unified Class		
Surface	SW-SM; SM-SC	—
Subsoil	SM	—
Substratum	—	—
AASHTO Class		
Surface	A-1-a; A-1-b; A-2-4	—
Subsoil	A-2-4	—
Substratum	—	—
Suitability for		
Sand	Unsuited	—
Gravel	Unsuited	—
Topsoil	Poor: Slope; area reclaim; small stones	—
Roadfill	Poor: Slope; area reclaim	—

Included Areas & Remarks

Included in this map unit are small area of a soil similar to the Slinger family, but warmer, and less than 20 inches to bedrock, on mountainsides; a soil similar to the Wrango family, but less than 20 inches to soft bedrock, 30 to 60 percent slopes, on pediment slopes; and a soil similar to the Brad family, but warmer, and with soft bedrock, on upper mountainsides. Included areas make up approximately 25 percent of the map unit area.

Table 2. - Acreage and Proportionate Extent of Map Units

Map Symbol	Map Unit Name	Percent of Survey Area	Acres
101	Abgese-Berent-Mackey families complex, 2 to 15 percent slopes	0.76	5,056
102	Abgese-Berent-Toeja families association, 2 to 30 percent slopes	0.66	4,405
103	Abgese-Berent-Toeja families association, 30 to 70 percent slopes	0.46	3,106
104	Basalt flow	0.02	129
105	Basket-Bondranch families complex, 15 to 30 percent slopes	1.50	10,060
106	Basket-Bondranch families-Rock outcrop, metasedimentary complex, 30 to 60 percent slopes	1.11	7,419
107	Basket-Bondranch families-Rock outcrop, metasedimentary association, 60 to 80 percent slopes	1.01	6,790
108	Basket-Bregar families complex, 15 to 30 percent slopes	0.85	5,671
109	Basket-Packham-Soakpak families association, 30 to 60 percent slopes	1.41	9,466
110	Bearskin-Toeja families complex, 30 to 60 percent slopes	0.62	4,138
111	Berent family, 5 to 15 percent slopes	0.37	2,492
112	Berent family-Rock outcrop, granitic complex, 5 to 30 percent slopes	0.15	1,003
113	Beveridge family-Rock outcrop, limestone complex, 60 to 80 percent slopes	0.64	4,269
114	Blackston family, 15 to 30 percent slopes	0.11	749
115	Bluewing-Trocken families association, 5 to 15 percent slopes	0.54	3,610
116	Brad family-Rock outcrop, granitic complex, 15 to 30 percent slopes	0.86	5,776
117	Bregar-Slinger families-Rock outcrop, metasedimentary complex, 30 to 60 percent slopes	2.80	18,734
118	Cinder Cones	0.10	645
119	Credo family, 15 to 30 percent slopes	0.09	631
120	Credo-Basket families complex, 30 to 60 percent slopes	0.70	4,703

Map Symbol	Map Unit Name	Percent of Survey Area	Acres
121	Finley family, 15 to 30 percent slopes	0.65	4,358
122	Finley–Moano–Mulett families complex, 5 to 40 percent slopes	0.26	1,740
123	Gol family–Durargidic Argixerolls complex, 2 to 15 percent slopes	0.19	1,261
124	Hartig–Dunul families–Rock outcrop, granitic association, 50 to 70 percent slopes	5.44	36,402
125	Hartig family–Rock outcrop, granitic complex, 30 to 60 percent slopes	1.50	10,059
126	Hartig–Packham families association, 30 to 60 percent slopes	1.32	8,859
127	Hymas family–Rock outcrop, limestone association, 15 to 30 percent slopes	0.80	5,366
128	Hymas family–Rock outcrop, limestone association, 30 to 60 percent slopes	2.56	17,140
129	Lithic Camborthids–Rock outcrop, sedimentary association, 2 to 15 percent slopes	0.05	309
130	Lithic Camborthids–Rock outcrop, sedimentary association, 15 to 30 percent slopes	0.07	487
131	Lithic Camborthids–Rock outcrop, sedimentary association, 30 to 60 percent slopes	0.89	5,966
132	Mackey–Unionville families complex, 3 to 15 percent slopes	0.87	5,802
133	Mackey–Washoe families complex, 3 to 15 percent slopes	0.07	482
134	Mascamp–Sumine families complex, 15 to 40 percent slopes	0.27	1,818
135	Mascamp–Sumine families complex, 40 to 60 percent slopes	0.09	619
136	Mascamp–Sumine families–Rock outcrop, metasedimentary complex, 30 to 60 percent slopes	1.28	8,573
137	Merlin–Wenzel families–Rock outcrop, volcanic association, 5 to 60 percent slopes	1.53	10,236
138	Mexispring family–Rock outcrop, granitic association, 15 to 30 percent slopes	0.70	4,711
139	Mexispring family–Rock outcrop, granitic association, 30 to 60 percent slopes	1.42	9,494

