

CHAPTER 8

SOIL RESOURCES

8.1 INTRODUCTION

A survey was conducted to determine the soil resources of the North Area and Areas II, III, IV North, and adjacent Environmental Quality locations of the Navajo Mine. The objective was to assess the salvageable topdressing material for each area. The topdressing material is used in reclamation of disturbed land resulting from the coal surface mine operation at Navajo Mine. A total area of 11,733 acres was surveyed.

In 1985, a soil resources survey was completed for the North Area and Areas II, III and part of IV North. A total of 983 soil profiles were described to develop a soil map of the four areas. The completed survey area was 7,356 acres. In 1988, a similar survey was completed for Area IV North and 11 EQ locations. A total of 843 soil profiles were described and the survey area was 3,547 acres. In 1989, a soil resources survey was completed for a part of Area II, referred to as "Block B", which is located near Yazzie Lookout and extends south to the Area III complex. A total of 149 soil profiles were described and the survey area was 830 acres. A total of 28 soil series, 2 series variants and one miscellaneous land type were used to name 26 mapping units. This survey is similar to an order 2 in terms of field techniques but is presented at a scale of 1:6000 having minimum size delineations of 0.5 acre.

In 1991 a soil resources survey was completed for 124 acres in Area II referred to as "Block C" which is located north of the Updip Barber reclamation area. This survey was conducted using air photo interpretation supported by field observation of the geomorphic surfaces. These survey procedures were employed while an archaeological review of the area was being conducted. Once the archeological review was complete an intensive survey for available topdressing was conducted in 1997. The combination of these two surveys was used to establish the baseline soil resources in Block C. A detailed explanation of survey procedures used in Block C is provided in Section 8.3.1 "Soil Survey Procedures Block C".

This survey should be used as a planning tool and not for precise unit delineations. The estimates given for the kinds of soil, amount of topdressing, soil depth, and extent of mapping units may vary in some areas by 20 percent.

8.2 GENERAL NATURE OF THE SURVEY AREA

The soil survey area is located within the Colorado Plateau physiographic province (Fenneman, 1983; Hunt, 1956; Thornbury, 1964). The Colorado Plateau has within its borders a wide diversity of topography, geologic materials, soils and vegetation. The general terrain in the vicinity of the Navajo Mine is characterized by rough and broken topography, badlands, plateaus and mesas, intermingled with escarpments and valleys or washes. Many of the soils in the survey area are formed from alluvium and eolian sediments derived from shale and sandstone. Some soils have a residual component. Most of the soils in the survey area have been forming only since the late-Pleistocene and during the Holocene Era. It is very common to find buried soils that date back to the Pleistocene Era. Climatic information for Navajo Mine can be found in CHAPTER 4.

A soil survey of the area was issued in November 1980 as the Soil Survey of San Juan County New Mexico, Eastern Part (USDA, 1980). The soil survey is an order 3 presented at scales of 1:24000 and 1:63360. Copies of the survey are available from the state Soil Conservation Service (SCS) Office in Albuquerque or from the local office in Aztec. Many of the soil series names used in this report are the same as those used in the 1980 soil survey. Additional names of series are used from the Shiprock Survey, SCS, 1987.

8.3

SOIL SURVEY PROCEDURES

The field work for this survey was conducted during July and August of 1984, 1985, 1987 and 1989. Transects were distributed in each survey area to provide a pattern for the location of soil pits. The transects were located so that the soil pits could be positioned in each of the major soil types that had been previously identified on aerial photos. The aerial photos were taken April 5, 1985 at a scale of 1:6000 (1" = 500') Soil pits were positioned along the transects in a regular pattern. The spacing of the pits was determined by the complex nature of the soil in an area. They were generally positioned 200 to 500 feet apart along a transect. Complex areas were described with a close spacing and homogenous areas were described with a wide spacing. The distance between transects was also determined by the nature of the area. Transects were generally 500 to 1000 feet apart.

Soil pits were dug with the aid of a backhoe. The pits were dug to a depth of 60 inches or more unless bedrock was encountered. The exposed soil profiles were described with respect to soil type (series) and depth of suitable topdressing material. Soil samples were collected from selected soil profiles that represented either extensive soil components, soils that could not be classified in the field or the topdressing suitability could not be easily determined. The analysis of these samples included physical and chemical characteristics (see laboratory data with the soil series descriptions). These analyses helped determined suitability of topdressing material and classification of the soil. A total of 217 soil profiles were selected for sampling. A total of 794 soils samples (horizons) were analyzed. In some cases only one or two horizons were sampled in a soil profile. The methods used for each soil analysis are identified in APPENDIX 8-A.

The location of each soil profile was plotted on the aerial photos and then transferred to the orthophoto soil maps. Each profile location is numbered consecutively within an Area (I-IV) or EQ location. That is, each different area in the survey starts with a profile numbered 1. Once the survey for a group of transects was completed, the map unit delineations were plotted on the aerial photos. An attempt was made to place one or more soil profiles in every major map delineation of the map units. A total of 1,826 profiles were exposed. A list of samples sites and soil series appear in APPENDICES 8-B and 8-C, respectively. When a mapping unit was identified as not being sampled along an existing transect, then an additional transect and soil profile(s) were located to describe that map unit. When necessary, additional transects were located to ensure that each major soil delineation had at least one profile description. Many delineations had 2 to 5 profiles and some had more than 20 if they were of an area greater than 100 acres. The Badlands areas were visited but no profiles were described or sampled. These are relatively easy areas to identify on aerial photos and are not sources of topdressing material based on previous surveys of the San Juan Basin.

After the transect survey was completed, map unit delineations were transferred to orthophotos which serve as the base map for presenting the soil resource map. These maps are presented at a scale of 1:6000. The map delineations are named on the basis of components that exist within them. The naming is a process of grouping delineations that are similar. The name comes from the one or two dominant components. In most cases, consociations could be established. A total of 26 mapping units were named from the 28 soil series, 2 series variants and 1 miscellaneous land type (badlands).

Twenty of the 26 map units were consociations, four were complexes and two were undifferentiated units. One of the map units is a consociation of Natrargids. The map unit consists of six soil series (all Natrargids) that differ primarily in either depth to bedrock or texture. These soils are sodium affected and do not represent suitable sources of topdressing. However, Natrargids that have a sandy eolian surface deposit are a source of suitable topdressing. These soils were designated as an overblown phase to represent sources of topdressing. The map components used to name the map units were phases of soil series, using surface texture, depth of suitable topdressing, and slope as phase criteria. Two series variants were used as soil components. A variant has properties sufficiently different from the named soil series to suggest the establishment of a new series. The variant, however, is of such limited known extent that creation of a new series is not justified.

Undifferentiated map units were mainly used when the components had similar topdressing suitability and there was no advantage in determining component composition. Consociations were used when possible to better approximate the homogenous units and better approximate the depth of suitable topdressing material. Complexes were used if the soils had a regular pattern of distribution.

Topdressing availability is calculated as a volume estimated from the average depth of suitable material over the area of that mapping unit. These calculations are (Depth x Area) and can be found for each individual map delineation.

8.3.1 Soil Survey Procedures Block "C"

In 1991 the area known as Block C was surveyed, this area is located in Area II north of the Updip Barber reclamation area. This 124-acre area was surveyed using air photo interpretation supported by field observation of the geomorphic surfaces. The survey area could not be disturbed at this time because it lacked archeological clearance. Therefore, the soils in this area were not excavated for either profile descriptions or sampling.

In 1997 after receiving archeological clearance, Block C was intensively surveyed for available topdressing resources. Following are the survey methods used: Topdressing survey sites were located on 200 foot intervals along transect lines spaced 200 feet apart. Survey sites were not positioned within the boundaries of an archaeological site located in the central part of the survey area. Each site was then surveyed for its northing, easting, and elevation.

At each site a Giddings Soil Probe was used to take a continuous core sample from the soil surface down to a paralithic or lithic contact. The core sample was separated by major soil horizons, a brief soil profile description was written and soil samples were collected from the major soil horizons. To check the accuracy of the core soil profile descriptions, five sites were randomly selected and a backhoe pit was excavated at each site to verify the thickness of major soil horizons and depth to bedrock.

Information from both the 1991 and 1997 surveys were compiled to provide the baseline soil information. Block C contains five soil mapping units; all have been characterized in previous areas. Approximately two thirds of Block C is Badlands, with the remaining area contributing approximately 145,000 cubic yards of topdressing resource. The availability of topdressing by Mine Area and sample location is provided in Appendix 8-D and 8-E. Information for Block C is not reported in Appendix 8-B and 8-C as surface texture and percent slope information was not collect at each site.

8.4 GENERAL SOILS MAP

The general soil map, EXHIBIT 8-1, shows the broad pattern of soils suitable for topdressing material. The small scale does not show soil types for specific sites but is provided to give a perspective of the availability of topdressing material for the Navajo Mine. The general soils map was constructed from the detailed soil maps. The 26 mapping units were combined to represent the following three general map units.

8.4.1 Badlands

This is a miscellaneous land type consisting of barren shale uplands that are deeply dissected by intermittent drainage ways and gullies. Slopes range from nearly level to 80.0 percent. This unit is not a source of topdressing material. Approximately 33 percent of the mapping area is in the Badlands mapping unit.

8.4.2 Natrargids

The soils of this map unit have limited use as a source of topdressing material. The unit consists of approximately 35 percent of the area and is found scattered throughout the survey area. It is often associated with the Badlands unit. The soils are usually fine or fine-loamy and have well developed natric horizons. They are formed from shale bedrock or deep to moderately deep alluvium. In some areas, eolian sands have accumulated on the soil surface and this sandy material can be used as topdressing material.

8.4.3 Topdressing Source

The soils of this map unit occupy approximately 32 percent of the survey area. The soils range from shallow to deep and occur mostly on stable uplands or alluvial fans, terraces, and drainage ways. This unit is the main source of topdressing material to be used in disturbed land reclamation. In some areas suitable material extends to over 80 inches in depth, and in other areas less than 6 inches. Depth of suitable material in this map unit can be restricted by bedrock, calcic layers, very hard consistencies or accumulations of sodium salts.

8.5 **DETAILED SOILS MAP**

The extent and proportion of each map unit is given in TABLE 8-1. These map units are shown on the detailed soil maps (scale 1:6000) labeled EXHIBITS 8-2 through 8-14. They represent the specific kinds of soil in the survey area. The extent and composition of each map unit delineation are given in APPENDICES 8-D and 8-E. Descriptions of each map unit follow.

8.5.1 Soil Resources

The map unit descriptions in this section give the approximate distribution of the various soil components in each map unit. The landform composition, depth of topdressing, and extent of each unit is also presented. The specific descriptions of the soil components (soil series) are given in APPENDIX 8-F, Soil Series Descriptions, which also includes the laboratory data for the individual soils.

TABLE 8-1
EXTENT AND PROPORTION OF EACH MAPPING UNIT IN THE
TOTAL SURVEY AREA.

Soil Mapping Units	Acres	Percent of Area
Ba Badland	4165.0	35.55
Bb Bacobi and Monierco soils	816.1	6.97
Bc Blancot	68.9	0.58
Bh Blancot, very hard	91.9	0.78
Fa Farb and Persayo Soils	421.9	3.60
Gr Grieta	35.8	0.30
Jc Jocity - Gilco	359.0	3.06
Jh Jocity, very hard	233.7	1.99
Ma Mack	175.1	1.49
Mn Mayqueen	49.7	0.42
Ms Mayqueen-Shiprock	256.5	2.19
Mv Mayqueen-Shiprock, very hard	32.4	0.27
Na Nakai	27.4	0.23
Nt Natrargids	3579.7	30.55
Nv Natrargids, overblown	318.4	2.71
Ra Razito	234.6	2.00
Rh Razito, very hard	89.4	0.76
RI Redlands Variant	155.7	1.33
Rv Redlands Variant, very hard	59.3	0.50
Sc Shiprock	254.0	2.16
Sh Shiprock, very hard	90.8	0.78
Sl Shiprock-Blancot	30.7	0.26
Sv Shiprock Variant	78.9	0.67
Sz Stumble	12.7	0.10
Ta Trail	35.0	0.30
Th Trail, very hard	<u>40.7</u>	0.34
Total	11713.3	

Each map unit of the soil maps (EXHIBITS 8-1 through 8-14) represents an area on the landscape and consists of one or more soils for which the unit is named. A symbol is used to identify each map unit name. The area (acres) and the depth (inches) of suitable topdressing is given for each map unit delineation.

The components of each map unit are phases of soil series. The soils of a series have major horizons that are similar in composition thickness and arrangement. Some soil series have been phased because of restrictions in the depth of soil material suitable for topdressing. For example, the very hard phased soils closely resemble the named series except that they typically have very hard or extremely hard, dry consistency. The consistence phase is a restriction of topdressing availability. Soil series are phased to differentiate similar soils within a series. Phases are used to indicate a feature that will affect the use or management of the soil. Criteria may be surface texture, slope or depth.

8.5.2 Map Unit Descriptions

Ba - Badlands. This map unit consists of barren shale uplands that are dissected by deep intermittent drainage ways and gullies. Also included are very steep to nearly vertical rock outcrops of sandstone and shale. The slope is zero to eight percent. This unit has no usable topdressing material and occupies 4,165 acres or 35.5 percent of the survey area.

Bb - Bacobi and Monierco soils, zero to eight percent slopes. This is an undifferentiated map unit of Bacobi and Monierco loamy sands, sandy loams, and sandy clay loams. These soils have formed in alluvial and eolian material derived predominantly from sandstone and shale on mesas and plateaus. Bacobi soils occupy 30-50 percent of most delineations and Monierco soils 35-55 percent. The major inclusions (two-five percent) are Avalon, Farb and Shiprock soils. The minor inclusions (less than one percent) are Fajada, Fruitland, Nakai and Wingrock soils. Bacobi (20-40 inches to bedrock) and Monierco (<20 inches to bedrock) soils provide from 5 to 25 inches of topdressing material. This unit occupies 819 acres or seven percent of the survey area.

Bc - Blancot sandy clay loam, zero to five percent slopes. This map unit is on fans, valleys, terraces and mesas. Soils have formed in alluvium derived predominantly from sandstone and shale. This unit is 85-90 percent Blancot sandy clay loam and Blancot sandy loam. Blancot soils are on fans and in upland valleys, and occur with inclusions on terraces and mesas. Included in this unit are areas of Doak sandy loam (five percent) and small areas of Shiprock, Shiprock Variant, Redlands Variant and deep Natrargids. These additional included areas make up less than 15 percent of the total acreage. The Blancot soils in this unit are deep and provide from 40 to 80 inches of topdressing material. This unit occupies 69 acres or 0.6 percent of the survey area.

Bh - Blancot sandy clay loam, very hard, zero to two percent slopes. Soils have formed in alluvium derived predominantly from sandstone and shale. This unit is 80 percent Blancot sandy clay loam, very hard. These Blancot soils are on fans and in valleys and occur with inclusions on terraces and some valleys. Included in this unit are small areas of Blancot sandy clay loams and sandy loams. Other included soils are Doak (15 percent), Shiprock (five percent) and deep Natrargids. Included areas make up about 20-25 percent of the total acreage. The Blancot soils in this unit have 40 inches of available topdressing because the lower horizons are very hard to extremely hard. These lower horizons generally have SAR values of 15 or higher. The cementation of these horizons is associated with sodium dispersed clay and, when dry, will restrict root growth. This unit occupies 92 acres or 0.8 percent of the survey area.

Fa - Farb and Persayo soils, zero to eight percent slopes. This map unit is primarily found on mesa tops where the soils are shallow. These soils are derived from sandstone or sandstone interbedded with shale. Farb soils occupy 60 percent and Persayo soils occupy about 10 percent of the delineation. The major inclusions include Tsaya, Wingrock, Huerfano, Monierco and Patel soils (<5 percent each). The depth of topdressing ranges from 0 to 12 inches. This unit occupies 417 acres or 3.6 percent of the survey area.

Gr - Grieta sandy Loam, zero to five percent slopes. This map unit is found on older stable landscapes where the soils have a well developed calcic layer. Soils have developed from alluvium derived from sandstone and shale. Grieta soils occupy 95 percent of the unit. Inclusions are soils from associated map units, Bacobi, Mack, Monierco and Nakai. The depth of suitable topdressing ranges from 15 to 35 inches. This unit occupies 36 acres or 0.3 percent of the survey area.

Jc - Jocity-Gilco complex, zero to three percent slopes. This unit is found as deep alluvial deposits on flood plains. The soils range in texture from sandy to clay loam and are formed from recent alluvium along drainages. These are some of the youngest soils in the survey area. Jocity and Gilco soils each occupy from 35-55 percent of the map unit. Jocity soils average more than 18 percent clay in the control section and Gilco averages less than 18 percent clay. Included soils consist mainly of Fruitland, Stumble, Trail and Tewa, each generally averaging less than two percent of a delineation. When the soils are not sodium affected, they provide a desirable source of topdressing. The depth of topdressing ranges from 36 to 60 inches for these soils. This unit occupies 359 acres or 3.1 percent of the survey area.

Jh - Jocity, very hard, zero to three percent slopes. This unit is found as deep alluvial deposits on stream terraces and flood plains. These soils are similar to those of the Jocity-Gilco complex except they are sodium affected and the deposits have a consistence of very hard to extremely hard when dry. The Jocity soils occupy 60-80 percent of the map unit. The included soils are Gilco (<15 percent) and deep Natrargids (Benally and Hoskey). The available topdressing from this unit is limited and ranges from 0 to 16 inches of suitable material. The map unit occupies a total of 234 acres or two percent of the survey area.

Ma - Mack sandy loam, zero to three percent slopes. This unit is located on stable mesas as a deep soil having well developed calcic horizons formed in alluvium derived from sandstone and shale. The substratum is gravelly, which distinguishes these soils from Grieta soils. This unit is over 80 percent Mack soils having sandy loam and loamy sand surfaces. The included soils are Redlands Variant (<15 percent) and Shiprock Variant (<5 percent). The depth of suitable topdressing ranges from 40-80 inches. The unit occupies 175 acres or 1.5 percent of the survey area.

Ma - Mayqueen loamy sands, zero to eight percent slopes. This map unit is primarily formed from stabilized eolian material derived from sandstone and shale. The Mayqueen soils occupy over 90 percent of the unit. The major included soils are Razito and Shiprock, approximately five percent each. The depth of suitable topdressing ranges from 21 to 70 inches. This unit occupies 50 acres or 0.4 percent of the survey area.

Ms - Mayqueen-Shiprock loamy sands, zero to eight percent slopes. This map unit is on mesas and plateaus and consists of deep soils well suited for topdressing material. This unit is nearly 50 percent Mayqueen and 40 percent Shiprock. The major included soils are Razito (<3 percent) with lesser amounts of Bacobi, Blancot, Doak, Redlands Variant, Shiprock Variant and Stumble. The depth of available topdressing ranges from 22 to 74 inches. This unit occurs on 260 acres or 2.2 percent of the survey area.

Mv - Mayqueen-Shiprock loamy sands, very hard, zero to eight percent slopes. This map unit is on mesas and plateaus. The soils consist of soils very similar to the Mayqueen-Shiprock complex except they are sodium affected and the dry consistence of the subsurface is very hard or extremely hard. The Mayqueen very hard soils occupy more than 15 percent of the map unit. Inclusions are few and mostly consist of soils from associated map units, Mayqueen, Shiprock and Shiprock Variant. The depth of suitable topdressing is limited by the dry consistence of the subsurface and averages 20 inches. This unit occupies 32 acres or 0.3 percent of the survey area.

Na - Nakai sandy loam, zero to five percent slopes. This unit occurs on stable terraces and alluvial fans. These soils are derived from eolian and alluvial material derived from sandstone and shale. The Nakai soils occupy over 90 percent of the map unit. Included are soils from associated map units, which are primarily Avalon, Shiprock Variant and Wingrock. The depth of suitable topdressing ranges from 10 to 21 inches. This unit occupies 27 acres or 0.2 percent of the survey area.

Nt - Natrargids, zero to eight percent slopes. This is a unit of six soils that are shallow, moderately deep, and deep Natrargids. Soils occur on mesas and in valleys. They are derived from alluvium or directly from shale. In most delineations, they lack vegetation except for sparsely distributed salt tolerant grasses, forbs and shrubs. The components of this unit are so intricately intermingled that it would have been time consuming to map them separately. Since none of the components constitute a source of topdressing, they were combined to form an undifferentiated map unit. The Natrargids in the map unit are: Huerfano shallow (42 percent), Fajada moderately deep (four percent), Patel moderately deep (four percent), Benally deep (six percent), Uffens deep (24 percent) and Hoskey deep (four percent). The common inclusions are Blancot very

hard, Chipeta, Farb, Jocity very hard, and Trail. The soils are not suitable as sources of topdressing material. This map unit occupies 3,580 acres or 31 percent of the total survey area.

Nv - Natrargids overblown, zero to eight percent slopes. This map unit is similar to the Natrargids map unit except the surface textures of these soils are sands and loamy sands that originate from recently deposited eolian material. In most cases the eolian sands are less than 20 inches deep. When the eolian sands covering the Natrargids soils were greater than 20 inches deep, the soils were mapped as Razito, very hard soils. The Natrargids of this unit include Fajada (27 percent), Uffens (22 percent), Benally (19 percent), Huerfano (10 percent) and Patel (three percent). Inclusions are Razito very hard (12 percent) and Trail, Blancot, Doak and Shiprock soils (all less than 1 percent). Soils of this unit do provide a source of topdressing that ranges from 0 to 20 inches of material. This map unit occupies 318 acres or 2.7 percent of the total survey area.

Ra - Razito sands-loamy sands, zero to eight percent slopes. This unit consists of deep soils on mesas and plateaus formed in eolian sands. The soils occur as dunes that are young and lack soil development. The Razito soils occupy over 70 percent of the unit. The major inclusion is Mayqueen soils occupying nearly 25 percent of the unit. These soils are similarly managed as Razito soils. Other inclusions are Blancot, Shiprock and Stumble soils. Although the textures are sands and loamy sands for Razito soils, the available topdressing material ranges from 40 to 80 inches. This unit occupies 234 acres or two percent of the survey area.

Rh - Razito sands-loamy sands, very hard, zero to eight percent slopes. This unit consists of soils that have formed from eolian sands similar to the Razito soils. These very hard soils have higher levels of sodium and have very hard to extremely hard consistence in the subsoils. The soils are derived from eolian sands and occur on mesas and plateaus. In some areas, the sands are deposited over bedrock or Natrargids that limit the available topdressing. Razito, very hard soils occupy nearly 80 percent of the unit. Major inclusions consist of Razito, Mayqueen, Patel and Stumble soils. The textures of these soils are sands and loamy sands. Because of the limitation in dry consistence, the available topdressing material ranges from 10 to 40 inches. This unit occupies 89 acres or 0.8 percent of the survey area.

Rl - Redlands Variant sandy loam, zero to four percent slopes. This map unit is on stable mesas and terraces. The soils are alluvial and formed from sandstone and shale. They are well developed and provide one of the best sources of topdressing material. Redlands variant soils occur in nearly 85 percent of the map unit and the major inclusions are Shiprock and Doak soils. This map unit was set up to describe soils that have more clay than Shiprock soils, less clay than Doak and Blancot soils, and lack a calcic horizon. The depth of available topdressing ranges from 30 to 69 inches and the unit occupies a total of 156 acres or 1.3 percent of the survey area.

Rv - Redlands Variant sandy loam, very hard, zero to three percent slopes. This map unit occurs on terraces and mesas. The soils are formed from alluvium derived from sandstone and shale. These soils are similar to the Redlands Variant except the subsoils are very hard and extremely hard and have high levels of sodium. This unit is over 70 percent Redlands Variant, very hard phase. The major inclusions are Redlands Variant, Doak, and Patel soils. The soils are deep and the surface texture is loamy sands, and sandy loams. Available topdressing material is limited to depths ranging from 10 to 20 inches. This map unit occupies 59 acres or 0.5 percent of the survey area.

Sc - Shiprock loamy sand-sandy loam, zero to eight percent slopes. The soils are formed in alluvium and eolian material derived from sandstone and shale. This map unit is on mesas and plateaus. The unit is over 80 percent Shiprock soils. Included in this map unit are Redlands Variant and Shiprock Variant soils with minor areas of Grieta, Mack and Mayqueen soils. These soils represent some of the most suitable sources of topdressing material. The depth of suitable topdressing ranges from 24 to 67 inches. This map unit occupies 254 acres or 2.2 percent of the survey area.

Sh - Shiprock loamy sand-sandy loam, very hard, zero to eight percent slopes. This map unit occurs on mesas and terraces as deep, well developed soils. The soils are similar to Shiprock soils but the subsoils are very hard or extremely hard. Typically, the sodium levels are higher than for Shiprock soils. Topdressing depth is limited by material that is either very hard or extremely hard. The map unit is about 70 percent Shiprock very hard soils with inclusions of Bacobi, Grieta, Mayqueen, Razito, Redlands Variant and Shiprock Variant soils. The depth of suitable topdressing ranges from 14 to 22 inches. This unit occupies 93 acres or 0.8 percent of the survey area.

S1 - Shiprock-Blancot complex, zero to eight percent slopes. This map unit is on fans, terraces and mesas. Soils have formed in alluvium derived predominantly from sandstone and shale. This unit is 45 percent Shiprock loamy sand and sandy loam. Shiprock soils occur on stable mesas and terraces whereas Blancot soils are associated with fans and stable terraces. Included in this unit are small areas of Doak, Mayqueen, Redlands Variant and Uffens soils. Included areas make up about 0.5 percent of the map unit. The Shiprock-Blancot soils are deep and provide 40 to 80 inches of available topdressing material. This unit occupies 30 acres or 0.3 percent of the survey area.

Sv - Shiprock Variant sandy loam, zero to five percent slopes. These soils are on mesas and plateaus. They have formed in calcareous alluvium derived from sandstone and shale. The soils are similar to Shiprock soils except for the presence of a calcic layer within 60 inches of the surface which limits the depth of topdressing available. The map unit is nearly 80 percent Shiprock Variant soils and the major inclusions are Bacobi, Grieta, Shiprock and Redlands Variant collectively occupying 30 percent of the unit. The depth of available topdressing ranges from 12 to 31 inches and the unit occupies 79 acres or 0.7 percent of the survey area.

Sz - Stumble sand-loamy sand, 0 to 12 percent slopes. This map unit occurs on sides of valleys and alluvial fans. Soils have formed in sandy alluvium derived from sandstone and shale. This unit is 50 percent Stumble sand and 30 percent Stumble loamy sand. Included are limited areas of Razito and steep Stumble soils. Although the soils are sandy they provide 40 to 60 inches of available topdressing material. This unit occupies 13 acres or 0.1 percent of the survey area.

Ta - Trail loamy sand-sandy loam, zero to eight percent slopes. These soils are on flood plains and low river terraces. They formed in sandy alluvium derived from sandstone and shale. Trail soils usually occur in higher positions in the landscape than the related Gilco soils. The map unit is over 80 percent Trail soils. Inclusions are Trail very hard, Gilco and, on steeper slopes, Razito soils. The depth of available topdressing ranges from 26 to 81 inches. This map unit occupies 35 acres or 0.3 percent of the survey area.

Th - Trail, very hard, zero to eight percent slopes. This unit is on eroded terraces which resemble the substratum of stable mesas or floodplains. Soils have formed from alluvium derived from sandstone and shale. The soils are sodium affected and are generally very hard or extremely hard throughout the profile. The unit is 80 percent Trail very hard soils with inclusions of Stumble, Razito, and various Natrargids. The depth of available topdressing ranges from 4 to 23 inches. The map unit occupies 41 acres or 0.3 percent of the survey area.

8.5.3 Topdressing Availability

The purpose of this soil survey was to determine the soil resources available as topdressing material for the reclamation of mined areas at the Navajo Mine. One objective was to map the soils at a large enough scale to produce mapping units of similar soil types. It is assumed that if similar soils can be mapped together, then characteristics of a few samples within the unit can be extrapolated for the entire unit. The assumption is valid for homogenous areas or areas where small delineations can be made to maintain homogenous components. The scale used in this survey allowed delineations of 0.5 acre. In areas of very heterogeneous soils, the delineations tend to be smaller and more samples are required to describe the soils than in homogenous areas where the delineations tend to be larger.

To determine the available topdressing, each map unit delineation was considered individually. First, the average depth of suitable material was determined from the soil sites examined within the unit. The criteria, TABLE 8-2, used to determine soil suitability, are adopted from the State of New Mexico guidelines.