Map Symbol	Map Unit Name	Percent of Survey Area	Acres
140	Mexispring family–Rock outcrop, granitic association, 60 to 80 percent slopes	0.66	4,445
141	Midas–Cath–Mackey families complex, 4 to 15 percent slopes	0.99	6,603
142	Midas–Cath–Mackey families complex, 15 to 30 percent slopes	0.35	2,322
143	Moano family–Rock outcrop, sedimentary complex, 60 to 80 percent slopes	0.99	6,638
144	Mulett–Checkett families–Rock outcrop, granitic complex, 60 to 80 percent slopes	0.70	4,703
145	Mulett–Toeja families–Rubbleland association, 15 to 80 percent slopes	0.42	2,804
146	Packham–Slinger families–Rock outcrop, granitic association, 30 to 60 percent slopes	4.31	28,834
147	Packham–Spaa families–Rock outcrop, granitic association, 30 to 60 percent slopes	2.03	13,597
148	Pergelic Cryoborolls–Rock outcrop, metasedimentary association 30 to 60 percent slopes	0.92	6,173
149	Pergelic Cryoborolls–Rubbleland, metasedimentary complex, 30 to 60 percent slopes	0.29	1,947
150	Pergelic Cryoborolls–Soakpak family association, 5 to 70 percent slopes	5.07	33,907
151	Preston family, 1 to 15 percent slopes	0.45	3,005
152	Risue–Abgese–Preston families association, 2 to 15 percent slopes	1.91	12,787
153	Risue–Berent families association, 2 to 15 percent slopes	0.74	4,976
154	Rock outcrop–Rubbleland complex	2.69	17,989
155	Rock outcrop, limestone–Hymas family association, 60 to 80 percent slopes	1.33	8,895
156	Rock outcrop, granitic–Brad–Hartig families complex, 30 to 60 percent slopes	1.44	9,629
157	Rock outcrop, granitic–Brad–Hartig families complex, 60 to 80 percent slopes	1.78	11,940

Map Symbol	Map Unit Name	Percent of Survey Area	Acres
158	Rock outcrop, granitic-Packham family-Rubbleland association, 30 to 80 percent slopes	5.41	36,193
159	Sanpete-Theriot families complex, 5 to 60 percent slopes	4.47	29,890
160	Sanpete-Theriot families-Rock outcrop, limestone association, 60 to 80 percent slopes	1.11	7,410
161	Simpson-Hartig-Bregar families association, 30 to 60 percent slopes	0.04	239
162	Spanel-Trocken families complex, 2 to 15 percent slopes	1.03	6,881
163	Spanel-Trocken families complex, 15 to 30 percent slopes	0.47	3,141
164	Spanel-Trocken families complex, 30 to 60 percent slopes	0.74	4,976
165	St. Marys-Bearskin families-Rock outcrop, volcanic association, 15 to 60 percent slopes	0.65	4,371
166	Supervisor-Bartine families association, 30 to 70 percent slopes	2.05	13,736
167	Supervisor family-Rock outcrop, limestone-Bartine family association, 15 to 60 percent slopes	0.58	3,901
168	Supervisor family-Rock outcrop, granitic-Pergelic Cryoborolls association, 60 to 80 percent slopes	0.77	5,119
169	Supervisor family-Rock outcrop, metasedimentary complex, 5 to 30 percent slopes	0.41	2,767
170	Supervisor family-Rock outcrop, metasedimentary complex, 30 to 60 percent slopes	0.88	5,903
171	Swift Creek family-Rock outcrop, limestone complex, 15 to 30 percent slopes	0.19	1,295
172	Theriot family-Rock outcrop, limestone association, 15 to 30 percent slopes	0.20	1,362
173	Theriot family-Rock outcrop, limestone association, 30 to 60 percent slopes	0.87	5,821
174	Theriot family-Rock outcrop, limestone association, 60 to 80 percent slopes	1.37	9,193

Map Symbol	Map Unit Name	Percent of Survey Area	Acres
175	Toeja-Berning-Simpson families association, 15 to 60 percent slopes	1.37	9,155
176	Toeja-Merlin families complex, 30 to 60 percent slopes	0.05	302
177	Toeja-Merlin families-Rock outcrop, volcanic complex, 5 to 40 percent slopes	0.84	5,633
178	Trocken-Bluewing families complex, 15 to 30 percent slopes	0.17	1,138
179	Trocken family-Rock outcrop, metasedimentary complex, 60 to 80 percent slopes	1.55	10,362
180	Trocken-Midas families association, 5 to 60 percent slopes	0.56	3,720
181	Tweedy-Abgese families association, 1 to 15 percent slopes	1.07	7,117
182	Typic Haplargids-Vipont-Spaa families complex, 5 to 70 percent slopes	1.00	6,691
183	Typic Xerorthents, 2 to 15 percent slopes	0.47	3,148
184	Unionville-Risue families-Rock outcrop, volcanic complex, 5 to 30 percent slopes	1.31	8,771
185	Washoe-Checkett-Mulett families association, 30 to 60 percent slopes	4.68	31,338
186	Washoe family-Typic Haplargids association, 30 to 60 percent slopes	0.50	3,357
187	Wrango family, 5 to 15 percent slopes	0.59	3,953
188	Wrango-Mackey families complex, 3 to 15 percent slopes	0.46	3,049
189	Yuko family-Rock outcrop, granitic association, 15 to 30 percent slopes	0.50	3,369
190	Yuko family-Rock outcrop, granitic association, 30 to 60 percent slopes	1.35	9,035
191	Yuko family-Rock outcrop, granitic association, 60 to 80 percent slopes	0.50	3,351
	TOTALS	100.00	669,420