The following changes to criteria identified in the New Mexico Overburden and Soils Inventory and Handling Guidelines have been made:

The criteria for the good and marginal classifications have been combined into the Suitable category.

TABLE 8-2

TOPSOIL SUITABILITY RATING GUIDE.

Characteristic	Suitable	Unsuitable
1. pH (saturated paste)	5.5-8.8	<5.5 >8.8
2. EC (mmhos/cm)	0-12	>12
3. SAR	sandy loam & coarser 0-18	>18
	loams & clay loams 0-16	>16
	>40% clay 0-14	>14
4. Texture	0-45% clay	>45% clay
5. CaCO ₃ (%)	0-15	>15
6. Rock Fragments (%) 0.2cm - 25cm (0.8in - 10in)	0-35 non-skeletal	>35 skeletal
greater than 25cm (greater than 10")		>0

TABLE 8-2 (cont'd)

Characteristic	Suitable	Unsuitable
7. Dry consistence	loose, soft, slightly hard, hard	very hard extremely hard
8. Bedrock		lithic & paralithic (R & Cr horizons)

This guidesheet has been adapted from the New Mexico Overburden and Soils Inventory and Handling Guidelines, as revised March, 1987. Differences are explained in Section 8.5.3 "Topdressing Availability".

Calcium Carbonate criteria has been modified. The value of 30 percent for unsuitability has been lowered to 15 percent. It has been experienced that material having 15 percent or more CaCO_3 equivalent is unsuitable topdressing because of cementation and crusting.

Rock fragment criteria has been modified. Skeletal material (>35 percent rock fragments) has insufficient fine earth for reclamation. Material with rock fragments larger than 25 cm cannot be cultivated with the equipment used at the Navajo Mine.

Dry consistence has been added as a criterion. Experience has shown that soil material having a dry consistence of very hard or extremely hard is unsuitable for topdressing. These materials generally have elevated sodium contents causing severe crusting when placed on the surface of reclamation plots. It has also been noted that native plants do not naturally establish in undisturbed areas where these materials are exposed to the surface.

Bedrock has been added as a criterion. Lithic (hard bedrock) and paralithic (soft bedrock) material are unsuitable as sources of topdressing. They lack sufficient amounts of fine earth for reclamation.

Boron and Selenium have been deleted as criteria. Personnel at BHP Minerals (BHP) have experienced that toxic levels of these two elements do not exist in soils common to the Navajo Mine that are otherwise considered suitable topdressing material.

Saturation percentage has been deleted as a criterion. Saturation is considered redundant as it can be estimated from soil texture.

After the depth of suitable material was determined, the topdressing volume was calculated by multiplying the depth by the area within individual mapping delineations and expressing the volume amount as cubic yards. The total amount of available topdressing for each area is presented in TABLE 8-3. The values for each mapping unit delineation by area are presented in APPENDIX 8-D, TABLES 8-D-1 through 8-D-13. In APPENDIX 8-E, TABLES 8-E-1 through 8-E-26, a list of map delineations for each map unit type is given.

TABLE 8-3

AVAILABLE AND SALVAGEABLE TOPDRESSING IN EACH SURVEY AREA.

Area	Soil Survey Acres	^{1/} Depth of Topdressing Inches	Available Topdressing Cubic Yards	^{2/} Salvageable Topdressing Cubic Yards
I	831.4	20.9	2599722	2339750
II	619.4	11.0	1019585	917626
II (Block B)	830.0	7.6	943747	849372
III	2827.8	17.0	7201686	6481517
IV NORTH	5816.0	5.6	4871123	4384011
EQ-5/6	34.0	3.8	19257	17331
EQ-7/8	39.1	57.1	333469	300122

TABLE 8-3 (cont'd)

Area	Soil Survey Acres	^{1/} Depth of Topdressing Inches	Available Topdressing Cubic Yards	^{2/} Salvageable Topdressing Cubic Yards
EQ-11/12	46.0	18.4	126630	113967
EQ-13	61.1	5.9	54326	48893
EQ-15	200.1	23.1	690937	621843
EQ-25	90.8	23.2	314828	283345

^{1/} Depth of topdressing values are the average depth of topdressing material that could be evenly distributed over the reclamation plots assuming the entire area is to be reclaimed.

^{2/} Salvageable topdressing values are reduced 10 percent because of an experienced handling loss.

8.6 CLASSIFICATION OF THE SOILS

The soils used in the survey area are included within the soil orders Aridisol and Entisol, as defined by the SCS of the United States Department of Agriculture (Soil Survey Staff, 1975). The classification of the soils of the Navajo Mine survey area is shown below:

Series	Taxonomic Classification of Soils
Avalon	Fine-loamy, mixed, mesic Typic Camborthid
Bacobi	Fine-loamy, mixed, mesic Typic Haplargid
Benally	Fine-loamy, mixed, mesic Typic Natrargid
Blancot	Fine-loamy, mixed, mesic Typic Haplargid
Chipeta	Clayey, mixed (calcareous), mesic, shallow Typic Torriorthent
Doak	Fine-loamy, mixed, mesic Typic Haplargid
Fajada	Fine-loamy, mixed, mesic Typic Natrargid
Farb	Loamy, mixed (calcareous), mesic Lithic Torriorthent
Fruitland	Coarse-loamy, mixed (calcareous), mesic Typic Torriorthent
Gilco	Coarse-loamy, mixed (calcareous), mesic Typic Torrifluvent
Grieta	Fine-loamy, mixed mesic Typic Haplargid
Hoskey	Fine, mixed, mesic Typic Natrargid
Huerfano	Loamy, mixed, mesic, shallow Typic Natrargid
Jocity	Fine-loamy, mixed, mesic Typic Haplargid
Mayqueen	Coarse-loamy, mixed, mesic Typic Haplargid
Monierco	Loamy, mixed, mesic, shallow Typic Haplargid

Nakai	Coarse-loamy, mixed, mesic Typic Calciorthid
Patel	Fine, mixed, mesic Typic Natrargid
Persayo	Loamy, mixed (calcareous), mesic, shallow Typic Torriorthent
Razito	Mixed, mesic Typic Torripsamment
Redlands	
Variant	Fine-loamy, mixed, mesic Typic Haplargid
Shiprock	Coarse-loamy, mixed, mesic Typic Haplargid
Shiprock	
Variant	Coarse-loamy, mixed, mesic Typic Haplargid
Stumble	Mixed, mesic Typic Torripsamment
Trail	Sandy, mixed, mesic Typic Torrifluvent
Tsaya	Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthent
Uffens	Fine-loamy, mixed, mesic Typic Natrargid
Wingrock	Coarse-loamy, mixed, mesic Typic Camborthid

8.7 KEY TO SOILS

Diagnostic Subsurface Horizon Lacking

Entisol

1. <35% rock fragments,
loamy fine sand or coarser to a
depth of 1m or a lithic or
paralithic contact
2. deeper than 25cm, slopes <25%,
and irregular decrease in organic-
carbon content
3. other soils

Psamments

Fluvents

Orthents

Psamments:

Deep (contact > 50cm to lithic or paralithic)
Eolian or Alluvium,
color 7.5 YR or 10 YR without Bk Razito
Eolian or Alluvium,
color 7.5 YR or 10 YR with Bk Stumble

Fluvents:

Deep (contact > 50cm to lithic or paralithic)
Sandy (Coarser than LFS) Trail
Fine-loamy
(18%-35% clay) Jocity
Coarse-loamy
(<18% clay but non-sandy) Gilco

Orthents:

Lithic or paralithic (contact < 50cm to bedrock)
Loamy-skeletal
(>35% rock fragments) Tsaya
Loamy
(5%-18% clay) Farb
Loamy
(18%-35% clay) Persayo
Clayey
(>35% clay) Chipeta

Deep (contact > 50cm to lithic or paralithic)
Coarse-loamy
(5%-18% clay) Fruitland

Diagnostic Subsurface Horizon Present

Aridisols

1. Argillic or natric horizon
2. Other soils (cambic or calcic)

Argids

Orthids

Argids:

Natric horizon

(SAR > 13 within 40cm)

Natrargids

Argillic horizon

(SAR < 13 within 40cm)

Haplargids

Natrargids:

Paralithic contact < 50cm

Huerfano

Paralithic contact from 50-100cm

fine-loamy, accumulations of
gypsum or carbonates

Fajada

Fine, accumulations of
gypsum or carbonates

Patel

Paralithic contact > 100cm

Fine-loamy, accumulations of
gypsum or gypsum and
carbonates

Benally

Fine-loamy, no accumulations
of gypsum

Uffens

Fine, accumulations of
gypsum or carbonates

Hoskey

Haplargids:

Lithic or Paralithic contact < 50cm	<u>Monierco</u>
Lithic or Paralithic contact from 50-100cm	<u>Bacobi</u>
Lithic or Paralithic contact > 100cm Coarse-loamy, sandy in upper 25cm and lacks a Bk	<u>Mayqueen</u>
Coarse-loamy Bk but no calcic	<u>Shiprock</u>
Coarse-loamy, calcic within 100cm of surface	<u>Shiprock Variant</u>
Fine-Loamy (18%-27% clay) Bk but no calcic	<u>Redlands Variant</u>
Fine-loamy (27%-35% clay) Bk but no calcic	<u>Doak</u>
Fine-loamy (27%-35% clay) no Bk and no calcic	<u>Blancot</u>
Fine-loamy (18%-35% clay) calcic within 100cm	<u>Grieta</u>
Fine-loamy (18%-35% clay) gravely calcic within 100cm	<u>Mack</u>

Orthids:

Calcic horizon within 100cm and calcareous from 18cm to calcic horizon	Calciorthids
No calcic horizon within 100cm or non-calcareous above the calcic horizon	Camborthids

Calciorthids:

Coarse-loamy (5%-18% clay)	<u>Nakai</u>
Fine-loamy (18%-% clay)	<u>Avalon</u>

Camborthids:

Coarse-loamy (5%-18% clay)	<u>Wingrock</u>
-------------------------------	-----------------

Many soil series and a few map units used in this soil survey are similar to the series and map units used in the San Juan County, NM., Eastern Part Survey (USDA, 1980). However, some changes have occurred. A few soil series names have been changed since 1980 and a few soil series names have been added to identify the soils of the area based upon the most recent nomenclature approved for use in New Mexico by the SCS. Soil series names that have been added or changed are identified as follows:

1. Bacobi is a new series name. This is a moderately deep haplargid.
2. Benally is used to describe Uffens-like soils that have a By or Bk and By horizon.
3. Chipeta is used to describe Farb-like soils that are fine textured.
4. Fajada is used for Muff soils (1980 survey).

5. Gilco is used for Glenton soils (1980 survey).
6. Grieta is a new series name. This is a deep haplargid with a calcic horizon.
7. Hoskey is used to describe Uffens-like soils that are fine textured.
8. Jocity is used for Youngston soils (1980 survey).
9. Mack is a new series name. This is a deep haplargid with a gravely calcic horizon.
10. Nakai is used to describe Avalon-like soils that are coarse-loamy.
11. Patel is used to describe Fajada-like soils that are fine textured.
12. Razito is used to describe Shepard-like soils that are 7.5 YR or 10 YR in color.
13. Redlands Variant is a variant of Redland soils which are deep haplargids with 5 YR colors. The variant has a 7.5 YR or 10 YR color.
14. Trail is used for Beebe soils (1980 survey).
15. Tsaya is used to describe Farb-like soils that are loamy-skeletal.
16. Wingrock is used to describe Avalon-like soils that are coarse-loamy and lack a calcic horizon.

8.8 SOIL SERIES DESCRIPTIONS AND LABORATORY DATA

Soil series descriptions and laboratory data typifying the pedon are provided in APPENDIX 8-F by alphabetical series designation.

8.9 PRIME FARMLAND INFORMATION

8.9.1 Investigation of Prime Farmland

BHP conducted an investigation of the permit area to determine whether lands within it could be determined to be prime farmland.

8.9.2 Results of Investigation

Results of the investigation follow:

1. The area within the lease has not been historically used as cropland.
2. The permit area has an average annual precipitation of six inches and has no naturally sub-irrigated lands.
3. On the basis of a soil survey of the lands within the permit area, no soil mapping units can be classified as prime farmland under the definition of prime farmland by the USDA SCS (7 CFR 657.5).
4. APPENDIX 8-G (BIA-Land Operations letter) and (USDA-SCS letter) verify that there is no prime farmland within the permit area.

8.9.3 Conclusion

Based on the above, BHP concludes that there is no prime farmland within the permit area.

8.10 **REGOLITH SAMPLING PROGRAM**

8.10.1 Introduction

Navajo Mine soils can be generally classified into three major groups: 1. Badlands, occupying approximately 1/3 of the area remaining to be mined as of 12/1993. This group is essentially exposed bedrock and is an unsuitable source of topdressing. 2. Natrargids, sodium affected soils, which occupy about 1/3 of the area remaining to be mined. These soils are shallow, moderately deep and deep and have formed from residuum or alluvium. The dominant soil textures are fine-loamy and clayey. The Natrargids are an unsuitable source of topdressing. Some of these soils are covered with a thin mantle of eolian material (<20 inches) which is commonly a suitable source of topdressing. The eolian material is used as topdressing when it is available. 3. A complex of sandy, coarse-loamy and fine-loamy textured soils. They are derived from eolian and alluvial sources that are shallow, moderately deep and deep. These soils occur on mesas, alluvial terraces, flood plains and eolian dunes. Soils in this group are the major sources of suitable topdressing.

Regolith

Regolith is the unconsolidated mantle of surface deposits overlying bedrock derived from either alluvial or eolian sources. The amount of suitable topdressing available from the regolith at the mine is most often controlled by its depth to bedrock or sodium content. The 1988 Soil Resources Survey for Navajo Mine addressed the potential topdressing occurring in the upper portion of the regolith profile. The lower portion of the regolith profile may contribute a significant amount of additional suitable topdressing for reclamation. The extent of these materials is not known at Navajo Mine and, therefore, the following is a proposal to determine the amount of suitable topdressing in the remaining regolith.

8.10.2 Procedures

The regolith sampling program was conducted under the direction of an ARCPACS Certified Professional Soil Scientist. The objective of the regolith sampling program was to identify all soil mapping delineations from the 1988 Soil Resources Survey, that contain suitable topdressing material. The delineations that will be sampled are undisturbed areas within the present lease that: 1) will be mined; 2) have an average depth of bedrock of suitable topdressing depth of 60 inches or greater, and 3) have a total combined area (suitable adjacent areas may be combined) of five acres or more. The Badlands and the Natrargids were excluded from this sampling program because they consistently have unsuitable topdressing material throughout the regolith profile.

Regolith Sampling

A mine-wide grid system specifically designed for the regolith sampling program was developed. The grid system consisted of sampling points spaced on 400 foot centers. Sampling points were located in the soil delineations to be sampled (see items 1), 2) and 3) above). At each sampling point, a soil profile was exposed by backhoe to a depth of approximately 8 feet or bedrock, whichever occurred first. These sampling points were referred to as test-pit sites.

Test-Pit Description

Each test-pit site was described and suitability determined for the major horizons. The determination of suitability was made using a combination of field techniques and laboratory analysis of sampled soil horizons. Horizons determined to be suitable for topdressing, using field evaluations, were sampled. Field evaluation of suitability is determined by texture, consistence, salt content and vegetal characteristics. Remaining horizons were sampled and suitability determined from laboratory analyses. Sample collection, handling and transporting were in accordance to the approved QA/QC Program (CHAPTER 12, APPENDIX 12-A).

Drilling

After the test-pit sampling is completed a drilling program was initiated. Drill sites were located based on the results of the test-pit sampling program. A drill site was selected at a test-pit site only if bedrock was not reached. Every soil mapping delineation containing one or more test-pit site(s) that did not reach bedrock had at least one drill site. Large mapping delineations had drill sites at a minimum distance of 800 feet from one another. Approximately 1/4 of the test-pit sites were selected as drill sites.

Drill Site Sampling

A core-barrel auger was used to produce a continuous undisturbed soil core at each drill site. A sample of the soil core represents at least one foot but no more than a 10 foot interval. Sampling intervals were based on the similarity of one or more of the following field soil characteristics: texture, color, salts, and consistence. The suitability of the samples was determined using laboratory analyses. Sample collection, handling, and transportation were in accordance to the approved QA/QC Program (CHAPTER 12, APPENDIX 12-A).

Laboratory Analyses

Samples from both the test-pit and drilling programs were sent to a soil analytical laboratory for analysis. The following analysis was performed on each sample: [listing per Special Condition B.12; OSM's July 14, 1992 letter to BHP and found in Permit NM-0003C, CHAPTER 18, page 18-15dd]

1. Texture,
2. Saturation Percentage,
3. pH,
4. Electrical Conductivity,
5. Sodium Adsorption Ratio,

6. Acid-Base Account,
7. Boron,
8. Selenium (Total), and
9. Selenium (Soluble).

The suitability of each sample as topdressing material was determined by the "New Mexico Overburden and Soils Inventory and Handling Guidelines", (NM Guidelines), CHAPTER 11, TABLE 11-2. Those samples that were determined to be unsuitable for use as topdressing were further evaluated for suitability as root zone material under the NM Guidelines. Samples determined as unsuitable for root zone material under the NM Guidelines was further evaluated for suitability under the "OSM Root Zone Suitability Criteria for the Navajo Mine".

Sample Sites

A total of 2,124 test pits and drill sites were sampled over the course of the sampling program.

Sampling Program Results

Detailed results of the sampling program were presented as the “final product” to OSM in a two volume report titled Navajo Mine Topdressing and Regolith Quantity Study. This report was submitted to OSM on February 9, 1994.

Pages 8-40 through 8-43 blank due to reformat

8.11 REFERENCES

Fenneman, N. M. 1983. Physiography of the Western United States. McGraw-Hill Book., New York.

Hunt, C. B. 1956. Cenozoic Geology of the Colorado Plateau. U. S. Geol. Surv. Professional Paper, 279p.

Soil Survey Staff. 1951. Soil Survey Manual. USDA-Soil Conservation Service, Handbook, 18p.

Soil Survey Staff. 1975. Soil Taxonomy. USDA-Soil Conservation Service, Agriculture Handbook, 436p.

Thornbury, W. D. 1964. Regional geomorphology of the United States. John Wiley and Sons, Inc. pp. 405-440.

USDA. 1980. Soil Survey of San Juan County, New Mexico, Eastern Part. USDA-Soil Conservation Service.

APPENDIX 8-A

METHODS OF SOIL ANALYSIS

APPENDIX 8-A

METHODS OF SOIL ANALYSIS.

The following procedures have been utilized to identify the respective parameters of the soil samples.

1. pH:

USDA Handbook 60, Method (21a), pg. 102.

2. Conductivity (mmhos/cm @ 25°C):

USDA Handbook 60 Method (3a), pg. 84
and Method (4b), pg. 89.

3. Soluble Ca, Mg, Na (meq/l):

USDA Handbook 60, Method (3a), pg. 84.
Analysis by AA or ICP.

4. Sodium Absorption Ratio (SAR):

Calculated from: USDA Handbook 60, pg. 26.

5. Saturation (%):

USDA Handbook 60, Method (27a) pg 107,
or Method (27b), pg. 107.

6. Particle size analysis (% sand, silt, clay):

ASA Mono. No. 9, Pt 1, Method (43-5) pgs. 562-566.

7. Cation Exchange Capacity (meq/100g):

ASA Mono. No. 9, Pt 2 (2nd Ed), Method (8-3),
pgs 152-154.

8. Exchangeable sodium (meq/100g):

ASA Mono. No. 9, Pt 2 (2nd Ed), Method (13-4.3),
pgs 238-240.

9. Exchangeable sodium percentage (%):

$$\text{Calculated: } \frac{\text{ES}}{\text{CEC}} \times 100$$

10. Neutralization Potential (% CaCO₃):

USDA Handbook 60, Method (23c), pg. 105.

APPENDIX 8-A References:

ASA Monograph No. 9, Part 1, (First Edition). C.A. Black (Ed),
Methods of Soil Analysis - Physical and Mineralogical
Properties, Including Statistics of Measurement and Sampling.
American Society of Agronomy, Inc., Madison, WI, 1965.

ASA Monograph No. 9, Part 2, (First Edition). C.A. Black (Ed),
Methods of Soil Analysis - Chemical and Microbiological
Properties. American Society of Agronomy, Inc., Madison, WI,
1965.

ASA Monograph No. 9, Part 2, (Second Edition). C.A. Black (Ed),
Methods of Soil Analysis - Chemical and Microbiological
Properties. American Society of Agronomy, Inc., Madison, WI,
1982.

USDA Handbook 60. Diagnosis and Improvement of Saline and Alkali
Soils. U.S. Salinity Laboratory Staff, Washington, D.C.,
1954.

APPENDIX 8-B
SOIL SAMPLE CHARACTERISTICS
BY MINE AREA.

TABLE	Area
TABLE 8-B-1	I
TABLE 8-B-2	II
TABLE 8-B-3	II (Block B)
TABLE 8-B-4	III
TABLE 8-B-5	IV North
TABLE 8-B-6	EQ 5/6
TABLE 8-B-7	EQ 7/8
TABLE 8-B-8	EQ 9
TABLE 8-B-9	EQ 10
TABLE 8-B-10	EQ 11/12
TABLE 8-B-11	EQ 13
TABLE 8-B-12	EQ 15
TABLE 8-B-13	EQ 25

TABLE 8-B-1. Soil sample characteristics in Area I.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	RAZITO	LS	19	59
2	HUERFANO	CL	1.5	0
3	UFFENS	LS	1.5	10
4	RAZITO	S	2	60
5	UFFENS	LS	2	14
6	SHIPROCK	SL	0.5	23
7	RAZITO	LS	2.5	60
8	SHIPROCK VARIANT	LS	0.5	60
9	MAYQUEEN	LS	0.1	36
10	UFFENS	SCL	0	0
11	RAZITO	LS	2.5	33
12	RAZITO	LS	1.5	28
13	MAYQUEEN	LS	9	37
14	MAYQUEEN	LS	1	67
15	HUERFANO	CL	4	0
16	UFFENS	SCL	3	0
17	UFFENS	SCL	3	0
18	HUERFANO	SL	1	0
19	RAZITO	LS	1	59
20	FAJADA	SL	1	0
21	RAZITO	LS	1	12
22	RAZITO	LS	1	12
23	SHIPROCK	LS	1	49
24	MAYQUEEN	LS	1	87
25	SHIPROCK	SL	1	26
26	MAYQUEEN	LS	1	56
27	MAYQUEEN	LS	1	59
28	MAYQUEEN	LS	1	37
29	UFFENS	SCL	0	4
30	UFFENS	SCL	0	0
31	HUERFANO	LS	1	4
32	RAZITO	LS	3	25
33	MAYQUEEN	LS	1	46
34	MAYQUEEN	LS	1	66
35	MAYQUEEN	LS	0.5	48
36	MAYQUEEN	LS	1	87
37	SHIPROCK	SL	1	79
38	SHIPROCK	LS	1	59

TABLE 8-B-1 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
39	MAYQUEEN	LS	1	53
40	SHIPROCK	SL	1	7
41	SHIPROCK	SL	1	40
42	HUERFANO	CL	10	0
43	MAYQUEEN	LS	4	79
44	REDLANDS VARIANT	SL	4	79
45	MAYQUEEN	LS	1	65
46	MAYQUEEN	LS	1	24
47	MAYQUEEN	LS	1	56
48	MAYQUEEN	LS	1	52
49	RAZITO	S	4	73
50	SHIPROCK	SL	0.5	19
51	RAZITO	LS	1	70
52	RAZITO	LS	0.5	18
53	RAZITO	LS	1	60
54	MAYQUEEN	LS	2	37
55	RAZITO	LS	1	8
56	MAYQUEEN	LS	1	39
57	MAYQUEEN	LS	1	48
58	FAJADA	SL	0.5	0
59	MAYQUEEN	LS	1	16
60	RAZITO	S	1	79
61	MAYQUEEN	LS	1	31
62	SHIPROCK	LS	1	41
63	MAYQUEEN	LS	1	33
64	HUERFANO	SCL	2	0
65	SHIPROCK	SL	1	19
66	MAYQUEEN	LS	1	30
67	MAYQUEEN	LS	1	43
68	RAZITO	LS	1	39
69	HUERFANO	CL	2	0
70	MAYQUEEN	LS	3	40
71	SHIPROCK	SL	3	79
72	MAYQUEEN	LS	3	79
73	SHIPROCK	SL	1.5	69
74	SHIPROCK	LS	0.5	48
75	RAZITO	LS	3	87
76	SHIPROCK	LS	1	59

TABLE 8-B-1 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
77	MAYQUEEN	LS	3	79
78	FAJADA	SCL	0.5	0
79	MAYQUEEN	LS	2	22
80	HUERFANO	CL	3	0
81	UFFENS	SL	0.5	11
82	RAZITO	LS	4	91
83	BLANCOT	SCL	2	20
84	SHIPROCK	SL	2	69
85	GILCO	SL	2	69
86	RAZITO	LS	1	79
87	MAYQUEEN	LS	1	69
88	RAZITO	S	1.5	79
89	UFFENS	SL	1	6
90	RAZITO	S	3	79
91	HUERFANO	SL	5	0
92	GILCO	SL	1	75
93	GILCO	SL	1	79
94	JOCITY	SL	1	79
95	BLANCOT	SCL	1	79
96	SHIPROCK	SL	6	69
97	MAYQUEEN	LS	6	59
98	UFFENS	SCL	1	0
99	SHIPROCK	SL	1	74
100	SHIPROCK	SL	1	73
101	RAZITO	LS	4	48
102	RAZITO	LS	1	66
103	RAZITO	LS	1	14
104	MAYQUEEN	LS	1	43
105	JOCITY	SL	1	39
106	RAZITO	SL	2	15
107	RAZITO	S	3	52
108	RAZITO	LS	4	75
109	HUERFANO	SL	1.5	0
110	BLANCOT	SL	1	79
111	JOCITY	CL	1	81
112	UFFENS	SCL	1	2
113	UFFENS	SCL	1	0
114	UFFENS	SCL	1	0

TABLE 8-B-1 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
115	HUERFANO	CL	1	0
116	SHIPROCK	SL	5	79
117	HUERFANO	SCL	5	0
118	HUERFANO	CL	5	0
119	UFFENS	SCL	1.5	0
120	HUERFANO	SCL	1.5	6
121	JOCITY	CL	1.5	25
122	JOCITY	CL	1	30
123	JOCITY	SCL	1.5	43
124	FAJADA	CL	1.5	0
125	UFFENS	CL	1.5	6
126	UFFENS	CL	1.5	0
127	JOCITY	CL	1	34
128	MAYQUEEN	LS	1	28
129	RAZITO	LS	1.5	71
130	HUERFANO	CL	5	0
131	UFFENS	SCL	5	0
132	UFFENS	SCL	1	0
133	SHIPROCK	LS	5	22
134	RAZITO	LS	1	59
135	BLANCOT	SL	5	79
136	BLANCOT	SCL	1	31
137	MAYQUEEN	LS	1.5	79
138	GILCO	SL	3	79
139	GILCO	LS	1	79
140	JOCITY	LS	1.5	24
141	GILCO	LS	1	79
142	MAYQUEEN	LS	1	75
143	MAYQUEEN	LS	1	79
144	UFFENS	CL	1.5	0
145	FAJADA	SCL	1.5	0
146	GILCO	SCL	1	79
147	UFFENS	CL	2	0
148	JOCITY	CL	1	4
149	UFFENS	CL	1.5	0
150	PERSAYO	SCL	2	10
151	PERSAYO	SCL	3	8
152	NAKAI	SL	5	4

TABLE 8-B-1 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
153	MONIERCO	SL	2	10
154	BACOBI	SL	1	22
155	BACOBI	SL	2	22
156	WINGROCK	SL	3	8
157	SHIPROCK VARIANT	GSL	4	28
158	SHIPROCK	SL	4	55
159	SHIPROCK	SL	5	39
160	FARB	SL	2	20
161	MONIERCO	SL	5	11
162	WINGROCK	SL	3	8
163	NAKAI	SL	4	6
164	BACOBI	SL	6	17
165	MONIERCO	SL	5	11
166	MONIERCO	SL	5	12
167	MONIERCO	SL	3	6
168	MONIERCO	SL	2	9
169	BACOBI	SL	2	14
170	BACOBI	SL	4	12
171	MONIERCO	SL	4	7

TABLE 8-B-2. Soil sample characteristics in Area II.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	FAJADA	SCL	3.5	0
2	UFFENS	SCL	2.5	0
3	UFFENS	SCL	0.5	0
4	UFFENS	SCL	3	0
5	MAYQUEEN	S	2	60
6	HUERFANO	CL	2	0
7	SHIPROCK	SL	0.5	80
8	HUERFANO	CL	4	0
9	UFFENS	CL	0.5	6
10	RAZITO	LS	1.5	79
11	SHIPROCK	SL	1.5	79
12	SHIPROCK	LS	1	70
13	SHIPROCK	LS	1.5	79
14	MAYQUEEN	LS	1.5	79
15	SHIPROCK	SL	1	38
16	DOAK	SL	1	49
17	UFFENS	SCL	1.5	2
18	UFFENS	SCL	1.5	0
19	BLANCOT	SCL	5	50
20	UFFENS	SCL	5	0
21	TRAIL	SL	5	6
22	TRAIL	SL	5	0
23	MAYQUEEN	LS	1.5	79
24	UFFENS	CL	1.5	4
25	JOCITY	SCL	1	79
26	JOCITY	CL	1.5	79
27	JOCITY	CL	1	79
28	JOCITY	CL	1	79
29	JOCITY	CL	1	71
30	HUERFANO	CL	1	0
31	FAJADA	SCL	1.5	0
32	HUERFANO	CL	1.5	0
33	HUERFANO	CL	1.5	0
34	SHIPROCK	SL	5	47
35	SHIPROCK	SL	5	26
36	SHIPROCK	SL	1.5	20
37	HUERFANO	SCL	1	0
38	RAZITO	LS	1.5	79

TABLE 8-B-2 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
39	SHIPROCK	SL	5	79
40	SHIPROCK	SL	5	79
41	SHIPROCK	SL	5	44
42	FAJADA	SL	5	0
43	FAJADA	SL	5	0
44	HUERFANO	CL	1.5	0
45	HUERFANO	CL	1.5	0
46	HUERFANO	SCL	1.5	0
47	SHIPROCK	SL	5	35
48	MACK	SL	5	79
49	SHIPROCK	SL	5	39
50	HUERFANO	SCL	3	0
51	HUERFANO	CL	7	0
52	FAJADA	SCL	6	0
53	SHIPROCK	SL	1	47
54	FAJADA	CL	0	0
55	FAJADA	CL	0.5	0
56	REDLANDS VARIANT	SL	1.5	79
57	SHIPROCK	SL	4	59
58	MAYQUEEN	LS	7	83
59	RAZITO	LS	5	79
60	RAZITO	LS	4	83
61	RAZITO	LS	2	79
62	SHIPROCK	SL	1	44
63	RAZITO	LS	4	75
64	RAZITO	LS	1	83
65	FAJADA	LS	1	11
66	RAZITO	LS	1	50
67	MAYQUEEN	LS	1.5	63
68	RAZITO	LS	1	83
69	RAZITO	LS	4	98

TABLE 8-B-3. Soil sample characteristics in Block B.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	HUERANO	CL	3	0
2	SHIPROCK	SCL	2	37
3	SHIPROCK	LS	2	55
4	SHIPROCK	SCL	1	75
5	REDLANDS VARIANT	SCL	1	71
6	BENALLY	CL	2	4
7	SHIPROCK	LS	2	52
8	SHIPROCK	SL	2	47
9	HUERFANO	CL	1	0
10	FAJADA	CL	2	6
11	UFFENS	SCL	3	8
12	HUERFANO	CL	1	6
13	HUERFANO	CL	1	0
14	REDLANDS VARIANT	SCL	2	89
15	FRUITLAND	SCL	5	33
16	RAZITO	SCL	5	98
17	BACOB	CL	1	4
18	HUERFANO	CL	7	0
19	SHIPROCK	FSL	2	10
20	SHIPROCK	SL	5	75
21	HUERFANO	CL	1	0
22	FAJADA	SL	3	4
23	FAJADA	CL	2	9
24	FARB	SL	3	4
25	SHIPROCK	SL	1	59
26	HUERFANO	CL	5	5
27	TRAIL	LS	2	98
28	TRAIL	LS	3	75
29	TRAIL	S	2	69
30	TRAIL	S	3	45
31	BADLAND	C	5	0
32	JOCITY	CL	1	0
33	JOCITY	CL	1	0
34	GILCO	CL	1	0
35	JOCITY	C	1	0
36	JOCITY	CL	1	0
37	GILCO	CL	1	0
38	GILCO	CL	0	0

TABLE 8-B-3 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
39	GLLCO	CL	0	0
40	SHIPROCK	LS	2	98
41	SHIPROCK	SL	2	31
42	FRUITLAND	LS	3	45
43	FARB	LFS	3	10
44	FRUITLAND	SL	5	35
45	RAZITO	LS	2	98
46	SHIPROCK	S	2	49
47	FAJADA	LS	2	10
48	BACOB	LS	2	14
49	BENALLY	LS	2	15
50	MAYQUEEN	LS	2	98
51	RAZITO	LS	2	83
52	MAYQUEEN	LS	1	31
53	MAYQUEEN	LS	1	79
54	SHIPROCK	LS	1	98
55	SHIPROCK	LS	1	98
56	MAYQUEEN	LS	2	98
57	MAYQUEEN	S	2	98
58	REDLANDS VARIANT	S	2	98
59	SHIPROCK	LS	2	79
60	SHIPROCK	LS	2	110
61	MAYQUEEN	LS	1	108
62	SHIPROCK	S	2	79
63	BENALLY	LS	5	31
64	BENALLY	LS	4	31
65	STUMBLE	LS	3	79
66	SHIPROCK	LS	2	98
67	SHIPROCK	LS	2	98
68	SHIPROCK	LS	3	98
69	SHIPROCK	LS	3	98
70	FRUITLAND	LS	2	20
71	SHIPROCK	LS	1	59
72	SHIPROCK	LS	1	54
73	FARB	LS	2	17
74	SHIPROCK	LS	2	28
75	SHIPROCK	LS	2	25
76	SHIPROCK	LS	1	98

TABLE 8-B-3 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
77	SHIPROCK	LS	2	24
78	SHIPROCK	LS	2	98
79	SHIPROCK VARIANT	LS	2	88
80	MAYQUEEN	S	3	62
81	MAYQUEEN	LS	2	45
82	REDLANDS VARIANT	LS	2	69
83	UFFENS	LS	2	22
84	BACOBI	S	1	18
85	FARB	LS	2	10
86	BACOBI	S	1	30
87	RAZITO	LS	1	51
88	RAZITO	LS	3	35
89	MAYQUEEN	S	2	49
90	FARB	LS	3	13
91	FARB	LS	2	14
92	FARB	LS	3	12
93	FARB	LS	5	16
94	FARB	LS	4	8
95	FARB	S	5	12
96	FARB	LS	5	4
97	MAYQUEEN	LFS	3	98
98	MAYQUEEN	LS	1	142
99	TRAIL	LS	2	26
100	REDLANDS	SL	3	104
101	BENALLY	S	3	3
102	BADLAND	C	2	0
103	HUERFANO	CL	2	0
104	TRAIL	LS	2	35
105	RAZITO	LS	1	138
106	SHIPROCK	LS	5	47
107	SHIPROCK	LS	5	79
108	SHIPROCK	LS	5	118
109	SHIPROCK	LS	3	106
110	BACOBI	LS	2	24
111	FARB	LS	3	10
112	SHIPROCK	SL	2	20
113	SHIPROCK	SL	2	31
114	RAZITO	LS	1	128

TABLE 8-B-3 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
115	TRAIL	LS	3	35
116	TRAIL	LS	5	41
117	RAZITO	LS	2	83
118	SHIPROCK	FSL	1	33
119	SHIPROCK	LS	2	41
120	MAYQUEEN	LS	1	57
121	BACOBI	LS	1	24
122	BACOBI	LS	2	26
123	BACOBI	LS	1	30
124	BACOBI	LS	1	20
125	FARB	LS	3	16
126	BACOBI	LS	2	17
127	SHIPROCK	LS	3	49
128	FARB	LS	3	4
129	HUERFANO	SL	6	0
130	FAJADA	LS	3	15
131	BACOBI	SL	2	24
132	BACOBI	LFS	1	21
133	FARB	LS	2	18
134	BACOBI	SL	1	37
135	MONIERCO	LS	2	19
136	BACOBI	LS	2	23
137	FARB	LS	3	19
138	FARB	LS	4	12
139	FARB	LS	5	16
140	FARB	LS	3	0
141	SHIPROCK	LS	3	45
142	FARB	LS	5	6
143	FARB	LS	3	14
144	GILCO	SCL	0	0
145	GILCO	SCL	0	0
146	GILCO	SCL	1	0
147	GILCO	SCL	1	0
148	GILCO	SCL	1	0

TABLE 8-B-4. Soil sample characteristics in Area III.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	UFFENS	SL	1.5	0
2	GILCO	SL	1.5	60
3	UFFENS	SCL	2	4
4	JOCITY	SCL	1	28
5	REDLANDS VARIANT	SL	2	60
6	REDLANDS VARIANT	SL	0.5	60
7	REDLANDS VARIANT	SL	1	60
8	SHIPROCK	SL	2	60
9	SHIPROCK VARIANT	SL	1	69
10	SHIPROCK VARIANT	SL	1	75
11	BLANCOT	CL	1	31
12	SHIPROCK	SL	1	75
13	UFFENS	SCL	0.5	0
14	SHIPROCK VARIANT	LS	1	60
15	SHIPROCK VARIANT	SL	2	60
16	SHIPROCK VARIANT	SL	2	60
17	SHIPROCK VARIANT	SL	1.5	60
18	SHIPROCK VARIANT	SL	2	60
19	SHIPROCK	SL	4	60
20	SHIPROCK	SL	4	60
21	SHIPROCK	SL	4	60
22	SHIPROCK VARIANT	SL	4	16
23	SHIPROCK	SL	4	60
24	BACOBI	SL	2	24
25	MONIERCO	SL	2	9
26	MONIERCO	SL	2	10
27	MONIERCO	SL	2	16
28	BACOBI	SL	2	31
29	BACOBI	SL	2	30
30	MONIERCO	SL	3	16
31	FARB	SL	3	9
32	BACOBI	SL	2	12
33	BACOBI	SL	2	11
34	BACOBI	SCL	1.5	18
35	REDLANDS VARIANT	SCL	1.5	43
36	REDLANDS VARIANT	SCL	2	36
37	BACOBI	SL	4	36
38	BACOBI	LS	4	48

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
39	UFFENS	SCL	0.5	3
40	UFFENS	CL	0.5	0
41	HUERFANO	C	0.5	0
42	FAJADA	CL	0.5	0
43	FAJADA	C	0.5	3
44	MACK	SL	1	21
45	REDLANDS VARIANT	SL	1	60
46	MACK	SL	2	60
47	BLANCOT	SCL	1	35
48	BLANCOT	SCL	0.5	30
49	BLANCOT	SCL	0.5	28
50	HUERFANO	SCL	1	0
51	UFFENS	SCL	1	6
52	UFFENS	SL	1	5
53	UFFENS	SL	4	5
54	MAYQUEEN	LS	4	40
55	UFFENS	SL	4	6
56	MAYQUEEN	LS	4	60
57	SHIPROCK	SL	2	22
58	MAYQUEEN	LS	1.5	18
59	MAYQUEEN	LS	0	14
60	MAYQUEEN	S	4	30
61	FARB	SL	2	14
62	HUERFANO	SCL	4	0
63	TRAIL	LS	2	0
64	TRAIL	LS	1	8
65	UFFENS	SCL	0	0
66	UFFENS	SL	1	0
67	MAYQUEEN	LS	2	21
68	RAZITO	LS	3	22
69	MAYQUEEN	LS	4	16
70	RAZITO	S	4	25
71	MAYQUEEN	LS	4	60
72	MAYQUEEN	LS	3	44
73	TRAIL	SCL	20	8
74	RAZITO	S	3	33
75	GILCO	LS	0	60
76	RAZITO	S	2	60

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
77	MAYQUEEN	LS	1	60
78	MAYQUEEN	LS	0.5	60
79	MAYQUEEN	LS	2	60
80	UFFENS	SL	2.5	0
81	REDLANDS VARIANT	SL	3.5	33
82	REDLANDS VARIANT	SL	2	14
83	REDLANDS VARIANT	SL	2.5	79
84	DOAK	SL	5	58
85	DOAK	SL	5	58
86	SHIPROCK	SL	8	47
87	SHIPROCK	SL	8	79
88	SHIPROCK	SL	8	45
89	SHIPROCK	SL	4.5	79
90	SHIPROCK	SL	3	28
91	SHIPROCK	SL	1	34
92	HUERFANO	SCL	9	0
93	HUERFANO	SL	4.5	0
94	HUERFANO	C	3	0
95	FAJADA	CL	3.5	0
96	HUERFANO	CL	3	0
97	SHIPROCK	SL	3.5	46
98	UFFENS	SCL	5	0
99	UFFENS	LS	10	6
100	UFFENS	SL	6	4
101	GILCO	SL	1	59
102	FAJADA	SL	1	0
103	UFFENS	CL	3	0
104	BLANCOT	SL	5	22
105	BLANCOT	SL	1	79
106	BLANCOT	SL	1	79
107	SHIPROCK	SL	5.5	56
108	UFFENS	SL	1	4
109	SHIPROCK	SL	4.5	59
110	BLANCOT	SL	6	37
111	UFFENS	SCL	1.5	4
112	UFFENS	SCL	1	0
113	BLANCOT	SL	1	91
114	BLANCOT	SL	4.5	91

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
115	RAZITO	LS	1	79
116	UFFENS	SL	5.5	6
117	UFFENS	SCL	6.5	5
118	FAJADA	CL	1.5	0
119	SHIPROCK	SL	1	59
120	UFFENS	SCL	4	0
121	HUERFANO	CL	3	0
122	HUERFANO	CL	3	0
123	FAJADA	CL	2	0
124	HUERFANO	SCL	1.5	0
125	MAYQUEEN	LS	1.5	39
126	GILCO	LS	2.5	84
127	SHIPROCK	SL	4.5	33
128	UFFENS	SL	4.5	0
129	HUERFANO	CL	3.5	0
130	MAYQUEEN	LS	11	59
131	SHIPROCK	LS	2.5	47
132	SHIPROCK	LS	2.5	30
133	UFFENS	SCL	5.5	0
134	MAYQUEEN	LS	1	47
135	RAZITO	LS	5	59
136	GILCO	LS	1.5	59
137	RAZITO	LS	4.5	59
138	MAYQUEEN	LS	1	71
139	BLANCOT	SL	0	32
140	RAZITO	LS	1	59
141	UFFENS	SL	2	0
142	GILCO	LS	2	28
143	UFFENS	SCL	2	0
144	BLANCOT	SL	3	18
145	UFFENS	CL	2	0
146	BLANCOT	SCL	4.5	43
147	BLANCOT	SL	3	63
148	UFFENS	SL	5	0
149	BACOB I	SL	2.5	25
150	SHIPROCK	SL	2.5	46
151	SHIPROCK	SL	6	69
152	BLANCOT	SCL	1	33

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
153	UFFENS	SCL	1	4
154	BLANCOT	SCL	1	27
155	BLANCOT	SL	1	31
156	BLANCOT	SL	1	79
157	BLANCOT	SCL	1	79
158	STUMBLE	LS	6	47
159	STUMBLE	LS	3	20
160	STUMBLE	LS	1	35
161	RAZITO	LS	1	27
162	MAYQUEEN	LS	1	51
163	UFFENS	SL	8	0
164	FAJADA	SCL	3	17
165	HUERFANO	CL	6.5	0
166	HUERFANO	CL	6	0
167	SHIPROCK	SL	3.5	35
168	TRAIL	SL	3	6
169	JOCITY	SL	1	63
170	UFFENS	SCL	0	0
171	UFFENS	SCL	4	4
172	UFFENS	SCL	9	0
173	RAZITO	LS	1	79
174	RAZITO	LS	1	75
175	UFFENS	SL	0	10
176	MAYQUEEN	LS	1	75
177	RAZITO	LS	1	69
178	SHIPROCK	SL	8	45
179	MAYQUEEN	LS	7	37
180	UFFENS	SL	1	0
181	JOCITY	SL	2	35
182	JOCITY	SL	8.5	59
183	HUERFANO	SCL	3	0
184	HUERFANO	CL	4	0
185	HUERFANO	CL	6	0
186	HUERFANO	CL	6	0
187	MAYQUEEN	LS	5	43
188	HUERFANO	SCL	0	0
189	FAJADA	CL	4.5	0
190	UFFENS	SCL	1	5

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
191	UFFENS	SCL	1	0
192	HUERFANO	CL	1	0
193	UFFENS	CL	1	0
194	UFFENS	SL	2.5	0
195	SHIPROCK	SL	2.5	30
196	MAYQUEEN	LS	2.5	30
197	UFFENS	SL	0	0
198	TRAIL	LS	14	10
199	TRAIL	LS	3	0
200	UFFENS	SCL	1.5	0
201	UFFENS	SCL	1.5	0
202	UFFENS	SCL	1.5	6
203	UFFENS	SL	1.5	10
204	SHIPROCK	SL	1.5	47
205	BLANCOT	SL	1.5	43
206	TRAIL	LS	10	0
207	RAZITO	LS	9	23
208	HUERFANO	CL	3	0
209	HUERFANO	CL	3	0
210	GILCO	SL	4	79
211	HUERFANO	SCL	1	0
212	UFFENS	SCL	1	0
213	UFFENS	CL	1	0
214	HUERFANO	SCL	1	0
215	UFFENS	SCL	0	0
216	HUERFANO	SCL	1	0
217	HUERFANO	CL	0	0
218	HUERFANO	CL	0	0
219	UFFENS	SCL	1	0
220	HUERFANO	CL	0	0
221	SHIPROCK	SL	6	12
222	RAZITO	LS	2	91
223	UFFENS	SCL	1	0
224	FAJADA	SCL	8	0
225	HUERFANO	CL	1	0
226	HUERFANO	SCL	1	0
227	RAZITO	LS	6	43
228	MAYQUEEN	LS	3.5	54

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
229	JOCITY	SL	1	0
230	JOCITY	SCL	1	27
231	JOCITY	SCL	1	4
232	BLANCOT	SCL	2	79
233	JOCITY	SCL	1	22
234	JOCITY	S	1	83
235	UFFENS	CL	8.5	0
236	JOCITY	SL	1	5
237	JOCITY	SL	1	6
238	SHIPROCK	SL	2.5	26
239	DOAK	SL	5	73
240	RAZITO	LS	5	57
241	FAJADA	SCL	1	0
242	HUERFANO	CL	0.5	0
243	HUERFANO	CL	0.5	0
244	HUERFANO	CL	0.5	0
245	UFFENS	CL	0.5	0
246	REDLANDS VARIANT	LS	3.5	39
247	FAJADA	CL	1	0
248	UFFENS	CL	1	0
249	UFFENS	SCL	2	3
250	UFFENS	CL	0	0
251	UFFENS	CL	1	0
252	HUERFANO	SL	1.5	4
253	FAJADA	SL	2	8
254	BLANCOT	SL	3	18
255	SHIPROCK	LS	4	36
256	MAYQUEEN	LS	5	79
257	BLANCOT	SL	0	21
258	BLANCOT	SCL	0	13
259	BLANCOT	SL	0	31
260	BLANCOT	SL	1	44
261	UFFENS	CL	0	0
262	UFFENS	C	0	0
263	UFFENS	C	0	0
264	UFFENS	C	0	0
265	BLANCOT	CL	0	11
266	BLANCOT	SCL	1	28

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
267	BLANCOT	SCL	2	29
268	FAJADA	SCL	1	0
269	BLANCOT	SCL	2.5	35
270	HUERFANO	SCL	0	0
271	UFFENS	CL	0	0
272	BLANCOT	SCL	0	19
273	BLANCOT	SL	0	22
274	DOAK	SCL	1	36
275	SHIPROCK	SL	1	71
276	BLANCOT	SCL	1	18
277	BLANCOT	SCL	1	15
278	HUERFANO	CL	0	0
279	HUERFANO	CL	1	0
280	HUERFANO	CL	0	0
281	BLANCOT	SCL	0	26
282	BLANCOT	SCL	0	47
283	BLANCOT	SCL	10	11
284	BLANCOT	SCL	0	10
285	BLANCOT	SCL	0	13
286	BLANCOT	SCL	0	15
287	BLANCOT	SCL	0	11
288	BLANCOT	SCL	0	14
289	MACK	SCL	2	87
290	MACK	SL	3	79
291	MACK	SL	3	83
292	REDLANDS VARIANT	SL	0.5	85
293	MACK	SCL	1	89
294	MACK	SL	4	79
295	REDLANDS VARIANT	SCL	1	79
296	MACK	SCL	0.5	37
297	REDLANDS VARIANT	SL	0.5	85
298	REDLANDS VARIANT	SL	0.5	79
299	REDLANDS VARIANT	SL	0.5	87
300	REDLANDS VARIANT	SL	0.5	76
301	MACK	SL	0.5	79
302	MACK	SL	4	85
303	MACK	SL	1	79
304	BLANCOT	SCL	0.5	67

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
305	UFFENS	CL	5	0
306	UFFENS	CL	5	0
307	BLANCOT	CL	0.5	20
308	HUERFANO	CL	0.5	0
309	HUERFANO	CL	1	0
310	HUERFANO	CL	1	0
311	DOAK	SL	7	39
312	DOAK	SL	0.5	39
313	DOAK	SCL	1	14
314	UFFENS	SCL	0.5	3
315	HUERFANO	CL	1	0
316	HUERFANO	CL	1	0
317	HUERFANO	CL	1.5	0
318	HUERFANO	CL	1.5	0
319	HUERFANO	SCL	1	0
320	UFFENS	CL	0.5	4
321	UFFENS	SCL	0.5	4
322	UFFENS	CL	0.5	4
323	UFFENS	CL	1	4
324	UFFENS	SCL	3	4
325	REDLANDS VARIANT	SL	0.5	79
326	MACK	SL	0.5	78
327	MACK	SL	2	85
328	REDLANDS VARIANT	SL	0.5	81
329	REDLANDS VARIANT	SL	0	79
330	REDLANDS VARIANT	SL	0.5	74
331	REDLANDS VARIANT	SCL	0.5	71
332	REDLANDS VARIANT	SCL	0	78
333	REDLANDS VARIANT	SL	0	69
334	REDLANDS VARIANT	SL	0.5	75
335	MACK	SL	0	71
336	MACK	SL	0	69
337	MACK	SL	0	0
338	BLANCOT	SCL	4	69
339	REDLANDS VARIANT	SCL	2	71
340	REDLANDS VARIANT	SL	1	71
341	REDLANDS VARIANT	SL	0.5	67
342	MACK	SL	0.5	69

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
343	MACK	SL	0.5	75
344	MACK	SL	0.5	75
345	REDLANDS VARIANT	SL	0.5	75
346	MACK	SL	0.5	79
347	REDLANDS VARIANT	SL	0.5	67
348	MACK	SL	0.5	78
349	MACK	SL	2	79
350	MACK	SL	2	69
351	DOAK	SCL	2	68
352	SHIPROCK	SL	3	67
353	SHIPROCK	SL	5	69
354	UFFENS	SCL	0.5	0
355	UFFENS	SCL	1	0
356	HUERFANO	C	1	0
357	HUERFANO	CL	0.5	0
358	HUERFANO	CL	0.5	0
359	HUERFANO	SCL	1	0
360	UFFENS	C	0	0
361	FAJADA	C	0	0
362	UFFENS	C	0	0
363	UFFENS	C	0	0
364	UFFENS	CL	0	0
365	UFFENS	SCL	1.5	0
366	SHIPROCK	SL	1.5	69
367	SHIPROCK	SL	0.5	75
368	SHIPROCK VARIANT	SL	0	75
369	SHIPROCK VARIANT	SL	0.5	63
370	SHIPROCK VARIANT	SL	0.5	74
371	SHIPROCK VARIANT	SL	1.5	79
372	SHIPROCK	SL	3	71
373	SHIPROCK	SL	0.5	67
374	SHIPROCK VARIANT	SL	0.5	63
375	SHIPROCK	SL	0.5	75
376	SHIPROCK VARIANT	SL	0.5	75
377	SHIPROCK	SL	1.5	70
378	SHIPROCK	SL	1	69
379	SHIPROCK	SL	1	75
380	UFFENS	SL	1	0

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
381	UFFENS	CL	0	0
382	HUERFANO	CL	0	0
383	MONIERCO	SCL	1.5	11
384	MONIERCO	SL	0.5	15
385	MONIERCO	SL	1	12
386	MONIERCO	SL	0.5	12
387	MONIERCO	SL	1.5	11
388	DOAK	SL	0.5	25
389	DOAK	SL	0.5	31
390	SHIPROCK	LS	2	72
391	UFFENS	CL	0	0
392	UFFENS	SL	0.5	0
393	BACOB	SL	2	23
394	MONIERCO	SL	1.5	12
395	BACOB	SL	1	21
396	MONIERCO	SCL	0.5	0
397	MONIERCO	CL	0.5	0
398	MONIERCO	SCL	0.5	7
399	BACOB	SCL	0.5	33
400	BACOB	SCL	0.5	24
401	MONIERCO	SL	1	16
402	RAZITO	LS	0.5	20
403	SHIPROCK	LS	0.5	36
404	UFFENS	CL	0	0
405	TRAIL	SL	0	4
406	TRAIL	SL	1	12
407	REDLANDS VARIANT	SL	0.5	37
408	REDLANDS VARIANT	SL	0.5	14
409	SHIPROCK	LS	5	58
410	SHIPROCK	LS	0.5	69
411	TRAIL	LS	2	8
412	SHIPROCK VARIANT	LS	3	41
413	MONIERCO	SL	1	10
414	MONIERCO	SL	3	10
415	MONIERCO	SL	2	10
416	UFFENS	CL	0.5	0
417	UFFENS	CL	0.5	0
418	MONIERCO	SL	1	6

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
419	MONIERCO	SL	0	15
420	MONIERCO	SL	1	11
421	UFFENS	SCL	1	0
422	MONIERCO	SL	1.5	17
423	MONIERCO	SL	1	7
424	MONIERCO	SL	1	15
425	MONIERCO	SL	1	12
426	MONIERCO	SL	1.5	17
427	BACOBI	SL	1.5	22
428	MONIERCO	SCL	2.5	2
429	BACOBI	SL	2	33
430	UFFENS	SL	1.5	0
431	UFFENS	CL	0.5	0
432	UFFENS	LS	0.5	8
433	FAJADA	LS	0	12
434	HUERFANO	SL	1	5
435	FAJADA	LS	1	12
436	FAJADA	SL	1	16
437	UFFENS	LS	1	12
438	UFFENS	LS	1	8
439	UFFENS	LS	1	8
440	MONIERCO	SL	2	4
441	MONIERCO	SL	2	17
442	UFFENS	LS	1.5	14
443	FAJADA	LS	2	13
444	FAJADA	LS	0.5	10
445	UFFENS	SCL	1	0
446	BACOBI	SL	1	28
447	BACOBI	LS	1	17
448	BACOBI	SL	1	14
449	FAJADA	SCL	1	0
450	MONIERCO	SL	0.5	14
451	BACOBI	SL	1	19
452	BACOBI	SL	1	13
453	AVALON	SL	1	16
454	MONIERCO	SL	1	10
455	UFFENS	CL	1	0
456	SHIPROCK	SL	2	54

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
457	MONIERCO	SL	1.5	10
458	UFFENS	SCL	0.5	0
459	FAJADA	SCL	1	0
460	REDLANDS VARIANT	SL	1	39
461	SHIPROCK	SL	1	79
462	HUERFANO	SL	1	0
463	RAZITO	LS	2	72
464	FAJADA	SL	2	0
465	FAJADA	SL	1	0
466	FAJADA	C	1	0
467	UFFENS	CL	1	0
468	UFFENS	CL	1	0
469	HUERFANO	CL	1	0
470	FAJADA	CL	1	0
471	SHIPROCK	SL	0.5	79
472	UFFENS	SL	2	0
473	SHIPROCK	LS	4.5	69
474	UFFENS	SCL	6	0
475	UFFENS	SCL	8	0
476	PERSAYO	CL	4	4
477	UFFENS	SCL	1.5	0
478	UFFENS	SCL	12	0
479	REDLANDS VARIANT	SL	1	63
480	HUERFANO	SCL	2.5	0
481	HUERFANO	SCL	1	0
482	HUERFANO	SCL	0.5	0
483	HUERFANO	SCL	0.5	0
484	HUERFANO	SCL	3	0
485	HUERFANO	SCL	3.5	0
486	FAJADA	SCL	5	0
487	HUERFANO	CL	2	0
488	HUERFANO	CL	7	0
489	HUERFANO	CL	2.5	0
490	HUERFANO	CL	7.5	0
491	HUERFANO	CL	0.5	0
492	FAJADA	CL	0.5	0
493	HUERFANO	SCL	2.5	0
494	HUERFANO	SCL	1	0

TABLE 8-B-4 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
495	HUERFANO	SCL	0.5	0
496	HUERFANO	SCL	0.5	0
497	HUERFANO	SCL	3	0
498	HUERFANO	SCL	3.5	0
499	FAJADA	SCL	5	0
500	HUERFANO	CL	2	0
501	HUERFANO	CL	7	0
502	HUERFANO	CL	2.5	0
503	HUERFANO	CL	7.5	0
504	HUERFANO	CL	0.5	0

TABLE 8-B-5. Soil sample characteristics in Area IV.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	SHIPROCK	SL	4	59
2	SHIPROCK	SL	4	63
3	SHIPROCK	SL	3	68
4	SHIPROCK	SL	3.5	31
5	BACOB	SL	1	19
6	SHIPROCK	SL	1	31
7	MONIERCO	SL	1	15
8	HUERFANO	SCL	1	0
9	MONIERCO	SL	0.5	14
10	MONIERCO	SL	0.5	18
11	AVALON	SL	1	31
12	BACOB	SL	1	22
13	BACOB	SL	1	4
14	MONIERCO	SCL	0	11
15	PERSAYO	SL	7.5	11
16	BACOB	SL	4	20
17	AVALON	SL	2	22
18	SHIPROCK	SL	3	42
19	BACOB	SL	1	15
20	AVALON	SL	4	23
21	BACOB	SL	3	19
22	UFFENS	CL	0.5	0
23	MONIERCO	SCL	0.5	8
24	UFFENS	CL	1	0
25	SHIPROCK	SL	1	44
26	MONIERCO	SCL	2	4
27	FAJADA	SCL	1	0
28	MONIERCO	SL	0.5	18
29	BACOB	SL	1.5	20
30	AVALON	SL	2.5	20
31	AVALON	SL	2.5	20
32	FARB	SL	5	10
33	MONIERCO	SL	6.5	17
34	FARB	SCL	3.5	5
35	FARB	SCL	1	3
36	FARB	SL	0.5	4
37	SHIPROCK	SL	4	41
38	BACOB	SL	2	30

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
39	MONIERCO	SL	2	15
40	BACOB I	SL	3.5	19
41	BACOB I	SL	4	15
42	MONIERCO	SL	3	8
43	BACOB I	SL	1	25
44	BACOB I	SL	1.5	19
45	MONIERCO	SL	2.5	14
46	MACK	SL	3	29
47	MAYQUEEN	LS	2	74
48	STUMBLE	SL	11	83
49	NAKAI	SL	9	33
50	MONIERCO	SL	6	14
51	MACK	LS	5	79
52	MONIERCO	SL	1.5	19
53	MONIERCO	SL	3	15
54	MACK	SL	7	94
55	FARB	SL	0.5	4
56	SHIPROCK	SL	7	79
57	MONIERCO	SL	6	17
58	MONIERCO	SL	3.5	14
59	MAYQUEEN	LS	5	61
60	BACOB I	SL	1.5	17
61	BACOB I	SL	2	36
62	MONIERCO	SL	2	18
63	MACK	LS	1.5	64
64	SHIPROCK	SL	3	79
65	STUMBLE	LS	6	79
66	REDLANDS VARIANT	SL	1.5	42
67	REDLANDS VARIANT	SL	1	87
68	MACK	LS	1.5	41
69	BACOB I	SL	0.5	23
70	MONIERCO	SL	1.5	13
71	BACOB I	SL	1.5	18
72	BACOB I	SL	2.5	33
73	BACOB I	SL	5	31
74	REDLANDS VARIANT	LS	0.5	52
75	REDLANDS VARIANT	SL	1.5	35
76	BACOB I	LS	1	30

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
77	BACOB I	LS	1	22
78	MONIERCO	LS	2	16
79	UFFENS	CL	0.5	0
80	UFFENS	SCL	1	0
81	REDLANDS VARIANT	SL	1	51
82	REDLANDS VARIANT	SL	3	39
83	AVALON	SL	4.5	26
84	MONIERCO	SCL	4.5	10
85	HUERFANO	CL	1	0
86	UFFENS	CL	0.5	0
87	REDLANDS VARIANT	LS	1	39
88	REDLANDS VARIANT	SL	0.5	42
89	HUERFANO	CL	0.5	0
90	MACK	SL	3	63
91	MONIERCO	SL	3.5	11
92	PERSAYO	SCL	4	4
93	MONIERCO	SL	1	9
94	MONIERCO	SL	1	11
95	MONIERCO	SL	1	13
96	FAJADA	SCL	2	0
97	FAJADA	SCL	6	0
98	MONIERCO	SL	0.5	15
99	MONIERCO	SL	2.5	10
101	REDLANDS VARIANT	SL	1	43
102	REDLANDS VARIANT	SL	2	54
103	REDLANDS VARIANT	SL	2.5	29
104	UFFENS	SL	4	10
105	MONIERCO	SL	2.5	12
106	FARB	SL	2.5	9
107	AVALON	SL	5	11
108	MONIERCO	SCL	8	17
109	SHIPROCK	SL	4	33
110	MACK	SCL	6	52
111	MONIERCO	SL	4	14
112	FARB	SL	9	4
113	MONIERCO	SL	5	11
114	FARB	SL	7	3
115	MONIERCO	SL	3	13

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
116	MONIERCO	SL	2	13
117	BACOB I	SL	2	31
118	FARB	SL	2	4
119	PERSAYO	SCL	5	3
120	PERSAYO	SCL	9	5
121	FARB	SL	6	3
122	FARB	SL	4	7
123	FARB	SL	2	5
124	FARB	SL	2	5
125	BACOB I	SL	1	20
126	BACOB I	SL	2	22
127	SHIPROCK	SL	2	51
128	BACOB I	SCL	2	32
129	FARB	SL	7	8
130	MONIERCO	SL	2	11
131	MONIERCO	SL	2	12
132	PERSAYO	SCL	2	4
133	MONIERCO	SL	0.5	9
134	MONIERCO	SCL	0.5	17
135	MONIERCO	SCL	4.5	17
136	PERSAYO	CL	7	6
137	PERSAYO	SCL	7.5	6
138	PERSAYO	SCL	2	3
139	MONIERCO	SCL	0.5	5
140	MONIERCO	SL	1	10
141	RAZITO	LS	1	36
142	BACOB I	SL	3	8
143	BACOB I	SL	6	11
144	FARB	SL	8	3
145	RAZITO	LS	2	18
146	FARB	SL	5	3
147	FARB	SL	1	4
148	RAZITO	LS	1	11
149	SHIPROCK	SL	1	34
150	BACOB I	SCL	0.5	13
151	FARB	SL	5	6
152	HUERFANO	SL	1	0
153	FARB	SL	6	4

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
154	HUERFANO	SCL	0.5	0
155	REDLANDS VARIANT	LS	0.5	22
156	RAZITO	LS	2	31
157	RAZITO	LS	5	23
158	REDLANDS VARIANT	LS	1	30
159	FARB	SL	1	5
160	RAZITO	LS	1	18
161	UFFENS	SL	0.5	0
162	SHIPROCK	SL	1.5	34
163	SHIPROCK	SL	1	14
164	HUERFANO	SCL	0.5	0
165	MONIERCO	SL	1.5	14
166	MONIERCO	SL	2	17
167	MONIERCO	SL	4	15
168	MONIERCO	SL	0.5	12
169	SHIPROCK	SL	1.5	33
170	BACOB I	SL	3.5	14
171	FARB	SL	7	6
172	MONIERCO	SL	1	10
173	MONIERCO	SL	3	7
174	PERSAYO	SCL	3	3
175	HUERFANO	CL	3	0
176	MONIERCO	SL	4	19
177	UFFENS	CL	0.5	0
178	FAJADA	SL	2	0
179	MONIERCO	SL	4	14
180	FAJADA	SL	7	0
181	RAZITO	LS	15	12
182	SHIPROCK	LS	1	26
183	BACOB I	SL	1	7
184	SHIPROCK	SL	1	29
185	PERSAYO	SCL	5	3
186	MONIERCO	SL	1.5	7
187	MONIERCO	SL	2	16
188	MONIERCO	SL	0.5	7
189	MAYQUEEN	LS	4	32
190	BACOB I	SL	1	22
191	SHIPROCK	SL	2.5	29

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
192	BACOB I	SL	5	17
193	FARB	SL	2	2
194	PERSAYO	SCL	5	8
195	REDLANDS VARIANT	LS	3	55
196	SHIPROCK	SL	1.5	79
197	MAYQUEEN	LS	1.5	50
198	BACOB I	SL	0.5	17
199	MAYQUEEN	LS	6.5	47
200	BACOB I	SL	1.5	28
201	MONIERCO	SL	1.5	14
202	MONIERCO	SL	1.5	10
203	SHIPROCK	SL	2.5	63
204	SHIPROCK	SL	5.5	17
205	SHIPROCK	SL	9.5	18
206	SHIPROCK	SL	3	16
207	PERSAYO	SCL	1	4
208	MONIERCO	SL	2	15
209	BACOB I	SL	5	25
210	RAZITO	LS	6	41
211	RAZITO	LS	4	20
212	JOCITY	SL	1	32
213	UFFENS	SCL	3	0
214	GILCO	LS	3	34
215	GILCO	SL	1.5	84
216	JOCITY	SL	1	91
217	UFFENS	SCL	1	0
218	GILCO	SL	0.5	79
219	UFFENS	SICL	1.5	0
220	JOCITY	SL	1	49
221	UFFENS	SL	2	0
222	HUERFANO	CL	2	0
223	JOCITY	CL	1	22
224	FAJADA	SCL	1	0
225	HUERFANO	SL	0.5	0
226	UFFENS	SL	1	0
227	HUERFANO	SCL	2	0
228	HUERFANO	LS	1.5	10
229	HUERFANO	LS	1	7

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
230	HUERFANO	SCL	1	0
231	HUERFANO	SCL	1	0
232	GILCO	SL	1	84
233	GILCO	LS	1	69
234	JOCITY	SL	0.5	71
235	UFFENS	CL	1.5	0
236	GILCO	LS	1.5	67
237	GILCO	LS	0.5	71
238	UFFENS	SCL	0.5	0
239	GILCO	SL	0.5	79
240	STUMBLE	SCL	0.5	69
241	TRAIL	LS	1	20
242	UFFENS	GSL	1.5	0
243	HUERFANO	SCL	1	0
244	GILCO	LS	0.5	79
245	GILCO	SL	0.5	30
246	MONIERCO	LS	3	10
247	HUERFANO	CL	8	0
248	HUERFANO	CL	6	0
249	HUERFANO	CL	3	0
250	BACOB	LS	3	28
251	SHIPROCK	LS	2	47
252	REDLANDS VARIANT	SL	3	31
253	TRAIL	SL	3	7
254	BENALLY	SCL	2	0
255	BENALLY	SCL	2	0
256	BENALLY	SCL	2	0
257	BENALLY	SCL	2	0
258	FAJADA	SCL	2	0
259	FAJADA	SCL	3	0
260	DOAK	SCL	4	7
261	SHIPROCK	SL	3	20
262	NAKAI	SL	6	16
263	SHIPROCK VARIANT	SL	4	33
264	BENALLY	SL	3	5
265	GRIETA	SL	2	16
266	HUERFANO	CL	1	0
267	UFFENS	SL	3	4

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
268	FAJADA	SCL	2	0
269	BENALLY	CL	2	0
270	UFFENS	CL	2	0
271	BENALLY	CL	1	0
272	GRIETA	SL	3	17
273	NAKAI	SL	4	8
274	NAKAI	SL	10	14
275	REDLANDS VARIANT	SL	4	51
276	UFFENS	SL	2	6
277	HUERFANO	CL	2	0
278	FAJADA	SCL	1	0
279	NAKAI	SL	3	22
280	SHIPROCK VARIANT	SL	3	22
281	BACOB	SL	5	17
282	FAJADA	SL	1	4
283	SHIPROCK VARIANT	SL	4	28
284	NAKAI	SL	3	12
285	FAJADA	SL	2	4
286	NAKAI	SL	5	6
287	GRIETA	SL	3	22
288	SHIPROCK	SL	5	79
289	SHIPROCK	SL	4	33
290	NAKAI	SL	4	22
291	SHIPROCK VARIANT	SL	4	16
292	SHIPROCK	SL	4	35
293	SHIPROCK	SL	4	10
294	SHIPROCK	SL	4	4
295	HUERFANO	SCL	4	0
296	FAJADA	CL	4	0
297	FAJADA	SL	3	5
298	HUERFANO	SL	3	4
299	MONIERCO	SL	2	9
300	REDLANDS VARIANT	SL	2	22
301	SHIPROCK VARIANT	SL	2	14
302	BENALLY	CL	1	0
303	BENALLY	CL	1	0
304	FAJADA	CL	1	0
305	BENALLY	SL	1	4

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
306	FAJADA	SL	3	10
307	FARB	SL	5	4
308	MONIERCO	SL	2	6
309	BACOB	LS	3	13
310	BACOB	LS	4	26
311	FRUITLAND	SL	3	12
312	FAJADA	LS	3	6
313	RAZITO	LS	2	24
314	RAZITO	S	4	26
315	HUERFANO	CL	1	0
316	HUERFANO	SCL	1	0
317	FRUITLAND	SL	4	6
318	BACOB	SL	3	24
319	MONIERCO	SL	4	8
320	GRIETA	SL	4	22
321	BACOB	SL	2	12
322	BACOB	SL	1	18
323	HOSKEY	C	1	0
324	REDLANDS VARIANT	SL	2	5
325	REDLANDS VARIANT	SL	2	20
326	REDLANDS VARIANT	SL	1	5
327	HOSKEY	C	0	0
328	HOSKEY	C	0	0
329	HOSKEY	CL	1	0
330	MONERICO	SCL	1	4
331	FAJADA	CL	1	0
332	HOSKEY	CL	1	0
333	HOSKEY	CL	1	0
334	GRIETA	SL	3	10
335	GRIETA	SL	3	14
336	GRIETA	SL	4	12
337	BACOB	SL	2	13
338	BACOB	SL	3	7
339	BACOB	SL	4	8
340	HUERFANO	SCL	1	0
341	BENALLY	S	7	8
342	MAYQUEEN	LS	6	37
343	BACOB	SL	3	4

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
344	TSAYA	GSL	2	0
345	FRUITLAND	SL	3	16
346	MONIERCO	SL	2	9
347	RAZITO	LS	2	8
348	REDLANDS VARIANT	SL	2	12
349	FARB	LS	20	12
350	HUERFANO	LS	5	4
351	BENALLY	SL	6	6
352	BACOB	SL	4	12
353	GRIETA	LS	3	12
354	MACK	SL	2	14
355	MACK	SL	4	13
356	GRIETA	SL	2	20
357	BACOB	SL	2	16
358	FAJADA	CL	1	0
359	HOSKEY	CL	1	0
360	UFFENS	SL	1	8
361	HUERFANO	SL	3	4
362	HOSKEY	C	1	0
363	HOSKEY	CL	1	0
364	BENALLY	SL	2	4
365	GRIETA	SL	3	20
366	MACK	SL	3	16
367	MACK	SL	2	20
368	MACK	SL	1	12
369	FAJADA	SL	1	4
370	FAJADA	LS	3	4
371	BACOB	SL	2	25
372	MAYQUEEN	LS	2	33
373	BACOB	LS	1	14
374	MAYQUEEN	LS	1	22
375	GRIETA	SL	1	8
376	MONIERCO	SCL	2	5
377	BACOB	SCL	1	12
378	UFFINS	SCL	1	0
379	HOSKEY	CL	1	0
380	PATEL	CL	1	0
381	BENALLY	SCL	1	0

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
382	GRIETA	SL	5	22
383	MACK	SL	3	19
384	GRIETA	SL	2	14
385	FAJATA	SCL	3	4
386	MAYQUEEN	LS	3	22
387	GRIETA	SL	3	14
388	BACOB	SL	2	22
389	BACOB	LS	2	16
390	BACOB	LS	2	14
391	REDLANDS VARIANT	SL	2	15
392	REDLANDS VARIANT	SL	1	18
393	MONIERCO	SL	3	11
394	PERSAYO	SCL	8	4
395	BACOB	SCL	2	16
396	BACOB	SCL	1	14
397	FAJADA	SL	3	6
398	REDLANDS VARIANT	SL	2	43
399	BACOB	LS	1	16
400	MONIERCO	SL	3	10
401	RAZITO	S	3	49
402	REDLANDS VARIANT	SL	1	8
403	MONIERCO	SL	1	12
404	REDLANDS VARIANT	LS	1	20
405	FAJADA	CL	3	6
406	BENALLY	SCL	1	0
407	HOSKEY	CL	0	0
408	HUERFANO	CL	0	0
409	HUERFANO	CL	0	0
410	HUERFANO	CL	0	0
411	HUERFANO	CL	0	0
412	HOSKEY	CL	0	0
413	FAJADA	SCL	1	4
414	FAJADA	SL	3	4
415	PATEL	SL	4	8
416	GRIETA	SL	4	6
417	SHIPROCK VARIANT	SL	1	17
418	SHIPROCK	LS	1	67
419	BENALLY	SL	3	4

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
420	FAJADA	SCL	5	5
421	FAJADA	LS	5	4
422	FAJADA	SL	4	4
423	FAJADA	SL	3	5
424	BENALLY	SL	1	7
425	MACK	SL	1	5
426	HUERFANO	SL	3	4
427	BENALLY	SCL	3	4
428	PATEL	C	2	0
429	HUERFANO	C	1	0
430	HUERFANO	CL	3	0
431	BACOBI	SCL	3	30
432	BENALLY	SCL	3	6
433	FAJADA	SCL	4	10
434	FAJADA	SL	4	18
435	FAJADA	SL	2	10
436	MAYQUEEN	LS	3	31
437	REDLANDS VARIANT	SL	1	4
438	SHIPROCK	SL	1	14
439	SHIPROCK	SL	1	20
440	SHIPROCK	SL	1	24
441	BACOBI	SL	3	25
442	MONIERCO	SL	3	8
443	SHIPROCK	LS	1	20
444	SHIPROCK	LS	1	24
445	BACOBI	SL	2	10
446	BACOBI	SL	2	17
447	SHIPROCK	LS	2	20
448	FAJADA	LS	3	16
449	SHIPROCK	LS	3	59
450	MAYQUEEN	LS	2	49
451	MAYQUEEN	LS	1	47
452	BACOBI	SL	1	24
453	BACOBI	SL	2	6
454	BACOBI	SL	1	4
455	MONIERCO	SL	1	6
456	SHIPROCK	LS	2	8
457	MAYQUEEN	S	3	20

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
458	REDLANDS VARIANT	SL	1	6
459	MONIERCO	LS	4	15
460	SHIPROCK	LS	5	39
461	BACOB I	LS	8	6
462	FARB	SL	5	4
463	HUERFANO	LS	5	4
464	BACOB I	LS	2	10
465	BACOB I	LS	1	12
466	SHIPROCK VARIANT	SL	2	31
467	MAYQUEEN	LS	2	75
468	FAJADA	S	2	16
469	BACOB I	SL	2	6
470	PERSAYO	CL	3	0
471	NAKAI	SL	3	18
472	BENALLY	SL	12	8
473	BACOB I	SL	8	28
474	HUERFANO	LS	10	4
475	HUERFANO	C	10	0
476	BACOB I	SL	5	14
477	PATEL	LS	5	13
478	WINGROCK	SL	3	14
479	WINGROCK	LS	2	28
480	WINGROCK	SL	3	15
481	BACOB I	SCL	3	5
482	BACOB I	SL	3	13
483	FARB	SL	3	6
484	BENALLY	LS	2	10
485	RAZITO	S	2	10
486	RAZITO	SL	1	4
487	TRAIL	S	0	0
488	JOCITY	CL	0	0
489	FAJADA	SL	0	6
490	HUERFANO	SCL	0	0
491	PATEL	C	1	0
492	HUERFANO	CL	1	0
493	MAYQUEEN	S	7	79
494	RAZITO	LS	7	49
495	RAZITO	S	9	83

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
496	FARB	S	5	8
497	FARB	S	1	8
498	WINGROCK	SL	1	20
499	BACOB	SL	1	4
500	MONIERCO	SL	2	8
501	MONIERCO	SL	2	8
502	RAZITO	S	7	79
503	RAZITO	S	9	35
504	TRAIL	LS	1	6
505	BENALLY	LS	1	4
506	FAJADA	LS	0	4
507	BACOB	SL	1	5
508	FARB	SL	1	6
509	FARB	LS	2	4
510	HUERFANO	SL	2	5
511	HOSKEY	CL	3	0
512	HOSKEY	CL	1	0
513	HOSKEY	CL	1	0
514	FAJADA	SCL	1	0
515	HUERFANO	CL	1	0
516	HUERFANO	CL	1	0
517	HUERFANO	SCL	1	0
518	FAJADA	SCL	1	0
519	HUERFANO	SL	2	0
520	HUERFANO	CL	1	0
521	HUERFANO	SCL	2	0
522	HUERFANO	CL	15	0
523	FARB	SL	3	4
524	PERSAYO	SCL	3	0
525	FARB	SL	2	8
526	FARB	SL	5	0
527	HUERFANO	C	4	0
528	PATEL	VGSL	2	0
529	HUERFANO	CL	1	0
530	HUERFANO	C	2	0
531	HUERFANO	CL	7	0
532	HUERFANO	SCL	5	0
533	SHIPROCK	LS	3	18

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
534	BACOB	LS	3	8
535	FARB	SL	3	6
536	HUERFANO	SL	3	0
537	HUERFANO	C	1	0
538	CHIPETA	C	5	0
539	HUERFANO	SCL	3	0
540	PERSAYO	CL	3	4
541	PATEL	SL	3	20
542	PATEL	SL	2	4
543	CHIPETA	CL	3	0
544	MONERICO	SL	3	8
545	WINGROCK	LS	1	8
546	MONIERCO	SL	2	5
547	FAJADA	SCL	3	0
548	REDLANDS VARIANT	SL	2	8
549	REDLANDS VARIANT	LS	2	14
550	RAZITO	S	2	30
551	RAZITO	S	5	20
552	MAYQUEEN	S	3	33
553	PATEL	CL	0	0
554	HUERFANO	SL	5	0
555	HUERFANO	C	0	0
556	HUERFANO	C	1	0
557	TSAYA	SL	3	4
558	PERSAYO	CL	5	0
559	MONIERCO	SL	5	5
560	BACOB	LS	2	6
561	MAYQUEEN	LS	3	26
562	REDLANDS VARIANT	LS	3	8
563	SHIPROCK	LS	2	10
564	REDLANDS VARIANT	LS	2	12
565	CHIPETA	C	3	0
566	RAZITO	S	10	28
567	MONIERCO	SL	1	6
568	PATEL	C	5	0
569	TSAYA	SL	8	4
570	CHIPETA	C	3	0
571	HUERFANO	CL	3	0

TABLE 8-C-19. Sample characteristics of the Nakai soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	152	NAKAI	SL	5	4
I	163	NAKAI	SL	4	6
IV	49	NAKAI	SL	9	33
IV	262	NAKAI	SL	6	16
IV	273	NAKAI	SL	4	8
IV	274	NAKAI	SL	10	14
IV	279	NAKAI	SL	3	22
IV	284	NAKAI	SL	3	12
IV	286	NAKAI	SL	5	6
IV	290	NAKAI	SL	4	22
IV	471	NAKAI	SL	3	18

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
610	RAZITO	S	5	79
611	RAZITO	S	8	31
612	RAZITO	S	5	28
613	PATEL	S	3	12
614	HUERFANO	SCL	2	0
615	RAZITO	S	3	35
616	FAJADA	S	3	20
617	MONIERCO	LS	3	20
618	SHIPROCK	LS	3	18
619	SHIPROCK	LS	1	4
620	SHIPROCK	LS	3	20
621	HUERFANO	C	10	0
622	HUERFANO	C	9	0
623	HUERFANO	C	3	0
624	HUERFANO	SCL	1	0
625	RAZITO	S	3	18
626	PATEL	S	1	0
627	HUERFANO	C	1	0
628	STUMBLE	S	5	10
629	RAZITO	S	4	30
630	HUERFANO	C	1	0
631	HUERFANO	SL	1	0
632	RAZITO	S	3	24
633	RAZITO	S	12	10
634	RAZITO	S	12	24
635	BENALLY	SCL	5	0
636	BENALLY	LS	5	6
637	FAJADA	LS	5	10
638	BACOB I	LS	5	8
639	PATEL	S	3	8
640	BENALLY	SL	2	6
641	HUERFANO	C	0	0
642	HUERFANO	CL	1	0
643	HUERFANO	C	1	0
644	HUERFANO	CL	2	0
645	HUERFANO	CL	3	0
646	HUERFANO	CL	3	0
647	PATEL	LS	3	8

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
648	RAZITO	S	3	12
649	FAJADA	LS	2	4
650	BENALLY	LS	1	0
651	BENALLY	LS	1	0
652	BENALLY	S	1	14
653	UFFENS	S	1	10
654	UFFENS	SCL	1	0
655	UFFENS	S	2	20
656	BENALLY	S	2	10
657	UFFENS	S	2	8
658	BENALLY	S	2	12
659	RAZITO	S	1	24
660	HUERFANO	C	1	0
661	HUERFANO	CL	1	0
662	FAJADA	S	0	0
663	HUERFANO	CL	0	0
664	FAJADA	CL	1	0
665	RAZITO	S	1	0
666	RAZITO	S	2	16
667	BENALLY	S	2	0
668	RAZITO	S	2	8
669	RAZITO	S	1	0
670	BENALLY	LS	1	0
671	RAZITO	S	1	8
672	BENALLY	S	5	12
673	BENALLY	S	1	8
674	RAZITO	S	3	10
675	FAJADA	CL	3	0
676	HUERFANO	SL	3	0
677	HUERFANO	C	2	0
678	HUERFANO	C	3	0
679	HUERFANO	C	5	0
680	HUERFANO	C	3	0
681	HUERFANO	C	3	0
682	HUERFANO	C	5	0
683	FAJADA	CL	1	0
684	FAJADA	CL	0	0
685	BENALLY	CL	0	0

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
686	BENALLY	S	1	4
687	BENALLY	S	2	8
688	BENALLY	S	2	4
689	BENALLY	S	2	0
690	BENALLY	GSL	3	0
691	BENALLY	S	3	0
692	HUERFANO	SCL	2	0
693	HUERFANO	SCL	2	0
694	HUERFANO	CL	2	0
695	HUERFANO	SCL	3	0
696	HUERFANO	CL	2	0
697	HUERFANO	C	2	0
698	FAJADA	CL	2	0
699	FAJADA	GSL	2	0
700	FAJADA	CL	1	0
701	RAZITO	SL	1	0
702	GILCO	SL	1	35
703	RAZITO	S	8	45
704	RAZITO	S	8	59
705	STUMBLE	S	10	83
706	BENALLY	CL	2	0
707	BENALLY	SCL	2	0
708	HUERFANO	C	2	0
709	FAJADA	SCL	2	0
710	BENALLY	SL	1	0
711	JOCITY	SL	2	12
712	JOCITY	SL	4	14
713	JOCITY	SL	2	8
714	RAZITO	LS	3	8
715	RAZITO	S	3	17
716	RAZITO	S	3	20
717	PATEL	GSL	1	0
718	HUERFANO	C	1	0
719	JOCITY	SL	1	0
720	JOCITY	CL	1	0
721	BENALLY	CL	1	0
722	HUERFANO	SCL	3	0
723	HUERFANO	SL	3	4

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
724	FAJADA	S	3	8
725	JOCITY	SL	1	4
726	JOCITY	SCL	1	0
727	JOCITY	LS	1	0
728	JOCITY	SCL	1	0
729	HOSKEY	CL	1	0
730	UFFENS	CL	1	0
731	PATEL	C	1	0
732	FAJADA	CL	1	0
733	HUERFANO	CL	1	0
734	TSAYA	GSCL	2	0
735	HUERFANO	SCL	3	0
736	HUERFANO	CL	1	0
737	PATEL	CL	2	0
738	FAJADA	SCL	2	0
739	HUERFANO	C	2	0
740	HUERFANO	C	2	0
741	HUERFANO	C	2	0
742	PATEL	LS	3	7
743	GILCO	SCL	1	0
744	PATEL	S	1	9
745	HUERFANO	CL	1	0
746	HUERFANO	C	1	0
747	HUERFANO	CL	1	0
748	BENALLY	SCL	1	0
749	GILCO	SL	1	0
750	BENALLY	S	3	6
751	GILCO	SL	1	0
752	RAZITO	S	3	6
753	UFFENS	SCL	1	0
754	GILCO	CL	1	0
755	BENALLY	SL	1	0
756	BENALLY	CL	3	0
757	RAZITO	SL	5	0
758	HUERFANO	CL	2	0
759	HUERFANO	CL	1	0
760	HUERFANO	C	3	0
761	PATEL	SL	3	8

TABLE 8-B-5 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
762	TRAIL	LS	3	6
763	TRAIL	LS	3	4
764	TRAIL	SL	3	10
765	PATEL	LS	3	6
766	HUERFANO	C	2	0
767	HUERFANO	SCL	2	0
768	BENALLY	CL	1	0
769	JOCITY	SCL	1	0
770	GILCO	SL	1	0

TABLE 8-B-6. Soil sample characteristics in Area EQ 5/6.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	PERSAYO	CL	2	0
2	HUERFANO	SCL	4	0
3	RAZITO	LS	9	79
4	HUERFANO	SCL	2	0
5	MONIERCO	SL	2	6
6	MONIERCO	SL	7	6
7	MONIERCO	SL	5	10
8	BACOB I	SL	5	8
9	GRIETA	LS	5	33
10	AVALON	LS	5	15
11	AVALON	LS	4	18
12	MONIERCO	SL	6	10
13	MONIERCO	SL	4	0
14	MONIERCO	SL	8	4
15	BACOB I	VGSL	20	12

TABLE 8-B-7. Soil sample characteristics in Area EQ 7/8.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	RAZITO	SL	18	79
2	RAZITO	SL	16	69
3	SHIPROCK	SL	18	79
4	STUMBLE	S	7	79
5	SHIPROCK	SL	14	79
6	SHIPROCK	SL	5	79
7	SHIPROCK	SL	3	79
8	SHIPROCK	SL	7	69
9	SHIPROCK	SL	2	49
10	REDLANDS VARIANT	SL	4	53
11	SHIPROCK VARIANT	SL	2	89
12	SHIPROCK	SL	2	79
13	SHIPROCK	SL	2	79
14	SHIPROCK	SL	2	79
15	RAZITO	LS	2	83
16	RAZITO	LS	2	79
17	TRAIL	SL	3	79
18	SHIPROCK	SL	2	79
19	REDLANDS VARIANT	SL	1	30
20	SHIPROCK	LS	1	71
21	SHIPROCK	LS	1	45
22	SHIPROCK	LS	1	10
23	SHIPROCK	LS	1	20
24	RAZITO	S	5	61
25	SHIPROCK	LS	1	20
26	REDLANDS VARIANT	LS	1	12
27	REDLANDS VARIANT	LS	1	24

TABLE 8-B-8. Soil sample characteristics in Area EQ 9.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	SHIPROCK	LS	4	55
2	MAYQUEEN	S	5	79
3	BACOB	LS	2	16
4	BACOB	LS	5	33
5	FARB	LS	3	8
6	GRIETA	LS	5	26
7	MAYQUEEN	S	8	83
8	SHIPROCK	SL	1	39
9	MAYQUEEN	S	4	49
10	MONIERCO	SL	2	13
11	MAYQUEEN	S	1	49
12	SHIPROCK VARIANT	LS	4	24
13	MONIERCO	SL	3	12
14	FARB	LS	8	6
15	WINGROCK	LS	6	43
16	BACOB	SL	5	16
17	STUMBLE	S	4	43
18	STUMBLE	S	5	79
19	RAZITO	S	7	98
20	RAZITO	S	11	98
21	RAZITO	S	7	98
22	JOCITY	CL	5	0
23	BENALLY	CL	1	0
24	JOCITY	GSL	1	0
25	MAYQUEEN	LS	1	89
26	SHIPROCK	LS	1	59
27	FAJADA	S	1	16
28	GILCO	S	1	84
29	PATEL	C	4	0
30	GILCO	S	1	47
31	GILCO	S	3	47
32	GILCO	S	3	51
33	FAJADA	SL	2	8
34	BENALLY	SCL	1	0
35	FAJADA	SL	2	8
36	BENALLY	LS	1	8
37	GILCO	LS	0	39
38	GILCO	S	2	84

TABLE 8-B-8 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
39	JOCITY	SL	2	43
40	FAJADA	CL	3	0
41	BENALLY	CL	2	0
42	JOCITY	LS	1	22
43	GILCO	CL	1	53
44	GILCO	CL	1	49
45	BENALLY	CL	1	0
46	GILCO	CL	1	67
47	JOCITY	LS	3	79
48	GILCO	LS	1	79
49	HUERFANO	CL	3	0
50	BENALLY	GSL	6	0
51	FAJADA	CL	4	0
52	RAZITO	S	8	94
53	RAZITO	S	7	79
54	JOCITY	LS	2	90
55	JOCITY	SL	1	90
56	JOCITY	CL	2	89
57	JOCITY	CL	2	79
58	JOCITY	CL	2	79
59	JOCITY	CL	1	79
60	BENALLY	CL	1	0
61	BENALLY	CL	1	0
62	JOCITY	SCL	1	79
63	JOCITY	CL	1	0
64	BENALLY	CL	0	0
65	JOCITY	CL	1	0
66	BENALLY	CL	1	0
67	JOCITY	SCL	1	79
68	JOCITY	L	4	75
69	JOCITY	L	3	79
70	JOCITY	CL	1	0
71	BENALLY	CL	1	0
72	BENALLY	CL	2	0
73	JOCITY	CL	1	0
74	JOCITY	CL	1	0
75	JOCITY	CL	0	0
76	JOCITY	SCL	1	0

TABLE 8-B-8 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
77	JOCITY	L	0	0
78	JOCITY	CL	1	0
79	JOCITY	SL	1	0
80	JOCITY	CL	1	0
81	JOCITY	CL	1	0
82	GILCO	SCL	1	0
83	JOCITY	CL	1	0
84	JOCITY	CL	1	0
85	JOCITY	SCL	1	0
86	JOCITY	SL	1	0
87	JOCITY	SL	1	0
88	JOCITY	SCL	1	0
89	JOCITY	CL	1	0
90	JOCITY	CL	1	0
91	JOCITY	SCL	0	0
92	JOCITY	CL	0	0
93	JOCITY	CL	0	0
94	JOCITY	CL	1	0
95	JOCITY	CL	1	0
96	JOCITY	CL	1	0
97	JOCITY	CL	1	0
98	JOCITY	CL	1	0
99	JOCITY	CL	4	33
100	JOCITY	GSL	3	79
101	JOCITY	GSL	3	89
106	RAZITO	LS	5	24
107	RAZITO	SL	1	16
108	RAZITO	LS	15	13
109	RAZITO	SL	10	12

TABLE 8-B-9. Soil sample characteristics in Area EQ 10.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	MAYQUEEN	LS	3	63
2	MAYQUEEN	S	3	41
3	MAYQUEEN	S	4	31
4	BACOBI	LS	2	31
5	HUERFANO	LS	3	8
6	MONIERCO	LS	2	12
7	RAZITO	S	2	20
8	BACOBI	LS	3	24
9	BACOBI	LS	4	18
10	SHIPROCK VARIANT	LS	3	30

TABLE 8-B-10. Soil sample characteristics in Area EQ 11/12.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	GILCO	SL	1	84
2	BENALLY	SCL	1	0
3	RAZITO	S	7	24
4	FARB	S	4	0
5	FARB	LS	4	12
6	RAZITO	S	5	59
7	FARB	S	2	10
8	RAZITO	SL	4	55
9	JOCITY	CL	1	6
10	GILCO	SL	1	8
11	RAZITO	SL	13	59
12	GILCO	SCL	4	24
13	JOCITY	CL	2	31
14	JOCITY	CL	2	43
15	JOCITY	CL	0	75
16	JOCITY	SL	1	59
17	JOCITY	CL	1	83
18	JOCITY	CL	1	24
19	HOSKEY	C	1	0

TABLE 8-B-11. Soil sample characteristics in Area EQ 13.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	HUERFANO	C	2	0
2	HUERFANO	CL	1	0
3	PATEL	C	5	0
4	HUERFANO	CL	2	0
5	TRAIL	SL	8	26
6	HUERFANO	CL	3	0
7	HUERFANO	CL	5	0
8	HUERFANO	CL	4	0
9	HUERFANO	VGSL	2	0
10	HUERFANO	GSCL	2	0
11	HUERFANO	CL	4	0
12	HUERFANO	CL	3	0
13	MAYQUEEN	LS	1	39
14	SHIPROCK	SL	1	79
15	SHIPROCK	SL	2	43
16	HUERFANO	SCL	5	0
17	REDLANDS VARIANT	LS	3	49
18	HUERFANO	CL	2	0

TABLE 8-B-12. Soil sample characteristics in Area EQ 15.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	SHIPROCK	LS	0	79
2	SHIPROCK	SL	2	79
3	MAYQUEEN	LS	7	41
4	MAYQUEEN	LS	4	79
5	MAYQUEEN	LS	4	79
6	SHIPROCK	LS	2	25
7	SHIPROCK	LS	1	50
8	MAYQUEEN	LS	2	79
9	SHIPROCK	LS	2	79
10	SHIPROCK	LS	1	79
11	SHIPROCK VARIANT	LS	4	54
12	SHIPROCK	LS	4	79
13	MAYQUEEN	LS	1	49
14	MAYQUEEN	SL	5	17
14	SHIPROCK	LS	2	49
15	MAYQUEEN	LS	1	45
16	MAYQUEEN	LS	1	37
17	FAJADA	S	5	10
18	SHIPROCK	LS	2	67
19	SHIPROCK	LS	3	47
20	SHIPROCK	SL	4	20
21	SHIPROCK	LS	3	4
22	SHIPROCK	LS	4	57
23	SHIPROCK	LS	2	71
24	HUERFANO	CL	5	0
25	MAYQUEEN	LS	5	15
26	MAYQUEEN	LS	8	18
27	FRUITLAND	GSCL	5	39
28	JOCITY	SL	2	79
29	JOCITY	SL	3	4
30	GILCO	SL	3	14
31	GILCO	LS	4	6
32	JOCITY	SL	3	0
33	RAZITO	S	5	51
34	RAZITO	S	9	47
35	RAZITO	S	15	79
36	STUMBLE	S	12	4
37	BENALLY	SCL	10	0

TABLE 8-B-12 (cont)

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
38	TRAIL	S	11	67
39	TRAIL	S	5	79
40	TRAIL	S	10	79
41	TRAIL	S	7	79
42	HUERFANO	CL	5	0
43	TRAIL	S	10	12
44	TRAIL	S	13	8
45	TRAIL	S	10	78
46	TRAIL	S	10	94
47	TRAIL	SCL	5	0
48	TRAIL	S	6	8
49	TRAIL	S	5	24
50	TRAIL	LS	7	94
51	TRAIL	LS	8	79
52	TRAIL	LS	6	12
53	TRAIL	LS	7	18
54	TRAIL	LS	8	16
55	TRAIL	LS	5	0
56	TRAIL	S	3	20
57	TRAIL	LS	3	79
58	MAYQUEEN	LS	1	49
59	HUERFANO	LS	1	5
60	TRAIL	S	1	75
61	TRAIL	LS	2	89
62	TRAIL	LS	2	79
63	TRAIL	LS	4	16
64	JOCITY	GSL	2	0
65	TRAIL	LS	3	28
66	TRAIL	S	3	16
67	TRAIL	CL	4	0
68	TRAIL	LS	1	35
69	BENALLY	SCL	1	0
70	PATEL	S	2	0
71	UFFENS	SCL	4	0
72	PATEL	C	1	0
73	TRAIL	SL	2	10

TABLE 8-B-13. Soil sample characteristics in Area EQ 25.

Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
1	REDLANDS VARIANT	LS	3	49
2	HUERFANO	CL	2	0
3	FAJADA	LS	2	12
4	BACOB	SL	4	26
5	MONIERCO	LS	4	14
6	MONIERCO	SL	4	10
7	SHIPROCK	SL	5	69
8	BACOB	LS	4	18
9	MONIERCO	SL	3	8
10	FARB	LS	2	12
11	BACOB	LS	4	14
12	SHIPROCK	LS	6	572
13	BACOB	LS	4	35
14	MONIERCO	LS	7	18
15	BACOB	LS	6	34
16	HUERFANO	SCL	6	0
17	HUERFANO	CL	6	0
18	FARB	SL	5	0
19	FARB	LS	7	6
20	HUERFANO	SCL	4	0
21	FARB	LS	7	4
22	FARB	LS	4	16
23	FARB	LS	6	12
24	SHIPROCK	LS	5	71
25	SHIPROCK	LS	4	41
26	SHIPROCK	LS	2	51
27	REDLANDS VARIANT	LS	4	40
28	REDLANDS VARIANT	LS	4	49
29	REDLANDS VARIANT	LS	3	39
30	DOAK	LS	1	53

APPENDIX 8-C

SAMPLE CHARACTERISTICS OF THE SOIL SERIES.

Table	Series Name
TABLE 8-C-1	Avalon
TABLE 8-C-2	Bacobi
TABLE 8-C-3	Badlands
TABLE 8-C-4	Benally
TABLE 8-C-5	Blancot
TABLE 8-C-6	Chipeta
TABLE 8-C-7	Doak
TABLE 8-C-8	Fajada
TABLE 8-C-9	Farb
TABLE 8-C-10	Fruitland
TABLE 8-C-11	Gilco
TABLE 8-C-12	Grieta
TABLE 8-C-13	Hoskey
TABLE 8-C-14	Huerfano
TABLE 8-C-15	Jocity
TABLE 8-C-16	Mack
TABLE 8-C-17	Mayqueen
TABLE 8-C-18	Monierco
TABLE 8-C-19	Nakai
TABLE 8-C-20	Patel
TABLE 8-C-21	Persayo
TABLE 8-C-22	Razito
TABLE 8-C-23	Redlands Variant
TABLE 8-C-24	Shiprock
TABLE 8-C-25	Shiprock Variant
TABLE 8-C-26	Stumble
TABLE 8-C-27	Trail
TABLE 8-C-28	Tsaya
TABLE 8-C-29	Uffens
TABLE 8-C-30	Wingrock

TABLE 8-C-1. Sample characteristics of the Avalon soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	453	AVALON	SL	1	16
IV	11	AVALON	SL	1	31
IV	17	AVALON	SL	2	22
IV	20	AVALON	SL	4	23
IV	30	AVALON	SL	2.5	20
IV	31	AVALON	SL	2.5	20
IV	83	AVALON	SL	4.5	26
IV	107	AVALON	SL	5	11
EQ5/6	10	AVALON	LS	5	15
EQ5/6	11	AVALON	LS	4	18

TABLE 8-C-2. Sample characteristics of the Bacobi soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	154	BACOBI	SL	1	22
I	155	BACOBI	SL	2	22
I	164	BACOBI	SL	6	17
I	169	BACOBI	SL	2	14
I	170	BACOBI	SL	4	12
III	24	BACOBI	SL	2	24
III	28	BACOBI	SL	2	31
III	29	BACOBI	SL	2	30
III	32	BACOBI	SL	2	12
III	33	BACOBI	SL	2	11
III	34	BACOBI	SCL	1.5	18
III	37	BACOBI	SL	4	36
III	38	BACOBI	LS	4	48
III	149	BACOBI	SL	2.5	25
III	393	BACOBI	SL	2	23
III	395	BACOBI	SL	1	21
III	399	BACOBI	SCL	0.5	33
III	400	BACOBI	SCL	0.5	24
III	427	BACOBI	SL	1.5	22
III	429	BACOBI	SL	2	33
III	446	BACOBI	SL	1	28
III	447	BACOBI	LS	1	17
III	448	BACOBI	SL	1	14
III	451	BACOBI	SL	1	19
III	452	BACOBI	SL	1	13
IV	5	BACOBI	SL	1	19
IV	12	BACOBI	SL	1	22
IV	13	BACOBI	SL	1	4
IV	16	BACOBI	SL	4	20
IV	19	BACOBI	SL	1	15
IV	21	BACOBI	SL	3	19
IV	29	BACOBI	SL	1.5	20
IV	38	BACOBI	SL	2	30
IV	40	BACOBI	SL	3.5	19
IV	41	BACOBI	SL	4	15
IV	43	BACOBI	SL	1	25
IV	44	BACOBI	SL	1.5	19
IV	60	BACOBI	SL	1.5	17

TABLE 8-C-2 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	61	BACOBI	SL	2	36
IV	69	BACOBI	SL	0.5	23
IV	71	BACOBI	SL	1.5	18
IV	72	BACOBI	SL	2.5	33
IV	73	BACOBI	SL	5	31
IV	76	BACOBI	LS	1	30
IV	77	BACOBI	LS	1	22
IV	117	BACOBI	SL	2	31
IV	125	BACOBI	SL	1	20
IV	126	BACOBI	SL	2	22
IV	128	BACOBI	SCL	2	32
IV	142	BACOBI	SL	3	8
IV	143	BACOBI	SL	6	11
IV	150	BACOBI	SCL	0.5	13
IV	170	BACOBI	SL	3.5	14
IV	183	BACOBI	SL	1	7
IV	190	BACOBI	SL	1	22
IV	192	BACOBI	SL	5	17
IV	198	BACOBI	SL	0.5	17
IV	200	BACOBI	SL	1.5	28
IV	209	BACOBI	SL	5	25
IV	250	BACOBI	LS	3	28
IV	281	BACOBI	SL	5	17
IV	309	BACOBI	LS	3	13
IV	310	BACOBI	LS	4	26
IV	318	BACOBI	SL	3	24
IV	321	BACOBI	SL	2	12
IV	322	BACOBI	SL	1	18
IV	337	BACOBI	SL	2	13
IV	338	BACOBI	SL	3	7
IV	339	BACOBI	SL	4	8
IV	343	BACOBI	SL	3	4
IV	352	BACOBI	SL	4	12
IV	357	BACOBI	SL	2	16
IV	371	BACOBI	SL	2	25
IV	373	BACOBI	LS	1	14
IV	377	BACOBI	SCL	1	12
IV	388	BACOBI	SL	2	22

TABLE 8-C-2 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	389	BACOBI	LS	2	16
IV	390	BACOBI	LS	2	14
IV	395	BACOBI	SCL	2	16
IV	396	BACOBI	SCL	1	14
IV	399	BACOBI	LS	1	16
IV	431	BACOBI	SCL	3	30
IV	441	BACOBI	SL	3	25
IV	445	BACOBI	SL	2	10
IV	446	BACOBI	SL	2	17
IV	452	BACOBI	SL	1	24
IV	453	BACOBI	SL	2	6
IV	454	BACOBI	SL	1	4
IV	461	BACOBI	LS	8	6
IV	464	BACOBI	LS	2	10
IV	465	BACOBI	LS	1	12
IV	469	BACOBI	SL	2	6
IV	473	BACOBI	SL	8	28
IV	476	BACOBI	SL	5	14
IV	481	BACOBI	SCL	3	5
IV	482	BACOBI	SL	3	13
IV	499	BACOBI	SL	1	4
IV	507	BACOBI	SL	1	5
IV	534	BACOBI	LS	3	8
IV	560	BACOBI	LS	2	6
IV	609	BACOBI	LS	4	20
IV	638	BACOBI	LS	5	8
EQ5/6	8	BACOBI	SL	5	8
EQ5/6	15	BACOBI	VGSL	20	12
EQ9	3	BACOBI	LS	2	16
EQ9	4	BACOBI	LS	5	33
EQ9	16	BACOBI	SL	5	16
EQ10	4	BACOBI	LS	2	31
EQ10	8	BACOBI	LS	3	24
EQ10	9	BACOBI	LS	4	18
EQ25	4	BACOBI	SL	4	26
EQ25	8	BACOBI	LS	4	18
EQ25	11	BACOBI	LS	4	14
EQ25	13	BACOBI	LS	4	35

TABLE 8-C-2 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
EQ25	15	BACOBI	LS	6	34
BLOCK B	17	BACOBI	CL	1	4
BLOCK B	48	BACOBI	LS	2	14
BLOCK B	84	BACOBI	LS	1	18
BLOCK B	85	BACOBI	S	1	30
BLOCK B	110	BACOBI	LS	2	24
BLOCK B	121	BACOBI	LS	1	24
BLOCK B	122	BACOBI	LS	2	26
BLOCK B	123	BACOBI	LS	1	30
BLOCK B	124	BACOBI	LS	1	20
BLOCK B	126	BACOBI	LS	2	17
BLOCK B	131	BACOBI	SL	2	24
BLOCK B	132	BACOBI	LFS	1	21
BLOCK B	134	BACOBI	SL	1	37
BLOCK B	136	BACOBI	LS	2	23

TABLE 8-C-3. Sample characteristics of the Badland soils series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
BLOCK B	31	BADLANDS	C	5	0
BLOCK B	102	BADLANDS	C	2	0

TABLE 8-C-4. Sample characteristics of the Benally soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	254	BENALLY	SCL	2	0
IV	255	BENALLY	SCL	2	0
IV	256	BENALLY	SCL	2	0
IV	257	BENALLY	SCL	2	0
IV	264	BENALLY	SL	3	5
IV	269	BENALLY	CL	2	0
IV	271	BENALLY	CL	1	0
IV	302	BENALLY	CL	1	0
IV	303	BENALLY	CL	1	0
IV	305	BENALLY	SL	1	4
IV	341	BENALLY	S	7	8
IV	351	BENALLY	SL	6	6
IV	364	BENALLY	SL	2	4
IV	381	BENALLY	SCL	1	0
IV	406	BENALLY	SCL	1	0
IV	419	BENALLY	SL	3	4
IV	424	BENALLY	SL	1	7
IV	427	BENALLY	SCL	3	4
IV	432	BENALLY	SCL	3	6
IV	472	BENALLY	SL	12	8
IV	484	BENALLY	LS	2	10
IV	505	BENALLY	LS	1	4
IV	635	BENALLY	SCL	5	0
IV	636	BENALLY	LS	5	6
IV	640	BENALLY	SL	2	6
IV	650	BENALLY	LS	1	0
IV	651	BENALLY	LS	1	0
IV	652	BENALLY	S	1	14
IV	656	BENALLY	S	2	10
IV	658	BENALLY	S	2	12
IV	667	BENALLY	S	2	0
IV	670	BENALLY	LS	1	0
IV	672	BENALLY	S	5	12
IV	673	BENALLY	S	1	8
IV	685	BENALLY	CL	0	0
IV	686	BENALLY	S	1	4
IV	687	BENALLY	S	2	8
IV	688	BENALLY	S	2	4

TABLE 8-C-4 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	689	BENALLY	S	2	0
IV	690	BENALLY	GSL	3	0
IV	691	BENALLY	S	3	0
IV	706	BENALLY	CL	2	0
IV	707	BENALLY	SCL	2	0
IV	710	BENALLY	SL	1	0
IV	721	BENALLY	CL	1	0
IV	748	BENALLY	SCL	1	0
IV	750	BENALLY	S	3	6
IV	755	BENALLY	SL	1	0
IV	756	BENALLY	CL	3	0
IV	768	BENALLY	CL	1	0
EQ9	23	BENALLY	CL	1	0
EQ9	34	BENALLY	SCL	1	0
EQ9	36	BENALLY	LS	1	8
EQ9	41	BENALLY	CL	2	0
EQ9	45	BENALLY	CL	1	0
EQ9	50	BENALLY	GSL	6	0
EQ9	60	BENALLY	CL	1	0
EQ9	61	BENALLY	CL	1	0
EQ9	64	BENALLY	CL	0	0
EQ9	66	BENALLY	CL	1	0
EQ9	71	BENALLY	CL	1	0
EQ9	72	BENALLY	CL	2	0
EQ11/12	2	BENALLY	SCL	1	0
EQ15	37	BENALLY	SCL	10	0
EQ15	69	BENALLY	SCL	1	0
BLOCK B	6	BENALLY	CL	2	4
BLOCK B	49	BENALLY	LS	2	15
BLOCK B	63	BENALLY	LS	5	31
BLOCK B	64	BENALLY	LS	4	31
BLOCK B	101	BENALLY	S	3	3

TABLE 8-C-5. Sample characteristics of the Blancot soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	83	BLANCOT	SCL	2	20
I	95	BLANCOT	SCL	1	79
I	110	BLANCOT	SL	1	79
I	135	BLANCOT	SL	5	79
I	136	BLANCOT	SCL	1	31
II	19	BLANCOT	SCL	5	50
III	11	BLANCOT	CL	1	31
III	47	BLANCOT	SCL	1	35
III	48	BLANCOT	SCL	0.5	30
III	49	BLANCOT	SCL	0.5	28
III	104	BLANCOT	SL	5	22
III	105	BLANCOT	SL	1	79
III	106	BLANCOT	SL	1	79
III	110	BLANCOT	SL	6	37
III	113	BLANCOT	SL	1	91
III	114	BLANCOT	SL	4.5	91
III	139	BLANCOT	SL	0	32
III	144	BLANCOT	SL	3	18
III	146	BLANCOT	SCL	4.5	43
III	147	BLANCOT	SL	3	63
III	152	BLANCOT	SCL	1	33
III	154	BLANCOT	SCL	1	27
III	155	BLANCOT	SL	1	31
III	156	BLANCOT	SL	1	79
III	157	BLANCOT	SCL	1	79
III	205	BLANCOT	SL	1.5	43
III	232	BLANCOT	SCL	2	79
III	254	BLANCOT	SL	3	18
III	257	BLANCOT	SL	0	21
III	258	BLANCOT	SCL	0	13
III	259	BLANCOT	SL	0	31
III	260	BLANCOT	SL	1	44
III	265	BLANCOT	CL	0	11
III	266	BLANCOT	SCL	1	28
III	267	BLANCOT	SCL	2	29
III	269	BLANCOT	SCL	2.5	35
III	272	BLANCOT	SCL	0	19
III	273	BLANCOT	SL	0	22

TABLE 8-C-5 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	276	BLANCOT	SCL	1	18
III	277	BLANCOT	SCL	1	15
III	281	BLANCOT	SCL	0	26
III	282	BLANCOT	SCL	0	47
III	283	BLANCOT	SCL	10	11
III	284	BLANCOT	SCL	0	10
III	285	BLANCOT	SCL	0	13
III	286	BLANCOT	SCL	0	15
III	287	BLANCOT	SCL	0	11
III	288	BLANCOT	SCL	0	14
III	304	BLANCOT	SCL	0.5	67
III	307	BLANCOT	CL	0.5	20
III	338	BLANCOT	SCL	4	69

TABLE 8-C-6. Sample characteristics of the Chipeta soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	538	CHIPETA	C	5	0
IV	543	CHIPETA	CL	3	0
IV	565	CHIPETA	C	3	0
IV	570	CHIPETA	C	3	0
IV	587	CHIPETA	C	1	0
IV	588	CHIPETA	C	1	0

TABLE 8-C-7. Sample characteristics of the Doak soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
II	16	DOAK	SL	1	49
III	84	DOAK	SL	5	58
III	85	DOAK	SL	5	58
III	239	DOAK	SL	5	73
III	274	DOAK	SCL	1	36
III	311	DOAK	SL	7	39
III	312	DOAK	SL	0.5	39
III	313	DOAK	SCL	1	14
III	351	DOAK	SCL	2	68
III	388	DOAK	SL	0.5	25
III	389	DOAK	SL	0.5	31
IV	260	DOAK	SCL	4	7
EQ25	30	DOAK	LS	1	53

TABLE 8-C-8. Sample characteristics of the Fajada soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	20	FAJADA	SL	1	0
I	58	FAJADA	SL	0.5	0
I	78	FAJADA	SCL	0.5	0
I	124	FAJADA	CL	1.5	0
I	145	FAJADA	SCL	1.5	0
II	1	FAJADA	SCL	3.5	0
II	31	FAJADA	SCL	1.5	0
II	42	FAJADA	SL	5	0
II	43	FAJADA	SL	5	0
II	52	FAJADA	SCL	6	0
II	54	FAJADA	CL	0	0
II	55	FAJADA	CL	0.5	0
II	65	FAJADA	LS	1	11
III	42	FAJADA	CL	0.5	0
III	43	FAJADA	C	0.5	3
III	95	FAJADA	CL	3.5	0
III	102	FAJADA	SL	1	0
III	118	FAJADA	CL	1.5	0
III	123	FAJADA	CL	2	0
III	164	FAJADA	SCL	3	17
III	189	FAJADA	CL	4.5	0
III	224	FAJADA	SCL	8	0
III	241	FAJADA	SCL	1	0
III	247	FAJADA	CL	1	0
III	253	FAJADA	SL	2	8
III	268	FAJADA	SCL	1	0
III	361	FAJADA	C	0	0
III	433	FAJADA	LS	0	12
III	435	FAJADA	LS	1	12
III	436	FAJADA	SL	1	16
III	443	FAJADA	LS	2	13
III	444	FAJADA	LS	0.5	10
III	449	FAJADA	SCL	1	0
III	459	FAJADA	SCL	1	0
III	464	FAJADA	SL	2	0
III	465	FAJADA	SL	1	0
III	466	FAJADA	C	1	0
III	470	FAJADA	CL	1	0

TABLE 8-C-8 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	486	FAJADA	SCL	5	0
III	492	FAJADA	CL	0.5	0
III	499	FAJADA	SCL	5	0
IV	27	FAJADA	SCL	1	0
IV	96	FAJADA	SCL	2	0
IV	97	FAJADA	SCL	6	0
IV	178	FAJADA	SL	2	0
IV	180	FAJADA	SL	7	0
IV	224	FAJADA	SCL	1	0
IV	258	FAJADA	SCL	2	0
IV	259	FAJADA	SCL	3	0
IV	268	FAJADA	SCL	2	0
IV	278	FAJADA	SCL	1	0
IV	282	FAJADA	SL	1	4
IV	285	FAJADA	SL	2	4
IV	296	FAJADA	CL	4	0
IV	297	FAJADA	SL	3	5
IV	304	FAJADA	CL	1	0
IV	306	FAJADA	SL	3	10
IV	312	FAJADA	LS	3	6
IV	331	FAJADA	CL	1	0
IV	358	FAJADA	CL	1	0
IV	369	FAJADA	SL	1	4
IV	370	FAJADA	LS	3	4
IV	385	FAJATA	SCL	3	4
IV	397	FAJADA	SL	3	6
IV	405	FAJADA	CL	3	6
IV	413	FAJADA	SCL	1	4
IV	414	FAJADA	SL	3	4
IV	420	FAJADA	SCL	5	5
IV	421	FAJADA	LS	5	4
IV	422	FAJADA	SL	4	4
IV	423	FAJADA	SL	3	5
IV	433	FAJADA	SCL	4	10
IV	434	FAJADA	SL	4	18
IV	435	FAJADA	SL	2	10
IV	448	FAJADA	LS	3	16
IV	468	FAJADA	S	2	16

TABLE 8-C-8 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	489	FAJADA	SL	0	6
IV	506	FAJADA	LS	0	4
IV	514	FAJADA	SCL	1	0
IV	518	FAJADA	SCL	1	0
IV	547	FAJADA	SCL	3	0
IV	590	FAJADA	LS	5	12
IV	616	FAJADA	S	3	20
IV	637	FAJADA	LS	5	10
IV	649	FAJADA	LS	2	4
IV	662	FAJADA	S	0	0
IV	664	FAJADA	CL	1	0
IV	675	FAJADA	CL	3	0
IV	683	FAJADA	CL	1	0
IV	684	FAJADA	CL	0	0
IV	698	FAJADA	CL	2	0
IV	699	FAJADA	GSL	2	0
IV	700	FAJADA	CL	1	0
IV	709	FAJADA	SCL	2	0
IV	724	FAJADA	S	3	8
IV	732	FAJADA	CL	1	0
IV	738	FAJADA	SCL	2	0
EQ9	27	FAJADA	S	1	16
EQ9	33	FAJADA	SL	2	8
EQ9	35	FAJADA	SL	2	8
EQ9	40	FAJADA	CL	3	0
EQ9	51	FAJADA	CL	4	0
EQ15	17	FAJADA	S	5	10
EQ25	3	FAJADA	LS	2	12
BLOCK B	10	FAJADA	CL	2	6
BLOCK B	22	FAJADA	SL	3	4
BLOCK B	23	FAJADA	CL	2	9
BLOCK B	47	FAJADA	LS	2	10
BLOCK B	130	FAJADA	LS	3	15

TABLE 8-C-9. Sample characteristics of the Farb soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	160	FARB	SL	2	20
III	31	FARB	SL	3	9
III	61	FARB	SL	2	14
IV	32	FARB	SL	5	10
IV	34	FARB	SCL	3.5	5
IV	35	FARB	SCL	1	3
IV	36	FARB	SL	0.5	4
IV	55	FARB	SL	0.5	4
IV	106	FARB	SL	2.5	9
IV	112	FARB	SL	9	4
IV	114	FARB	SL	7	3
IV	118	FARB	SL	2	4
IV	121	FARB	SL	6	3
IV	122	FARB	SL	4	7
IV	123	FARB	SL	2	5
IV	124	FARB	SL	2	5
IV	129	FARB	SL	7	8
IV	144	FARB	SL	8	3
IV	146	FARB	SL	5	3
IV	147	FARB	SL	1	4
IV	151	FARB	SL	5	6
IV	153	FARB	SL	6	4
IV	159	FARB	SL	1	5
IV	171	FARB	SL	7	6
IV	193	FARB	SL	2	2
IV	307	FARB	SL	5	4
IV	349	FARB	LS	20	12
IV	462	FARB	SL	5	4
IV	483	FARB	SL	3	6
IV	496	FARB	S	5	8
IV	497	FARB	S	1	8
IV	508	FARB	SL	1	6
IV	509	FARB	LS	2	4
IV	523	FARB	SL	3	4
IV	525	FARB	SL	2	8
IV	526	FARB	SL	5	0
IV	535	FARB	SL	3	6
EQ9	5	FARB	LS	3	8

TABLE 8-C-9 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
EQ9	14	FARB	LS	8	6
EQ11/12	4	FARB	S	4	0
EQ11/12	5	FARB	LS	4	12
EQ11/12	7	FARB	S	2	10
EQ25	10	FARB	LS	2	12
EQ25	18	FARB	SL	5	0
EQ25	19	FARB	LS	7	6
EQ25	21	FARB	LS	7	4
EQ25	22	FARB	LS	4	16
EQ25	23	FARB	LS	6	12
BLOCK B	24	FARB	SL	3	4
BLOCK B	43	FARB	LFS	3	10
BLOCK B	73	FARB	LS	2	17
BLOCK B	85	FARB	LS	2	10
BLOCK B	90	FARB	LS	3	13
BLOCK B	91	FARB	LS	2	14
BLOCK B	92	FARB	LS	3	12
BLOCK B	93	FARB	LS	5	16
BLOCK B	94	FARB	LS	4	8
BLOCK B	95	FARB	S	5	12
BLOCK B	96	FARB	LS	5	4
BLOCK B	111	FARB	LS	3	10
BLOCK B	125	FARB	LS	3	16
BLOCK B	128	FARB	LS	3	4
BLOCK B	133	FARB	LS	2	18
BLOCK B	137	FARB	LS	3	19
BLOCK B	138	FARB	LS	4	12
BLOCK B	139	FARB	LS	5	16
BLOCK B	140	FARB	LS	3	0
BLOCK B	142	FARB	LS	5	6
BLOCK B	143	FARB	LS	3	14

TABLE 8-C-10. Sample characteristics of the Fruitland soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	311	FRUITLAND	SL	3	12
IV	317	FRUITLAND	SL	4	6
IV	345	FRUITLAND	SL	3	16
EQ15	27	FRUITLAND	GSCL	5	39
BLOCK B	15	FRUITLAND	SCL	5	33
BLOCK B	42	FRUITLAND	LS	3	45
BLOCK B	44	FRUITLAND	SL	5	35
BLOCK B	70	FRUITLAND	LS	2	20

TABLE 8-C-11. Sample characteristics of the Gilco soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	85	GILCO	SL	2	69
I	92	GILCO	SL	1	75
I	93	GILCO	SL	1	79
I	138	GILCO	SL	3	79
I	139	GILCO	LS	1	79
I	141	GILCO	LS	1	79
I	146	GILCO	SCL	1	79
III	2	GILCO	SL	1.5	60
III	75	GILCO	LS	0	60
III	101	GILCO	SL	1	59
III	126	GILCO	LS	2.5	84
III	136	GILCO	LS	1.5	59
III	142	GILCO	LS	2	28
III	210	GILCO	SL	4	79
IV	214	GILCO	LS	3	34
IV	215	GILCO	SL	1.5	84
IV	218	GILCO	SL	0.5	79
IV	232	GILCO	SL	1	84
IV	233	GILCO	LS	1	69
IV	236	GILCO	LS	1.5	67
IV	237	GILCO	LS	0.5	71
IV	239	GILCO	SL	0.5	79
IV	244	GILCO	LS	0.5	79
IV	245	GILCO	SL	0.5	30
IV	702	GILCO	SL	1	35
IV	743	GILCO	SCL	1	0
IV	749	GILCO	SL	1	0
IV	751	GILCO	SL	1	0
IV	754	GILCO	CL	1	0
IV	770	GILCO	SL	1	0
EQ9	28	GILCO	S	1	84
EQ9	30	GILCO	S	1	47
EQ9	31	GILCO	S	3	47
EQ9	32	GILCO	S	3	51
EQ9	37	GILCO	LS	0	39
EQ9	38	GILCO	S	2	84
EQ9	43	GILCO	CL	1	53
EQ9	44	GILCO	CL	1	49

TABLE 8-C-11 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
EQ9	46	GILCO	CL	1	67
EQ9	48	GILCO	LS	1	79
EQ9	82	GILCO	SCL	1	0
EQ11/12	1	GILCO	SL	1	84
EQ11/12	10	GILCO	SL	1	8
EQ11/12	12	GILCO	SCL	4	24
EQ15	30	GILCO	SL	3	14
EQ15	31	GILCO	LS	4	6
BLOCK B	34	GILCO	CL	1	0
BLOCK B	37	GILCO	CL	1	0
BLOCK B	38	GILCO	CL	0	0
BLOCK B	39	GILCO	CL	0	0
BLOCK B	144	GILCO	SCL	0	0
BLOCK B	145	GILCO	SCL	0	0
BLOCK B	146	GILCO	SCL	1	0
BLOCK B	147	GILCO	SCL	1	0
BLOCK B	148	GILCO	SCL	1	0

TABLE 8-C-12. Sample characteristics of the Grieta soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	265	GRIETA	SL	2	16
IV	272	GRIETA	SL	3	17
IV	287	GRIETA	SL	3	22
IV	320	GRIETA	SL	4	22
IV	334	GRIETA	SL	3	10
IV	335	GRIETA	SL	3	14
IV	336	GRIETA	SL	4	12
IV	353	GRIETA	LS	3	12
IV	356	GRIETA	SL	2	20
IV	365	GRIETA	SL	3	20
IV	375	GRIETA	SL	1	8
IV	382	GRIETA	SL	5	22
IV	384	GRIETA	SL	2	14
IV	387	GRIETA	SL	3	14
IV	416	GRIETA	SL	4	6
IV	607	GRIETA	LS	2	18
EQ5/6	9	GRIETA	LS	5	33
EQ9	6	GRIETA	LS	5	26

TABLE 8-C-13. Sample characteristics of the Hoskey soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	323	HOSKEY	C	1	0
IV	327	HOSKEY	C	0	0
IV	328	HOSKEY	C	0	0
IV	329	HOSKEY	CL	1	0
IV	332	HOSKEY	CL	1	0
IV	333	HOSKEY	CL	1	0
IV	359	HOSKEY	CL	1	0
IV	362	HOSKEY	C	1	0
IV	363	HOSKEY	CL	1	0
IV	379	HOSKEY	CL	1	0
IV	407	HOSKEY	CL	0	0
IV	412	HOSKEY	CL	0	0
IV	511	HOSKEY	CL	3	0
IV	512	HOSKEY	CL	1	0
IV	513	HOSKEY	CL	1	0
IV	729	HOSKEY	CL	1	0
EQ11/12	19	HOSKEY	C	1	0

TABLE 8-C-14. Sample characteristics of the Huerfano soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	2	HUERFANO	CL	1.5	0
I	15	HUERFANO	CL	4	0
I	18	HUERFANO	SL	1	0
I	31	HUERFANO	LS	1	4
I	42	HUERFANO	CL	10	0
I	64	HUERFANO	SCL	2	0
I	69	HUERFANO	CL	2	0
I	80	HUERFANO	CL	3	0
I	91	HUERFANO	SL	5	0
I	109	HUERFANO	SL	1.5	0
I	115	HUERFANO	CL	1	0
I	117	HUERFANO	SCL	5	0
I	118	HUERFANO	CL	5	0
I	120	HUERFANO	SCL	1.5	6
I	130	HUERFANO	CL	5	0
II	6	HUERFANO	CL	2	0
II	8	HUERFANO	CL	4	0
II	30	HUERFANO	CL	1	0
II	32	HUERFANO	CL	1.5	0
II	33	HUERFANO	CL	1.5	0
II	37	HUERFANO	SCL	1	0
II	44	HUERFANO	CL	1.5	0
II	45	HUERFANO	CL	1.5	0
II	46	HUERFANO	SCL	1.5	0
II	50	HUERFANO	SCL	3	0
II	51	HUERFANO	CL	7	0
III	41	HUERFANO	C	0.5	0
III	50	HUERFANO	SCL	1	0
III	62	HUERFANO	SCL	4	0
III	92	HUERFANO	SCL	9	0
III	93	HUERFANO	SL	4.5	0
III	94	HUERFANO	C	3	0
III	96	HUERFANO	CL	3	0
III	121	HUERFANO	CL	3	0
III	122	HUERFANO	CL	3	0
III	124	HUERFANO	SCL	1.5	0
III	129	HUERFANO	CL	3.5	0
III	165	HUERFANO	CL	6.5	0

TABLE 8-C-14 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	166	HUERFANO	CL	6	0
III	183	HUERFANO	SCL	3	0
III	184	HUERFANO	CL	4	0
III	185	HUERFANO	CL	6	0
III	186	HUERFANO	CL	6	0
III	188	HUERFANO	SCL	0	0
III	192	HUERFANO	CL	1	0
III	208	HUERFANO	CL	3	0
III	209	HUERFANO	CL	3	0
III	211	HUERFANO	SCL	1	0
III	214	HUERFANO	SCL	1	0
III	216	HUERFANO	SCL	1	0
III	217	HUERFANO	CL	0	0
III	218	HUERFANO	CL	0	0
III	220	HUERFANO	CL	0	0
III	225	HUERFANO	CL	1	0
III	226	HUERFANO	SCL	1	0
III	242	HUERFANO	CL	0.5	0
III	243	HUERFANO	CL	0.5	0
III	244	HUERFANO	CL	0.5	0
III	252	HUERFANO	SL	1.5	4
III	270	HUERFANO	SCL	0	0
III	278	HUERFANO	CL	0	0
III	279	HUERFANO	CL	1	0
III	280	HUERFANO	CL	0	0
III	308	HUERFANO	CL	0.5	0
III	309	HUERFANO	CL	1	0
III	310	HUERFANO	CL	1	0
III	315	HUERFANO	CL	1	0
III	316	HUERFANO	CL	1	0
III	317	HUERFANO	CL	1.5	0
III	318	HUERFANO	CL	1.5	0
III	319	HUERFANO	SCL	1	0
III	356	HUERFANO	C	1	0
III	357	HUERFANO	CL	0.5	0
III	358	HUERFANO	CL	0.5	0
III	359	HUERFANO	SCL	1	0
III	382	HUERFANO	CL	0	0

TABLE 8-C-14 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	434	HUERFANO	SL	1	5
III	462	HUERFANO	SL	1	0
III	469	HUERFANO	CL	1	0
III	480	HUERFANO	SCL	2.5	0
III	481	HUERFANO	SCL	1	0
III	482	HUERFANO	SCL	0.5	0
III	483	HUERFANO	SCL	0.5	0
III	484	HUERFANO	SCL	3	0
III	485	HUERFANO	SCL	3.5	0
III	487	HUERFANO	CL	2	0
III	488	HUERFANO	CL	7	0
III	489	HUERFANO	CL	2.5	0
III	490	HUERFANO	CL	7.5	0
III	491	HUERFANO	CL	0.5	0
III	493	HUERFANO	SCL	2.5	0
III	494	HUERFANO	SCL	1	0
III	495	HUERFANO	SCL	0.5	0
III	496	HUERFANO	SCL	0.5	0
III	497	HUERFANO	SCL	3	0
III	498	HUERFANO	SCL	3.5	0
III	500	HUERFANO	CL	2	0
III	501	HUERFANO	CL	7	0
III	502	HUERFANO	CL	2.5	0
III	503	HUERFANO	CL	7.5	0
III	504	HUERFANO	CL	0.5	0
IV	8	HUERFANO	SCL	1	0
IV	85	HUERFANO	CL	1	0
IV	89	HUERFANO	CL	0.5	0
IV	152	HUERFANO	SL	1	0
IV	154	HUERFANO	SCL	0.5	0
IV	164	HUERFANO	SCL	0.5	0
IV	175	HUERFANO	CL	3	0
IV	222	HUERFANO	CL	2	0
IV	225	HUERFANO	SL	0.5	0
IV	227	HUERFANO	SCL	2	0
IV	228	HUERFANO	LS	1.5	10
IV	229	HUERFANO	LS	1	7
IV	230	HUERFANO	SCL	1	0

TABLE 8-C-14 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	231	HUERFANO	SCL	1	0
IV	243	HUERFANO	SCL	1	0
IV	247	HUERFANO	CL	8	0
IV	248	HUERFANO	CL	6	0
IV	249	HUERFANO	CL	3	0
IV	266	HUERFANO	CL	1	0
IV	277	HUERFANO	CL	2	0
IV	295	HUERFANO	SCL	4	0
IV	298	HUERFANO	SL	3	4
IV	315	HUERFANO	CL	1	0
IV	316	HUERFANO	SCL	1	0
IV	340	HUERFANO	SCL	1	0
IV	350	HUERFANO	LS	5	4
IV	361	HUERFANO	SL	3	4
IV	408	HUERFANO	CL	0	0
IV	409	HUERFANO	CL	0	0
IV	410	HUERFANO	CL	0	0
IV	411	HUERFANO	CL	0	0
IV	426	HUERFANO	SL	3	4
IV	429	HUERFANO	C	1	0
IV	430	HUERFANO	CL	3	0
IV	463	HUERFANO	LS	5	4
IV	474	HUERFANO	LS	10	4
IV	475	HUERFANO	C	10	0
IV	490	HUERFANO	SCL	0	0
IV	492	HUERFANO	CL	1	0
IV	510	HUERFANO	SL	2	5
IV	515	HUERFANO	CL	1	0
IV	516	HUERFANO	CL	1	0
IV	517	HUERFANO	SCL	1	0
IV	519	HUERFANO	SL	2	0
IV	520	HUERFANO	CL	1	0
IV	521	HUERFANO	SCL	2	0
IV	522	HUERFANO	CL	15	0
IV	527	HUERFANO	C	4	0
IV	529	HUERFANO	CL	1	0
IV	530	HUERFANO	C	2	0
IV	531	HUERFANO	CL	7	0

TABLE 8-C-14 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	532	HUERFANO	SCL	5	0
IV	536	HUERFANO	SL	3	0
IV	537	HUERFANO	C	1	0
IV	539	HUERFANO	SCL	3	0
IV	554	HUERFANO	SL	5	0
IV	555	HUERFANO	C	0	0
IV	556	HUERFANO	C	1	0
IV	571	HUERFANO	CL	3	0
IV	572	HUERFANO	C	0	0
IV	573	HUERFANO	C	1	0
IV	574	HUERFANO	C	3	0
IV	575	HUERFANO	C	3	0
IV	576	HUERFANO	C	3	0
IV	577	HUERFANO	C	1	0
IV	578	HUERFANO	C	1	0
IV	581	HUERFANO	C	1	0
IV	589	HUERFANO	SCL	3	0
IV	600	HUERFANO	LS	1	7
IV	614	HUERFANO	SCL	2	0
IV	621	HUERFANO	C	10	0
IV	622	HUERFANO	C	9	0
IV	623	HUERFANO	C	3	0
IV	624	HUERFANO	SCL	1	0
IV	627	HUERFANO	C	1	0
IV	630	HUERFANO	C	1	0
IV	631	HUERFANO	SL	1	0
IV	641	HUERFANO	C	0	0
IV	642	HUERFANO	CL	1	0
IV	643	HUERFANO	C	1	0
IV	644	HUERFANO	CL	2	0
IV	645	HUERFANO	CL	3	0
IV	646	HUERFANO	CL	3	0
IV	660	HUERFANO	C	1	0
IV	661	HUERFANO	CL	1	0
IV	663	HUERFANO	CL	0	0
IV	676	HUERFANO	SL	3	0
IV	677	HUERFANO	C	2	0
IV	678	HUERFANO	C	3	0

TABLE 8-C-14 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	679	HUERFANO	C	5	0
IV	680	HUERFANO	C	3	0
IV	681	HUERFANO	C	3	0
IV	682	HUERFANO	C	5	0
IV	692	HUERFANO	SCL	2	0
IV	693	HUERFANO	SCL	2	0
IV	694	HUERFANO	CL	2	0
IV	695	HUERFANO	SCL	3	0
IV	696	HUERFANO	CL	2	0
IV	697	HUERFANO	C	2	0
IV	708	HUERFANO	C	2	0
IV	718	HUERFANO	C	1	0
IV	722	HUERFANO	SCL	3	0
IV	723	HUERFANO	SL	3	4
IV	733	HUERFANO	CL	1	0
IV	735	HUERFANO	SCL	3	0
IV	736	HUERFANO	CL	1	0
IV	739	HUERFANO	C	2	0
IV	740	HUERFANO	C	2	0
IV	741	HUERFANO	C	2	0
IV	745	HUERFANO	CL	1	0
IV	746	HUERFANO	C	1	0
IV	747	HUERFANO	CL	1	0
IV	758	HUERFANO	CL	2	0
IV	759	HUERFANO	CL	1	0
IV	760	HUERFANO	C	3	0
IV	766	HUERFANO	C	2	0
IV	767	HUERFANO	SCL	2	0
EQ5/6	2	HUERFANO	SCL	4	0
EQ5/6	4	HUERFANO	SCL	2	0
EQ9	49	HUERFANO	CL	3	0
EQ10	5	HUERFANO	LS	3	8
EQ13	1	HUERFANO	C	2	0
EQ13	2	HUERFANO	CL	1	0
EQ13	4	HUERFANO	CL	2	0
EQ13	6	HUERFANO	CL	3	0
EQ13	7	HUERFANO	CL	5	0
EQ13	8	HUERFANO	CL	4	0

TABLE 8-C-14 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
	EQ13	9 HUERFANO	VGSL	2	0
	EQ13	10 HUERFANO	GSCL	2	0
	EQ13	11 HUERFANO	CL	4	0
	EQ13	12 HUERFANO	CL	3	0
	EQ13	16 HUERFANO	SCL	5	0
	EQ13	18 HUERFANO	CL	2	0
	EQ15	24 HUERFANO	CL	5	0
	EQ15	42 HUERFANO	CL	5	0
	EQ15	59 HUERFANO	LS	1	5
	EQ25	2 HUERFANO	CL	2	0
	EQ25	16 HUERFANO	SCL	6	0
	EQ25	17 HUERFANO	CL	6	0
	EQ25	20 HUERFANO	SCL	4	0
BLOCK B	1	HUERFANO	CL	3	0
BLOCK B	9	HUERFANO	CL	1	0
BLOCK B	12	HUERFANO	CL	1	6
BLOCK B	13	HUERFANO	CL	1	0
BLOCK B	18	HUERFANO	CL	7	0
BLOCK B	21	HUERFANO	CL	1	0
BLOCK B	26	HUERFANO	CL	5	5
BLOCK B	103	HUERFANO	CL	2	0
BLOCK B	129	HUERFANO	SL	6	0

TABLE 8-C-15. Sample characteristics of the Jocity soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	94	JOCITY	SL	1	79
I	105	JOCITY	SL	1	39
I	111	JOCITY	CL	1	81
I	121	JOCITY	CL	1.5	25
I	122	JOCITY	CL	1	30
I	123	JOCITY	SCL	1.5	43
I	127	JOCITY	CL	1	34
I	140	JOCITY	LS	1.5	24
I	148	JOCITY	CL	1	4
II	25	JOCITY	SCL	1	79
II	26	JOCITY	CL	1.5	79
II	27	JOCITY	CL	1	79
II	28	JOCITY	CL	1	79
II	29	JOCITY	CL	1	71
III	4	JOCITY	SCL	1	28
III	169	JOCITY	SL	1	63
III	181	JOCITY	SL	2	35
III	182	JOCITY	SL	8.5	59
III	229	JOCITY	SL	1	0
III	230	JOCITY	SCL	1	27
III	231	JOCITY	SCL	1	4
III	233	JOCITY	SCL	1	22
III	234	JOCITY	S	1	83
III	236	JOCITY	SL	1	5
III	237	JOCITY	SL	1	6
IV	212	JOCITY	SL	1	32
IV	216	JOCITY	SL	1	91
IV	220	JOCITY	SL	1	49
IV	223	JOCITY	CL	1	22
IV	234	JOCITY	SL	0.5	71
IV	488	JOCITY	CL	0	0
IV	711	JOCITY	SL	2	12
IV	712	JOCITY	SL	4	14
IV	713	JOCITY	SL	2	8
IV	719	JOCITY	SL	1	0
IV	720	JOCITY	CL	1	0
IV	725	JOCITY	SL	1	4
IV	726	JOCITY	SCL	1	0

TABLE 8-C-15 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	727	JOCITY	LS	1	0
IV	728	JOCITY	SCL	1	0
IV	769	JOCITY	SCL	1	0
EQ9	22	JOCITY	CL	5	0
EQ9	24	JOCITY	GSL	1	0
EQ9	39	JOCITY	SL	2	43
EQ9	42	JOCITY	LS	1	22
EQ9	47	JOCITY	LS	3	79
EQ9	54	JOCITY	LS	2	90
EQ9	55	JOCITY	SL	1	90
EQ9	56	JOCITY	CL	2	89
EQ9	57	JOCITY	CL	2	79
EQ9	58	JOCITY	CL	2	79
EQ9	59	JOCITY	CL	1	79
EQ9	62	JOCITY	SCL	1	79
EQ9	63	JOCITY	CL	1	0
EQ9	65	JOCITY	CL	1	0
EQ9	67	JOCITY	SCL	1	79
EQ9	68	JOCITY	L	4	75
EQ9	69	JOCITY	L	3	79
EQ9	70	JOCITY	CL	1	0
EQ9	73	JOCITY	CL	1	0
EQ9	74	JOCITY	CL	1	0
EQ9	75	JOCITY	CL	0	0
EQ9	76	JOCITY	SCL	1	0
EQ9	77	JOCITY	L	0	0
EQ9	78	JOCITY	CL	1	0
EQ9	79	JOCITY	SL	1	0
EQ9	80	JOCITY	CL	1	0
EQ9	81	JOCITY	CL	1	0
EQ9	83	JOCITY	CL	1	0
EQ9	84	JOCITY	CL	1	0
EQ9	85	JOCITY	SCL	1	0
EQ9	86	JOCITY	SL	1	0
EQ9	87	JOCITY	SL	1	0
EQ9	88	JOCITY	SCL	1	0
EQ9	89	JOCITY	CL	1	0
EQ9	90	JOCITY	CL	1	0

TABLE 8-C-15 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
EQ9	91	JOCITY	SCL	0	0
EQ9	92	JOCITY	CL	0	0
EQ9	93	JOCITY	CL	0	0
EQ9	94	JOCITY	CL	1	0
EQ9	95	JOCITY	CL	1	0
EQ9	96	JOCITY	CL	1	0
EQ9	97	JOCITY	CL	1	0
EQ9	98	JOCITY	CL	1	0
EQ9	99	JOCITY	CL	4	33
EQ9	100	JOCITY	GSL	3	79
EQ9	101	JOCITY	GSL	3	89
EQ11/12	9	JOCITY	CL	1	6
EQ11/12	13	JOCITY	CL	2	31
EQ11/12	14	JOCITY	CL	2	43
EQ11/12	15	JOCITY	CL	0	75
EQ11/12	16	JOCITY	SL	1	59
EQ11/12	17	JOCITY	CL	1	83
EQ11/12	18	JOCITY	CL	1	24
EQ15	28	JOCITY	SL	2	79
EQ15	29	JOCITY	SL	3	4
EQ15	32	JOCITY	SL	3	0
EQ15	64	JOCITY	GSL	2	0
BLOCK B	32	JOCITY	CL	1	0
BLOCK B	33	JOCITY	CL	1	0
BLOCK B	35	JOCITY	C	1	0
BLOCK B	36	JOCITY	CL	1	0

TABLE 8-C-16. Sample characteristics of the Mack soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
II	48	MACK	SL	5	79
III	44	MACK	SL	1	21
III	46	MACK	SL	2	60
III	289	MACK	SCL	2	87
III	290	MACK	SL	3	79
III	291	MACK	SL	3	83
III	293	MACK	SCL	1	89
III	294	MACK	SL	4	79
III	296	MACK	SCL	0.5	37
III	301	MACK	SL	0.5	79
III	302	MACK	SL	4	85
III	303	MACK	SL	1	79
III	326	MACK	SL	0.5	78
III	327	MACK	SL	2	85
III	335	MACK	SL	0	71
III	336	MACK	SL	0	69
III	337	MACK	SL	0	0
III	342	MACK	SL	0.5	69
III	343	MACK	SL	0.5	75
III	344	MACK	SL	0.5	75
III	346	MACK	SL	0.5	79
III	348	MACK	SL	0.5	78
III	349	MACK	SL	2	79
III	350	MACK	SL	2	69
IV	46	MACK	SL	3	29
IV	51	MACK	LS	5	79
IV	54	MACK	SL	7	94
IV	63	MACK	LS	1.5	84
IV	68	MACK	LS	1.5	41
IV	90	MACK	SL	3	63
IV	110	MACK	SCL	6	52
IV	354	MACK	SL	2	14
IV	355	MACK	SL	4	13
IV	366	MACK	SL	3	16
IV	367	MACK	SL	2	20
IV	368	MACK	SL	1	12
IV	383	MACK	SL	3	19
IV	425	MACK	SL	1	5

TABLE 8-C-17. Sample characteristics of the Mayqueen soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	9	MAYQUEEN	LS	0.1	36
I	13	MAYQUEEN	LS	9	37
I	14	MAYQUEEN	LS	1	67
I	24	MAYQUEEN	LS	1	87
I	26	MAYQUEEN	LS	1	56
I	27	MAYQUEEN	LS	1	59
I	28	MAYQUEEN	LS	1	37
I	33	MAYQUEEN	LS	1	46
I	34	MAYQUEEN	LS	1	66
I	35	MAYQUEEN	LS	0.5	48
I	36	MAYQUEEN	LS	1	87
I	39	MAYQUEEN	LS	1	53
I	43	MAYQUEEN	LS	4	79
I	45	MAYQUEEN	LS	1	65
I	46	MAYQUEEN	LS	1	24
I	47	MAYQUEEN	LS	1	56
I	48	MAYQUEEN	LS	1	52
I	54	MAYQUEEN	LS	2	37
I	56	MAYQUEEN	LS	1	39
I	57	MAYQUEEN	LS	1	48
I	59	MAYQUEEN	LS	1	16
I	61	MAYQUEEN	LS	1	31
I	63	MAYQUEEN	LS	1	33
I	66	MAYQUEEN	LS	1	30
I	67	MAYQUEEN	LS	1	43
I	70	MAYQUEEN	LS	3	40
I	72	MAYQUEEN	LS	3	79
I	77	MAYQUEEN	LS	3	79
I	79	MAYQUEEN	LS	2	22
I	87	MAYQUEEN	LS	1	69
I	97	MAYQUEEN	LS	6	59
I	104	MAYQUEEN	LS	1	43
I	128	MAYQUEEN	LS	1	28
I	137	MAYQUEEN	LS	1.5	79
I	142	MAYQUEEN	LS	1	75
I	143	MAYQUEEN	LS	1	79
II	5	MAYQUEEN	S	2	60
II	14	MAYQUEEN	LS	1.5	79

TABLE 8-C-17 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
II	23	MAYQUEEN	LS	1.5	79
II	58	MAYQUEEN	LS	7	83
II	67	MAYQUEEN	LS	1.5	63
III	54	MAYQUEEN	LS	4	40
III	56	MAYQUEEN	LS	4	60
III	58	MAYQUEEN	LS	1.5	18
III	59	MAYQUEEN	LS	0	14
III	60	MAYQUEEN	S	4	30
III	67	MAYQUEEN	LS	2	21
III	69	MAYQUEEN	LS	4	16
III	71	MAYQUEEN	LS	4	60
III	72	MAYQUEEN	LS	3	44
III	77	MAYQUEEN	LS	1	60
III	78	MAYQUEEN	LS	0.5	60
III	79	MAYQUEEN	LS	2	60
III	125	MAYQUEEN	LS	1.5	39
III	130	MAYQUEEN	LS	11	59
III	134	MAYQUEEN	LS	1	47
III	138	MAYQUEEN	LS	1	71
III	162	MAYQUEEN	LS	1	51
III	176	MAYQUEEN	LS	1	75
III	179	MAYQUEEN	LS	7	37
III	187	MAYQUEEN	LS	5	43
III	196	MAYQUEEN	LS	2.5	30
III	228	MAYQUEEN	LS	3.5	54
III	256	MAYQUEEN	LS	5	79
IV	47	MAYQUEEN	LS	2	74
IV	59	MAYQUEEN	LS	5	61
IV	189	MAYQUEEN	LS	4	32
IV	197	MAYQUEEN	LS	1.5	50
IV	199	MAYQUEEN	LS	6.5	47
IV	342	MAYQUEEN	LS	6	37
IV	372	MAYQUEEN	LS	2	33
IV	374	MAYQUEEN	LS	1	22
IV	386	MAYQUEEN	LS	3	22
IV	436	MAYQUEEN	LS	3	31
IV	450	MAYQUEEN	LS	2	49
IV	451	MAYQUEEN	LS	1	47

TABLE 8-C-17 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	457	MAYQUEEN	S	3	20
IV	467	MAYQUEEN	LS	2	75
IV	493	MAYQUEEN	S	7	79
IV	552	MAYQUEEN	S	3	33
IV	561	MAYQUEEN	LS	3	26
IV	604	MAYQUEEN	S	4	59
EQ9	2	MAYQUEEN	S	5	79
EQ9	7	MAYQUEEN	S	8	83
EQ9	9	MAYQUEEN	S	4	49
EQ9	11	MAYQUEEN	S	1	49
EQ9	25	MAYQUEEN	LS	1	89
EQ10	1	MAYQUEEN	LS	3	41
EQ10	2	MAYQUEEN	S	3	41
EQ10	3	MAYQUEEN	S	4	31
EQ13	13	MAYQUEEN	LS	1	39
EQ15	3	MAYQUEEN	LS	7	41
EQ15	4	MAYQUEEN	LS	4	79
EQ15	5	MAYQUEEN	LS	4	79
EQ15	8	MAYQUEEN	LS	2	79
EQ15	13	MAYQUEEN	LS	1	49
EQ15	14	MAYQUEEN	SL	5	17
EQ15	15	MAYQUEEN	LS	1	45
EQ15	16	MAYQUEEN	LS	1	37
EQ15	25	MAYQUEEN	LS	5	15
EQ15	26	MAYQUEEN	LS	8	18
EQ15	58	MAYQUEEN	LS	1	49
BLOCK B	50	MAYQUEEN	LS	2	98
BLOCK B	52	MAYQUEEN	LS	1	31
BLOCK B	53	MAYQUEEN	LS	1	79
BLOCK B	56	MAYQUEEN	LS	2	98
BLOCK B	57	MAYQUEEN	S	2	98
BLOCK B	61	MAYQUEEN	LS	1	108
BLOCK B	80	MAYQUEEN	S	3	102
BLOCK B	81	MAYQUEEN	LS	2	45
BLOCK B	89	MAYQUEEN	S	2	49
BLOCK B	97	MAYQUEEN	LFS	3	98
BLOCK B	98	MAYQUEEN	LS	1	142
BLOCK B	120	MAYQUEEN	LS	1	57

TABLE 8-C-18. Sample characteristics of the Monierco soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	153	MONIERCO	SL	2	10
I	161	MONIERCO	SL	5	11
I	165	MONIERCO	SL	5	11
I	166	MONIERCO	SL	5	12
I	167	MONIERCO	SL	3	6
I	168	MONIERCO	SL	2	9
I	171	MONIERCO	SL	4	7
III	25	MONIERCO	SL	2	9
III	26	MONIERCO	SL	2	10
III	27	MONIERCO	SL	2	16
III	30	MONIERCO	SL	3	16
III	383	MONIERCO	SCL	1.5	11
III	384	MONIERCO	SL	0.5	15
III	385	MONIERCO	SL	1	12
III	386	MONIERCO	SL	0.5	12
III	387	MONIERCO	SL	1.5	11
III	394	MONIERCO	SL	1.5	12
III	396	MONIERCO	SCL	0.5	0
III	397	MONIERCO	CL	0.5	0
III	398	MONIERCO	SCL	0.5	7
III	401	MONIERCO	SL	1	16
III	413	MONIERCO	SL	1	10
III	414	MONIERCO	SL	3	10
III	415	MONIERCO	SL	2	10
III	418	MONIERCO	SL	1	6
III	419	MONIERCO	SL	0	15
III	420	MONIERCO	SL	1	11
III	422	MONIERCO	SL	1.5	17
III	423	MONIERCO	SL	1	7
III	424	MONIERCO	SL	1	15
III	425	MONIERCO	SL	1	12
III	426	MONIERCO	SL	1.5	17
III	428	MONIERCO	SCL	2.5	2
III	440	MONIERCO	SL	2	4
III	441	MONIERCO	SL	2	17
III	450	MONIERCO	SL	0.5	14
III	454	MONIERCO	SL	1	10
III	457	MONIERCO	SL	1.5	10

TABLE 8-C-18 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	7	MONIERCO	SL	1	15
IV	9	MONIERCO	SL	0.5	14
IV	10	MONIERCO	SL	0.5	18
IV	14	MONIERCO	SCL	0	11
IV	23	MONIERCO	SCL	0.5	8
IV	26	MONIERCO	SCL	2	4
IV	28	MONIERCO	SL	0.5	18
IV	33	MONIERCO	SL	6.5	17
IV	39	MONIERCO	SL	2	15
IV	42	MONIERCO	SL	3	8
IV	45	MONIERCO	SL	2.5	14
IV	50	MONIERCO	SL	6	14
IV	52	MONIERCO	SL	1.5	19
IV	53	MONIERCO	SL	3	15
IV	57	MONIERCO	SL	6	17
IV	58	MONIERCO	SL	3.5	14
IV	62	MONIERCO	SL	2	18
IV	70	MONIERCO	SL	1.5	13
IV	78	MONIERCO	LS	2	16
IV	84	MONIERCO	SCL	4.5	10
IV	91	MONIERCO	SL	3.5	11
IV	93	MONIERCO	SL	1	9
IV	94	MONIERCO	SL	1	11
IV	95	MONIERCO	SL	1	13
IV	98	MONIERCO	SL	0.5	15
IV	99	MONIERCO	SL	2.5	10
IV	105	MONIERCO	SL	2.5	12
IV	108	MONIERCO	SCL	8	17
IV	111	MONIERCO	SL	4	14
IV	113	MONIERCO	SL	5	11
IV	115	MONIERCO	SL	3	13
IV	116	MONIERCO	SL	2	13
IV	130	MONIERCO	SL	2	11
IV	131	MONIERCO	SL	2	12
IV	133	MONIERCO	SL	0.5	9
IV	134	MONIERCO	SCL	0.5	17
IV	135	MONIERCO	SCL	4.5	17
IV	139	MONIERCO	SCL	0.5	5

TABLE 8-C-18 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	140	MONIERCO	SL	1	10
IV	165	MONIERCO	SL	1.5	14
IV	166	MONIERCO	SL	2	17
IV	167	MONIERCO	SL	4	15
IV	168	MONIERCO	SL	0.5	12
IV	172	MONIERCO	SL	1	10
IV	173	MONIERCO	SL	3	7
IV	176	MONIERCO	SL	4	19
IV	179	MONIERCO	SL	4	14
IV	186	MONIERCO	SL	1.5	7
IV	187	MONIERCO	SL	2	16
IV	188	MONIERCO	SL	0.5	7
IV	201	MONIERCO	SL	1.5	14
IV	202	MONIERCO	SL	1.5	10
IV	208	MONIERCO	SL	2	15
IV	246	MONIERCO	LS	3	10
IV	299	MONIERCO	SL	2	9
IV	308	MONIERCO	SL	2	6
IV	319	MONIERCO	SL	4	8
IV	330	MONERICO	SCL	1	4
IV	346	MONIERCO	SL	2	9
IV	376	MONIERCO	SCL	2	5
IV	393	MONIERCO	SL	3	11
IV	400	MONIERCO	SL	3	10
IV	403	MONIERCO	SL	1	12
IV	442	MONIERCO	SL	3	8
IV	455	MONIERCO	SL	1	6
IV	459	MONIERCO	LS	4	15
IV	500	MONIERCO	SL	2	8
IV	501	MONIERCO	SL	2	8
IV	544	MONERICO	SL	3	8
IV	546	MONIERCO	SL	2	5
IV	559	MONIERCO	SL	5	5
IV	567	MONIERCO	SL	1	6
IV	617	MONIERCO	LS	3	20
EQ5/6	5	MONIERCO	SL	2	6
EQ5/6	6	MONIERCO	SL	7	6
EQ5/6	7	MONIERCO	SL	5	10

TABLE 8-C-18 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
EQ5/6	12	MONIERCO	SL	6	10
EQ5/6	13	MONIERCO	SL	4	0
EQ5/6	14	MONIERCO	SL	8	4
EQ9	10	MONIERCO	SL	2	13
EQ9	13	MONIERCO	SL	3	12
EQ10	6	MONIERCO	LS	2	12
EQ25	5	MONIERCO	LS	4	14
EQ25	6	MONIERCO	SL	4	10
EQ25	9	MONIERCO	SL	3	8
EQ25	14	MONIERCO	LS	7	18
BLOCK B	135	MONIERCO	LS	2	19

TABLE 8-C-19. Sample characteristics of the Nakai soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	152	NAKAI	SL	5	4
I	163	NAKAI	SL	4	6
IV	262	NAKAI	SL	6	16
IV	273	NAKAI	SL	4	8
IV	274	NAKAI	SL	10	14
IV	279	NAKAI	SL	3	22
IV	284	NAKAI	SL	3	12
IV	286	NAKAI	SL	5	6
IV	290	NAKAI	SL	4	22
IV	471	NAKAI	SL	3	18

New Addition:
IV 49 Nakai

TABLE 8-C-20. Sample characteristics of the Patel soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	380	PATEL	CL	1	0
IV	415	PATEL	SL	4	8
IV	428	PATEL	C	2	0
IV	477	PATEL	LS	5	13
IV	491	PATEL	C	1	0
IV	528	PATEL	VGSL	2	0
IV	541	PATEL	SL	3	20
IV	542	PATEL	SL	2	4
IV	553	PATEL	CL	0	0
IV	568	PATEL	C	5	0
IV	580	PATEL	SL	1	4
IV	582	PATEL	C	1	0
IV	601	PATEL	SCL	0	0
IV	602	PATEL	S	1	0
IV	608	PATEL	S	4	8
IV	613	PATEL	S	3	12
IV	626	PATEL	S	1	0
IV	639	PATEL	S	3	8
IV	647	PATEL	LS	3	8
IV	717	PATEL	GSL	1	0
IV	731	PATEL	C	1	0
IV	737	PATEL	CL	2	0
IV	742	PATEL	LS	3	7
IV	744	PATEL	S	1	9
IV	761	PATEL	SL	3	8
IV	765	PATEL	LS	3	6
EQ9	29	PATEL	C	4	0
EQ13	3	PATEL	C	5	0
EQ15	70	PATEL	S	2	0
EQ15	72	PATEL	C	1	0

TABLE 8-C-21. Sample characteristics of the Persayo soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	150	PERSAYO	SCL	2	10
I	151	PERSAYO	SCL	3	8
III	476	PERSAYO	CL	4	4
IV	15	PERSAYO	SL	7.5	11
IV	92	PERSAYO	SCL	4	4
IV	119	PERSAYO	SCL	5	3
IV	120	PERSAYO	SCL	9	5
IV	132	PERSAYO	SCL	2	4
IV	136	PERSAYO	CL	7	6
IV	137	PERSAYO	SCL	7.5	6
IV	138	PERSAYO	SCL	2	3
IV	174	PERSAYO	SCL	3	3
IV	185	PERSAYO	SCL	5	3
IV	194	PERSAYO	SCL	5	8
IV	207	PERSAYO	SCL	1	4
IV	394	PERSAYO	SCL	8	4
IV	470	PERSAYO	CL	3	0
IV	524	PERSAYO	SCL	3	0
IV	540	PERSAYO	CL	3	4
IV	558	PERSAYO	CL	5	0
EQ5/6	1	PERSAYO	CL	2	0

TABLE 8-C-22. Sample characteristics of the Razito soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	1	RAZITO	LS	19	59
I	4	RAZITO	S	2	60
I	7	RAZITO	LS	2.5	60
I	11	RAZITO	LS	2.5	33
I	12	RAZITO	LS	1.5	28
I	19	RAZITO	LS	1	59
I	21	RAZITO	LS	1	12
I	22	RAZITO	LS	1	12
I	32	RAZITO	LS	3	25
I	49	RAZITO	S	4	73
I	51	RAZITO	LS	1	70
I	52	RAZITO	LS	0.5	18
I	53	RAZITO	LS	1	60
I	55	RAZITO	LS	1	8
I	60	RAZITO	S	1	79
I	68	RAZITO	LS	1	39
I	75	RAZITO	LS	3	87
I	82	RAZITO	LS	4	91
I	86	RAZITO	LS	1	79
I	88	RAZITO	S	1.5	79
I	90	RAZITO	S	3	79
I	101	RAZITO	LS	4	48
I	102	RAZITO	LS	1	66
I	103	RAZITO	LS	1	14
I	106	RAZITO	SL	2	15
I	107	RAZITO	S	3	52
I	108	RAZITO	LS	4	75
I	129	RAZITO	LS	1.5	71
I	134	RAZITO	LS	1	59
II	10	RAZITO	LS	1.5	79
II	38	RAZITO	LS	1.5	79
II	59	RAZITO	LS	5	79
II	60	RAZITO	LS	4	83
II	61	RAZITO	LS	2	79
II	63	RAZITO	LS	4	75
II	64	RAZITO	LS	1	83
II	66	RAZITO	LS	1	50
II	68	RAZITO	LS	1	83

TABLE 8-C-22 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
II	69	RAZITO	LS	4	98
III	68	RAZITO	LS	3	22
III	70	RAZITO	S	4	25
III	74	RAZITO	S	3	33
III	76	RAZITO	S	2	60
III	115	RAZITO	LS	1	79
III	135	RAZITO	LS	5	59
III	137	RAZITO	LS	4.5	59
III	140	RAZITO	LS	1	59
III	161	RAZITO	LS	1	27
III	173	RAZITO	LS	1	79
III	174	RAZITO	LS	1	75
III	177	RAZITO	LS	1	69
III	207	RAZITO	LS	9	23
III	222	RAZITO	LS	2	91
III	227	RAZITO	LS	6	43
III	240	RAZITO	LS	5	57
III	402	RAZITO	LS	0.5	20
III	463	RAZITO	LS	2	72
IV	141	RAZITO	LS	1	36
IV	145	RAZITO	LS	2	18
IV	148	RAZITO	LS	1	11
IV	156	RAZITO	LS	2	31
IV	157	RAZITO	LS	5	23
IV	160	RAZITO	LS	1	18
IV	181	RAZITO	LS	15	12
IV	210	RAZITO	LS	6	41
IV	211	RAZITO	LS	4	20
IV	313	RAZITO	LS	2	24
IV	314	RAZITO	S	4	26
IV	347	RAZITO	LS	2	8
IV	401	RAZITO	S	3	49
IV	485	RAZITO	S	2	10
IV	486	RAZITO	SL	1	4
IV	494	RAZITO	LS	7	49
IV	495	RAZITO	S	9	83
IV	502	RAZITO	S	7	79
IV	503	RAZITO	S	9	35

TABLE 8-C-22 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	550	RAZITO	S	2	30
IV	551	RAZITO	S	5	20
IV	566	RAZITO	S	10	28
IV	583	RAZITO	S	3	79
IV	584	RAZITO	LS	7	69
IV	585	RAZITO	LS	5	20
IV	586	RAZITO	S	4	41
IV	591	RAZITO	S	3	22
IV	592	RAZITO	S	5	24
IV	593	RAZITO	S	3	39
IV	594	RAZITO	S	5	43
IV	595	RAZITO	S	5	26
IV	596	RAZITO	S	5	51
IV	597	RAZITO	S	3	14
IV	598	RAZITO	S	5	55
IV	599	RAZITO	S	8	45
IV	603	RAZITO	S	3	20
IV	606	RAZITO	S	3	35
IV	610	RAZITO	S	5	79
IV	611	RAZITO	S	8	31
IV	612	RAZITO	S	5	28
IV	615	RAZITO	S	3	35
IV	625	RAZITO	S	3	18
IV	629	RAZITO	S	4	30
IV	632	RAZITO	S	3	24
IV	633	RAZITO	S	12	10
IV	634	RAZITO	S	12	24
IV	648	RAZITO	S	3	12
IV	659	RAZITO	S	1	24
IV	665	RAZITO	S	1	0
IV	666	RAZITO	S	2	16
IV	668	RAZITO	S	2	8
IV	669	RAZITO	S	1	0
IV	671	RAZITO	S	1	8
IV	674	RAZITO	S	3	10
IV	701	RAZITO	SL	1	0
IV	703	RAZITO	S	8	45
IV	704	RAZITO	S	8	59

TABLE 8-C-22 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	714	RAZITO	LS	3	8
IV	715	RAZITO	S	3	17
IV	716	RAZITO	S	3	20
IV	752	RAZITO	S	3	6
IV	757	RAZITO	SL	5	0
EQ5/6	3	RAZITO	LS	9	79
EQ7/8	1	RAZITO	SL	18	79
EQ7/8	2	RAZITO	SL	16	69
EQ7/8	15	RAZITO	LS	2	83
EQ7/8	16	RAZITO	LS	2	79
EQ7/8	24	RAZITO	S	5	61
EQ9	19	RAZITO	S	7	98
EQ9	20	RAZITO	S	11	98
EQ9	21	RAZITO	S	7	98
EQ9	52	RAZITO	S	8	94
EQ9	53	RAZITO	S	7	79
EQ9	106	RAZITO	LS	5	24
EQ9	107	RAZITO	SL	1	16
EQ9	108	RAZITO	LS	15	13
EQ9	109	RAZITO	SL	10	12
EQ10	7	RAZITO	S	2	20
EQ11/12	3	RAZITO	S	7	24
EQ11/12	6	RAZITO	S	5	59
EQ11/12	8	RAZITO	SL	4	55
EQ11/12	11	RAZITO	SL	13	59
EQ15	33	RAZITO	S	5	51
EQ15	34	RAZITO	S	9	47
EQ15	35	RAZITO	S	15	79
BLOCK B	16	RAZITO	SCL	5	98
BLOCK B	45	RAZITO	LS	2	98
BLOCK B	51	RAZITO	LS	2	83
BLOCK B	87	RAZITO	LS	1	51
BLOCK B	88	RAZITO	LS	3	35
BLOCK B	105	RAZITO	LS	1	138
BLOCK B	114	RAZITO	LS	1	128
BLOCK B	117	RAZITO	LS	2	83

TABLE 8-C-23. Sample characteristics of the Redlands Variant soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	44	REDLANDS VARIANT	SL	4	79
II	56	REDLANDS VARIANT	SL	1.5	79
III	5	REDLANDS VARIANT	SL	2	60
III	6	REDLANDS VARIANT	SL	0.5	60
III	7	REDLANDS VARIANT	SL	1	60
III	35	REDLANDS VARIANT	SCL	1.5	43
III	36	REDLANDS VARIANT	SCL	2	36
III	45	REDLANDS VARIANT	SL	1	60
III	81	REDLANDS VARIANT	SL	3.5	33
III	82	REDLANDS VARIANT	SL	2	14
III	83	REDLANDS VARIANT	SL	2.5	79
III	246	REDLANDS VARIANT	LS	3.5	39
III	292	REDLANDS VARIANT	SL	0.5	85
III	295	REDLANDS VARIANT	SCL	1	79
III	297	REDLANDS VARIANT	SL	0.5	85
III	298	REDLANDS VARIANT	SL	0.5	79
III	299	REDLANDS VARIANT	SL	0.5	87
III	300	REDLANDS VARIANT	SL	0.5	76
III	325	REDLANDS VARIANT	SL	0.5	79
III	328	REDLANDS VARIANT	SL	0.5	81
III	329	REDLANDS VARIANT	SL	0	79
III	330	REDLANDS VARIANT	SL	0.5	74
III	331	REDLANDS VARIANT	SCL	0.5	71
III	332	REDLANDS VARIANT	SCL	0	78
III	333	REDLANDS VARIANT	SL	0	69
III	334	REDLANDS VARIANT	SL	0.5	75
III	339	REDLANDS VARIANT	SCL	2	71
III	340	REDLANDS VARIANT	SL	1	71
III	341	REDLANDS VARIANT	SL	0.5	67
III	345	REDLANDS VARIANT	SL	0.5	75
III	347	REDLANDS VARIANT	SL	0.5	67
III	407	REDLANDS VARIANT	SL	0.5	37
III	408	REDLANDS VARIANT	SL	0.5	14
III	460	REDLANDS VARIANT	SL	1	39
III	479	REDLANDS VARIANT	SL	1	63
IV	66	REDLANDS VARIANT	SL	1.5	42
IV	67	REDLANDS VARIANT	SL	1	87

TABLE 8-C-23 (cont)

Area	Site #	Series	Name	Surface Texture	Slope %	Topdressing Thickness
IV	74	REDLANDS	VARIANT	LS	0.5	52
IV	75	REDLANDS	VARIANT	SL	1.5	35
IV	81	REDLANDS	VARIANT	SL	1	51
IV	82	REDLANDS	VARIANT	SL	3	39
IV	87	REDLANDS	VARIANT	LS	1	39
IV	88	REDLANDS	VARIANT	SL	0.5	42
IV	101	REDLANDS	VARIANT	SL	1	43
IV	102	REDLANDS	VARIANT	SL	2	54
IV	103	REDLANDS	VARIANT	SL	2.5	29
IV	155	REDLANDS	VARIANT	LS	0.5	22
IV	158	REDLANDS	VARIANT	LS	1	30
IV	195	REDLANDS	VARIANT	LS	3	55
IV	252	REDLANDS	VARIANT	SL	3	31
IV	275	REDLANDS	VARIANT	SL	4	51
IV	300	REDLANDS	VARIANT	SL	2	22
IV	324	REDLANDS	VARIANT	SL	2	5
IV	325	REDLANDS	VARIANT	SL	2	20
IV	326	REDLANDS	VARIANT	SL	1	5
IV	348	REDLANDS	VARIANT	SL	2	12
IV	391	REDLANDS	VARIANT	SL	2	15
IV	392	REDLANDS	VARIANT	SL	1	18
IV	398	REDLANDS	VARIANT	SL	2	43
IV	402	REDLANDS	VARIANT	SL	1	8
IV	404	REDLANDS	VARIANT	LS	1	20
IV	437	REDLANDS	VARIANT	SL	1	4
IV	458	REDLANDS	VARIANT	SL	1	6
IV	548	REDLANDS	VARIANT	SL	2	8
IV	549	REDLANDS	VARIANT	LS	2	14
IV	562	REDLANDS	VARIANT	LS	3	8
IV	564	REDLANDS	VARIANT	LS	2	12
IV	579	REDLANDS	VARIANT	LS	3	10
EQ7/8	10	REDLANDS	VARIANT	SL	4	53
EQ7/8	19	REDLANDS	VARIANT	SL	1	30
EQ7/8	26	REDLANDS	VARIANT	LS	1	12
EQ7/8	27	REDLANDS	VARIANT	LS	1	24
EQ13	17	REDLANDS	VARIANT	LS	3	49
EQ25	1	REDLANDS	VARIANT	LS	3	49
EQ25	27	REDLANDS	VARIANT	LS	4	40

TABLE 8-C-23 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
EQ25	28	REDLANDS VARIANT	LS	4	49
EQ25	29	REDLANDS VARIANT	LS	3	39
BLOCK B	5	REDLANDS VARIANT	SCL	1	71
BLOCK B	14	REDLANDS VARIANT	SCL	2	89
BLOCK B	58	REDLANDS VARIANT	S	2	98
BLOCK B	82	REDLANDS VARIANT	LS	2	69
BLOCK B	100	REDLANDS VARIANT	SL	3	104

TABLE 8-C-24. Sample characteristics of the Shiprock soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	6	SHIPROCK	SL	0.5	23
I	23	SHIPROCK	LS	1	49
I	25	SHIPROCK	SL	1	26
I	37	SHIPROCK	SL	1	79
I	38	SHIPROCK	LS	1	59
I	40	SHIPROCK	SL	1	7
I	41	SHIPROCK	SL	1	40
I	50	SHIPROCK	SL	0.5	19
I	62	SHIPROCK	LS	1	41
I	65	SHIPROCK	SL	1	19
I	71	SHIPROCK	SL	3	79
I	73	SHIPROCK	SL	1.5	69
I	74	SHIPROCK	LS	0.5	48
I	76	SHIPROCK	LS	1	59
I	84	SHIPROCK	SL	2	69
I	96	SHIPROCK	SL	6	69
I	99	SHIPROCK	SL	1	74
I	100	SHIPROCK	SL	1	73
I	116	SHIPROCK	SL	5	79
I	133	SHIPROCK	LS	5	22
I	158	SHIPROCK	SL	4	55
I	159	SHIPROCK	SL	5	39
II	7	SHIPROCK	SL	0.5	80
II	11	SHIPROCK	SL	1.5	79
II	12	SHIPROCK	LS	1	70
II	13	SHIPROCK	LS	1.5	79
II	15	SHIPROCK	SL	1	38
II	34	SHIPROCK	SL	5	47
II	35	SHIPROCK	SL	5	26
II	36	SHIPROCK	SL	1.5	20
II	39	SHIPROCK	SL	5	79
II	40	SHIPROCK	SL	5	79
II	41	SHIPROCK	SL	5	44
II	47	SHIPROCK	SL	5	35
II	49	SHIPROCK	SL	5	39
II	53	SHIPROCK	SL	1	47
II	57	SHIPROCK	SL	4	59
II	62	SHIPROCK	SL	1	44

TABLE 8-C-24 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	8	SHIPROCK	SL	2	60
III	12	SHIPROCK	SL	1	75
III	19	SHIPROCK	SL	4	60
III	20	SHIPROCK	SL	4	60
III	21	SHIPROCK	SL	4	60
III	23	SHIPROCK	SL	4	60
III	57	SHIPROCK	SL	2	22
III	86	SHIPROCK	SL	8	47
III	87	SHIPROCK	SL	8	79
III	88	SHIPROCK	SL	8	45
III	89	SHIPROCK	SL	4.5	79
III	90	SHIPROCK	SL	3	28
III	91	SHIPROCK	SL	1	34
III	97	SHIPROCK	SL	3.5	46
III	107	SHIPROCK	SL	5.5	56
III	109	SHIPROCK	SL	4.5	59
III	119	SHIPROCK	SL	1	59
III	127	SHIPROCK	SL	4.5	33
III	131	SHIPROCK	LS	2.5	47
III	132	SHIPROCK	LS	2.5	30
III	150	SHIPROCK	SL	2.5	46
III	151	SHIPROCK	SL	6	69
III	167	SHIPROCK	SL	3.5	35
III	178	SHIPROCK	SL	8	45
III	195	SHIPROCK	SL	2.5	30
III	204	SHIPROCK	SL	1.5	47
III	221	SHIPROCK	SL	6	12
III	238	SHIPROCK	SL	2.5	26
III	255	SHIPROCK	LS	4	36
III	275	SHIPROCK	SL	1	71
III	352	SHIPROCK	SL	3	67
III	353	SHIPROCK	SL	5	69
III	366	SHIPROCK	SL	1.5	69
III	367	SHIPROCK	SL	0.5	75
III	372	SHIPROCK	SL	3	71
III	373	SHIPROCK	SL	0.5	67
III	375	SHIPROCK	SL	0.5	75
III	377	SHIPROCK	SL	1.5	70

TABLE 8-C-24 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	378	SHIPROCK	SL	1	69
III	379	SHIPROCK	SL	1	75
III	390	SHIPROCK	LS	2	72
III	403	SHIPROCK	LS	0.5	36
III	409	SHIPROCK	LS	5	58
III	410	SHIPROCK	LS	0.5	69
III	456	SHIPROCK	SL	2	54
III	461	SHIPROCK	SL	1	79
III	471	SHIPROCK	SL	0.5	79
III	473	SHIPROCK	LS	4.5	69
IV	1	SHIPROCK	SL	4	59
IV	2	SHIPROCK	SL	4	63
IV	3	SHIPROCK	SL	3	68
IV	4	SHIPROCK	SL	3.5	31
IV	6	SHIPROCK	SL	1	31
IV	18	SHIPROCK	SL	3	42
IV	25	SHIPROCK	SL	1	44
IV	37	SHIPROCK	SL	4	41
IV	49	SHIPROCK	SL	9	33
IV	56	SHIPROCK	SL	7	79
IV	64	SHIPROCK	SL	3	79
IV	109	SHIPROCK	SL	4	33
IV	127	SHIPROCK	SL	2	51
IV	149	SHIPROCK	SL	1	34
IV	162	SHIPROCK	SL	1.5	34
IV	163	SHIPROCK	SL	1	14
IV	169	SHIPROCK	SL	1.5	33
IV	182	SHIPROCK	LS	1	26
IV	184	SHIPROCK	SL	1	29
IV	191	SHIPROCK	SL	2.5	29
IV	196	SHIPROCK	SL	1.5	79
IV	203	SHIPROCK	SL	2.5	63
IV	204	SHIPROCK	SL	5.5	17
IV	205	SHIPROCK	SL	9.5	18
IV	206	SHIPROCK	SL	3	16
IV	251	SHIPROCK	LS	2	47
IV	261	SHIPROCK	SL	3	20
IV	288	SHIPROCK	SL	5	79

TABLE 8-C-24 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	289	SHIPROCK	SL	4	33
IV	292	SHIPROCK	SL	4	35
IV	293	SHIPROCK	SL	4	10
IV	294	SHIPROCK	SL	4	4
IV	418	SHIPROCK	LS	1	67
IV	438	SHIPROCK	SL	1	14
IV	439	SHIPROCK	SL	1	20
IV	440	SHIPROCK	SL	1	24
IV	443	SHIPROCK	LS	1	20
IV	444	SHIPROCK	LS	1	24
IV	447	SHIPROCK	LS	2	20
IV	449	SHIPROCK	LS	3	59
IV	456	SHIPROCK	LS	2	8
IV	460	SHIPROCK	LS	5	39
IV	533	SHIPROCK	LS	3	18
IV	563	SHIPROCK	LS	2	10
IV	605	SHIPROCK	LS	3	43
IV	618	SHIPROCK	LS	3	18
IV	619	SHIPROCK	LS	1	4
IV	620	SHIPROCK	LS	3	20
EQ7/8	3	SHIPROCK	SL	18	79
EQ7/8	5	SHIPROCK	SL	14	79
EQ7/8	6	SHIPROCK	SL	5	79
EQ7/8	7	SHIPROCK	SL	3	79
EQ7/8	8	SHIPROCK	SL	7	69
EQ7/8	9	SHIPROCK	SL	2	49
EQ7/8	12	SHIPROCK	SL	2	79
EQ7/8	13	SHIPROCK	SL	2	79
EQ7/8	14	SHIPROCK	SL	2	79
EQ7/8	18	SHIPROCK	SL	2	79
EQ7/8	20	SHIPROCK	LS	1	71
EQ7/8	21	SHIPROCK	LS	1	45
EQ7/8	22	SHIPROCK	LS	1	10
EQ7/8	23	SHIPROCK	LS	1	20
EQ7/8	25	SHIPROCK	LS	1	20
EQ9	1	SHIPROCK	LS	4	55
EQ9	8	SHIPROCK	SL	1	39
EQ9	26	SHIPROCK	LS	1	59

TABLE 8-C-24 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
	EQ13	14 SHIPROCK	SL	1	79
	EQ13	15 SHIPROCK	SL	2	43
	EQ15	1 SHIPROCK	LS	0	79
	EQ15	2 SHIPROCK	SL	2	79
	EQ15	6 SHIPROCK	LS	2	25
	EQ15	7 SHIPROCK	LS	1	50
	EQ15	9 SHIPROCK	LS	2	79
	EQ15	10 SHIPROCK	LS	1	79
	EQ15	12 SHIPROCK	LS	4	79
	EQ15	14 SHIPROCK	LS	2	49
	EQ15	18 SHIPROCK	LS	2	67
	EQ15	19 SHIPROCK	LS	3	47
	EQ15	20 SHIPROCK	SL	4	20
	EQ15	21 SHIPROCK	LS	3	4
	EQ15	22 SHIPROCK	LS	4	57
	EQ15	23 SHIPROCK	LS	2	71
	EQ25	7 SHIPROCK	SL	5	69
	EQ25	12 SHIPROCK	LS	6	57
	EQ25	24 SHIPROCK	LS	5	71
	EQ25	25 SHIPROCK	LS	4	41
	EQ25	26 SHIPROCK	LS	2	51
BLOCK B	2	SHIPROCK	SCL	2	37
BLOCK B	3	SHIPROCK	LS	2	55
BLOCK B	4	SHIPROCK	SCL	1	75
BLOCK B	7	SHIPROCK	LS	2	57
BLOCK B	8	SHIPROCK	SL	2	47
BLOCK B	19	SHIPROCK	FSL	2	10
BLOCK B	20	SHIPROCK	SL	5	75
BLOCK B	25	SHIPROCK	SL	1	59
BLOCK B	40	SHIPROCK	LS	2	98
BLOCK B	41	SHIPROCK	SL	2	31
BLOCK B	46	SHIPROCK	S	2	49
BLOCK B	54	SHIPROCK	LS	1	98
BLOCK B	55	SHIPROCK	LS	1	98
BLOCK B	59	SHIPROCK	LS	2	79
BLOCK B	60	SHIPROCK	LS	2	110
BLOCK B	62	SHIPROCK	S	2	79
BLOCK B	66	SHIPROCK	LS	2	98

TABLE 8-C-24 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
BLOCK B	67	SHIPROCK	LS	2	98
BLOCK B	68	SHIPROCK	LS	3	98
BLOCK B	69	SHIPROCK	LS	3	98
BLOCK B	71	SHIPROCK	LS	1	59
BLOCK B	72	SHIPROCK	LS	1	54
BLOCK B	74	SHIPROCK	LS	2	28
BLOCK B	75	SHIPROCK	LS	2	25
BLOCK B	76	SHIPROCK	LS	1	98
BLOCK B	77	SHIPROCK	LS	2	24
BLOCK B	78	SHIPROCK	LS	2	98
BLOCK B	106	SHIPROCK	LS	5	47
BLOCK B	107	SHIPROCK	LS	5	79
BLOCK B	108	SHIPROCK	LS	5	118
BLOCK B	109	SHIPROCK	LS	3	106
BLOCK B	112	SHIPROCK	SL	2	20
BLOCK B	113	SHIPROCK	SL	2	31
BLOCK B	118	SHIPROCK	FSL	1	33
BLOCK B	119	SHIPROCK	LS	2	41
BLOCK B	127	SHIPROCK	LS	3	49
BLOCK B	141	SHIPROCK	LS	3	45

TABLE 8-C-25. Sample characteristics of the Shiprock Variant soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	8	SHIPROCK VARIANT	LS	0.5	60
I	157	SHIPROCK VARIANT	GSL	4	28
III	9	SHIPROCK VARIANT	SL	1	69
III	10	SHIPROCK VARIANT	SL	1	75
III	14	SHIPROCK VARIANT	LS	1	60
III	15	SHIPROCK VARIANT	SL	2	60
III	16	SHIPROCK VARIANT	SL	2	60
III	17	SHIPROCK VARIANT	SL	1.5	60
III	18	SHIPROCK VARIANT	SL	2	60
III	22	SHIPROCK VARIANT	SL	4	16
III	368	SHIPROCK VARIANT	SL	0	75
III	369	SHIPROCK VARIANT	SL	0.5	63
III	370	SHIPROCK VARIANT	SL	0.5	74
III	371	SHIPROCK VARIANT	SL	1.5	79
III	374	SHIPROCK VARIANT	SL	0.5	63
III	376	SHIPROCK VARIANT	SL	0.5	75
III	412	SHIPROCK VARIANT	LS	3	41
IV	263	SHIPROCK VARIANT	SL	4	33
IV	280	SHIPROCK VARIANT	SL	3	22
IV	283	SHIPROCK VARIANT	SL	4	28
IV	291	SHIPROCK VARIANT	SL	4	16
IV	301	SHIPROCK VARIANT	SL	2	14
IV	417	SHIPROCK VARIANT	SL	1	17
IV	466	SHIPROCK VARIANT	SL	2	31
EQ7/8	11	SHIPROCK VARIANT	SL	2	89
EQ9	12	SHIPROCK VARIANT	LS	4	24
EQ10	10	SHIPROCK VARIANT	LS	3	30
EQ15	11	SHIPROCK VARIANT	LS	4	54
BLOCK B	79	SHIPROCK VARIANT	LS	2	88

TABLE 8-C-26. Sample characteristics of the Stumble soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	158	STUMBLE	LS	6	47
III	159	STUMBLE	LS	3	20
III	160	STUMBLE	LS	1	35
IV	48	STUMBLE	SL	11	83
IV	65	STUMBLE	LS	6	79
IV	240	STUMBLE	SCL	0.5	69
IV	628	STUMBLE	S	5	10
IV	705	STUMBLE	S	10	83
EQ7/8	4	STUMBLE	S	7	79
EQ9	17	STUMBLE	S	4	43
EQ9	18	STUMBLE	S	5	79
EQ15	36	STUMBLE	S	12	4
BLOCK B	65	STUMBLE	LS	3	79

TABLE 8-C-27. Sample characteristics of the Trail soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
II	21	TRAIL	SL	5	6
II	22	TRAIL	SL	5	0
III	63	TRAIL	LS	2	0
III	64	TRAIL	LS	1	8
III	73	TRAIL	SCL	20	8
III	168	TRAIL	SL	3	6
III	198	TRAIL	LS	14	10
III	199	TRAIL	LS	3	0
III	206	TRAIL	LS	10	0
III	405	TRAIL	SL	0	4
III	406	TRAIL	SL	1	12
III	411	TRAIL	LS	2	8
IV	241	TRAIL	LS	1	20
IV	253	TRAIL	SL	3	7
IV	487	TRAIL	S	0	0
IV	504	TRAIL	LS	1	6
IV	762	TRAIL	LS	3	6
IV	763	TRAIL	LS	3	4
IV	764	TRAIL	SL	3	10
EQ7/8	17	TRAIL	SL	3	79
EQ13	5	TRAIL	SL	8	26
EQ15	38	TRAIL	S	11	67
EQ15	39	TRAIL	S	5	79
EQ15	40	TRAIL	S	10	79
EQ15	41	TRAIL	S	7	79
EQ15	43	TRAIL	S	10	12
EQ15	44	TRAIL	S	13	8
EQ15	45	TRAIL	S	10	78
EQ15	46	TRAIL	S	10	94
EQ15	47	TRAIL	SCL	5	0
EQ15	48	TRAIL	S	6	8
EQ15	49	TRAIL	S	5	24
EQ15	50	TRAIL	LS	7	94
EQ15	51	TRAIL	LS	8	79
EQ15	52	TRAIL	LS	6	12
EQ15	53	TRAIL	LS	7	18
EQ15	54	TRAIL	LS	8	16
EQ15	55	TRAIL	LS	5	0

TABLE 8-C-27 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
	EQ15	56 TRAIL	S	3	20
	EQ15	57 TRAIL	LS	3	79
	EQ15	60 TRAIL	S	1	75
	EQ15	61 TRAIL	LS	2	89
	EQ15	62 TRAIL	LS	2	79
	EQ15	63 TRAIL	LS	4	16
	EQ15	65 TRAIL	LS	3	28
	EQ15	66 TRAIL	S	3	16
	EQ15	67 TRAIL	CL	4	0
	EQ15	68 TRAIL	LS	1	35
	EQ15	73 TRAIL	SL	2	10
BLOCK B	27	TRAIL	LS	2	98
BLOCK B	28	TRAIL	LS	3	75
BLOCK B	29	TRAIL	S	2	69
BLOCK B	30	TRAIL	S	3	45
BLOCK B	99	TRAIL	LS	2	26
BLOCK B	104	TRAIL	LS	2	35
BLOCK B	115	TRAIL	LS	3	35
BLOCK B	116	TRAIL	LS	5	41

TABLE 8-C-28. Sample characteristics of the Tsaya soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	344	TSAYA	GSL	2	0
IV	557	TSAYA	SL	3	4
IV	569	TSAYA	SL	8	4
IV	734	TSAYA	GSCL	2	0

TABLE 8-C-29. Sample characteristics of the Uffens soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	3	UFFENS	LS	1.5	10
I	5	UFFENS	LS	2	14
I	10	UFFENS	SCL	0	0
I	16	UFFENS	SCL	3	0
I	17	UFFENS	SCL	3	0
I	29	UFFENS	SCL	0	4
I	30	UFFENS	SCL	0	0
I	81	UFFENS	SL	0.5	11
I	89	UFFENS	SL	1	6
I	98	UFFENS	SCL	1	0
I	112	UFFENS	SCL	1	2
I	113	UFFENS	SCL	1	0
I	114	UFFENS	SCL	1	0
I	119	UFFENS	SCL	1.5	0
I	125	UFFENS	CL	1.5	6
I	126	UFFENS	CL	1.5	0
I	131	UFFENS	SCL	5	0
I	132	UFFENS	SCL	1	0
I	144	UFFENS	CL	1.5	0
I	147	UFFENS	CL	2	0
I	149	UFFENS	CL	1.5	0
II	2	UFFENS	SCL	2.5	0
II	3	UFFENS	SCL	0.5	0
II	4	UFFENS	SCL	3	0
II	9	UFFENS	CL	0.5	6
II	17	UFFENS	SCL	1.5	2
II	18	UFFENS	SCL	1.5	0
II	20	UFFENS	SCL	5	0
II	24	UFFENS	CL	1.5	4
III	1	UFFENS	SL	1.5	0
III	3	UFFENS	SCL	2	4
III	13	UFFENS	SCL	0.5	0
III	39	UFFENS	SCL	0.5	3
III	40	UFFENS	CL	0.5	0
III	51	UFFENS	SCL	1	6
III	52	UFFENS	SL	1	5
III	53	UFFENS	SL	4	5
III	55	UFFENS	SL	4	6

TABLE 8-C-29 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	65	UFFENS	SCL	0	0
III	66	UFFENS	SL	1	0
III	80	UFFENS	SL	2.5	0
III	98	UFFENS	SCL	5	0
III	99	UFFENS	LS	10	6
III	100	UFFENS	SL	6	4
III	103	UFFENS	CL	3	0
III	108	UFFENS	SL	1	4
III	111	UFFENS	SCL	1.5	4
III	112	UFFENS	SCL	1	0
III	116	UFFENS	SL	5.5	6
III	117	UFFENS	SCL	6.5	5
III	120	UFFENS	SCL	4	0
III	128	UFFENS	SL	4.5	0
III	133	UFFENS	SCL	5.5	0
III	141	UFFENS	SL	2	0
III	143	UFFENS	SCL	2	0
III	145	UFFENS	CL	2	0
III	148	UFFENS	SL	5	0
III	153	UFFENS	SCL	1	4
III	163	UFFENS	SL	8	0
III	170	UFFENS	SCL	0	0
III	171	UFFENS	SCL	4	4
III	172	UFFENS	SCL	9	0
III	175	UFFENS	SL	0	10
III	180	UFFENS	SL	1	0
III	190	UFFENS	SCL	1	5
III	191	UFFENS	SCL	1	0
III	193	UFFENS	CL	1	0
III	194	UFFENS	SL	2.5	0
III	197	UFFENS	SL	0	0
III	200	UFFENS	SCL	1.5	0
III	201	UFFENS	SCL	1.5	0
III	202	UFFENS	SCL	1.5	6
III	203	UFFENS	SL	1.5	10
III	212	UFFENS	SCL	1	0
III	213	UFFENS	CL	1	0
III	215	UFFENS	SCL	0	0

TABLE 8-C-29 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	219	UFFENS	SCL	1	0
III	223	UFFENS	SCL	1	0
III	235	UFFENS	CL	8.5	0
III	245	UFFENS	CL	0.5	0
III	248	UFFENS	CL	1	0
III	249	UFFENS	SCL	2	3
III	250	UFFENS	CL	0	0
III	251	UFFENS	CL	1	0
III	261	UFFENS	CL	0	0
III	262	UFFENS	C	0	0
III	263	UFFENS	C	0	0
III	264	UFFENS	C	0	0
III	271	UFFENS	CL	0	0
III	305	UFFENS	CL	5	0
III	306	UFFENS	CL	5	0
III	314	UFFENS	SCL	0.5	3
III	320	UFFENS	CL	0.5	4
III	321	UFFENS	SCL	0.5	4
III	322	UFFENS	CL	0.5	4
III	323	UFFENS	CL	1	4
III	324	UFFENS	SCL	3	4
III	354	UFFENS	SCL	0.5	0
III	355	UFFENS	SCL	1	0
III	360	UFFENS	C	0	0
III	362	UFFENS	C	0	0
III	363	UFFENS	C	0	0
III	364	UFFENS	CL	0	0
III	365	UFFENS	SCL	1.5	0
III	380	UFFENS	SL	1	0
III	381	UFFENS	CL	0	0
III	391	UFFENS	CL	0	0
III	392	UFFENS	SL	0.5	0
III	404	UFFENS	CL	0	0
III	416	UFFENS	CL	0.5	0
III	417	UFFENS	CL	0.5	0
III	421	UFFENS	SCL	1	0
III	430	UFFENS	SL	1.5	0
III	431	UFFENS	CL	0.5	0

TABLE 8-C-29 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
III	432	UFFENS	LS	0.5	8
III	437	UFFENS	LS	1	12
III	438	UFFENS	LS	1	8
III	439	UFFENS	LS	1	8
III	442	UFFENS	LS	1.5	14
III	445	UFFENS	SCL	1	0
III	455	UFFENS	CL	1	0
III	458	UFFENS	SCL	0.5	0
III	467	UFFENS	CL	1	0
III	468	UFFENS	CL	1	0
III	472	UFFENS	SL	2	0
III	474	UFFENS	SCL	6	0
III	475	UFFENS	SCL	8	0
III	477	UFFENS	SCL	1.5	0
III	478	UFFENS	SCL	12	0
IV	22	UFFENS	CL	0.5	0
IV	24	UFFENS	CL	1	0
IV	79	UFFENS	CL	0.5	0
IV	80	UFFENS	SCL	1	0
IV	86	UFFENS	CL	0.5	0
IV	104	UFFENS	SL	4	10
IV	161	UFFENS	SL	0.5	0
IV	177	UFFENS	CL	0.5	0
IV	213	UFFENS	SCL	3	0
IV	217	UFFENS	SCL	1	0
IV	219	UFFENS	SICL	1.5	0
IV	221	UFFENS	SL	2	0
IV	226	UFFENS	SL	1	0
IV	235	UFFENS	CL	1.5	0
IV	238	UFFENS	SCL	0.5	0
IV	242	UFFENS	GSL	1.5	0
IV	267	UFFENS	SL	3	4
IV	270	UFFENS	CL	2	0
IV	276	UFFENS	SL	2	6
IV	360	UFFENS	SL	1	8
IV	378	UFFINS	SCL	1	0
IV	653	UFFENS	S	1	10
IV	654	UFFENS	SCL	1	0

TABLE 8-C-29 (cont)

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
IV	655	UFFENS	S	2	20
IV	657	UFFENS	S	2	8
IV	730	UFFENS	CL	1	0
IV	753	UFFENS	SCL	1	0
EQ15	71	UFFENS	SCL	4	0
BLOCK B	11	UFFENS	SCL	3	8
BLOCK B	83	UFFENS	LS	2	22

TABLE 8-C-30. Sample characteristics of the Wingrock soil series.

Area	Site #	Series Name	Surface Texture	Slope %	Topdressing Thickness
I	156	WINGROCK	SL	3	8
I	162	WINGROCK	SL	3	8
IV	478	WINGROCK	SL	3	14
IV	479	WINGROCK	LS	2	28
IV	480	WINGROCK	SL	3	15
IV	498	WINGROCK	SL	1	20
IV	545	WINGROCK	LS	1	8
EQ9	15	WINGROCK	LS	6	43

APPENDIX 8-D

AVAILABILITY OF TOPDRESSING MATERIAL BY MINE AREA.

TABLE	AREA
TABLE 8-D-1	Area I
TABLE 8-D-2	Area II
TABLE 8-D-3	Area II (Block B)
TABLE 8-D-4	Area III
TABLE 8-D-5	Area IV
TABLE 8-D-6	Area E-5/E-6
TABLE 8-D-7	Area E-7/E-8
TABLE 8-D-8	Area E-9
TABLE 8-D-9	Area E-10
TABLE 8-D-10	Area E-11/E-12
TABLE 8-D-11	Area E-13
TABLE 8-D-12	Area E-15
TABLE 8-D-13	Area E-25
TABLE 8-D-14	Area II (Block C)

TABLE 8-D-1. Availability of Topdressing material by mapping delineation for reclamation in Area I.

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Jc	120.0	30.19	487065	85, 92, 93, 94, 138, 139, 140, 141
Ra	100.0	11.59	155821	86, 87, 97, 137
Sl	75.0	15.15	152763	98, 99, 100, 135, 136
Ra	100.0	10.73	144259	4, 90, 108, 129
Ms	75.0	11.36	114547	7, 142, 143
Ra	70.0	12.00	112933	88, 101, 102, 134
Sc	70.0	10.50	98817	37, 38
Ms	46.0	14.36	88809	9, 65, 66, 67, 72
Sl	80.0	7.92	85184	6, 83, 84
Mn	100.0	5.83	78381	13, 14
Bb	11.8	44.70	70914	152, 153, 154, 155, 156, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171
Mn	55.0	9.29	68694	33, 34, 39
Sc	40.7	10.62	58111	157, 158, 159
Mv	36.0	11.25	54450	54, 61, 62
Mn	49.0	8.25	54349	11, 26, 27, 28, 45, 46
Ms	52.0	7.61	53202	47, 48, 74
Ms	60.0	5.91	47674	70, 71
Ra	85.0	4.11	46968	60, 82
Ms	75.0	4.30	43358	-
Rh	30.0	10.39	41906	128
Ra	59.0	4.84	38392	19
Mn	68.0	4.09	37392	35, 36
Sl	100.0	2.78	37376	95, 96
Mn	80.0	3.14	33772	43
Mv	39.0	5.98	31355	56, 57, 59
Ms	80.0	2.60	27964	73
Ra	80.0	2.37	25491	49, 75
Bb	11.8	15.20	24114	-
Mn	87.0	2.00	23393	24
Sc	80.0	2.09	22479	23
Ra	80.0	1.92	20651	51, 77
Rl	80.0	1.83	19683	44
Ra	36.0	4.03	19505	63, 68
Jc	39.0	3.16	16569	105

TABLE 8-D-1 cont:

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Ms	60.0	2.03	16375	-
Rh	33.0	3.56	15795	106,107
Rh	26.0	4.43	15485	12,32
Ms	59.0	1.93	15309	76
Sc	40.0	2.46	13229	-
Ms	36.0	2.72	13165	52
Rh	12.0	6.56	10583	21,22
Sh	22.0	2.93	8666	133
Ra	60.0	1.03	8309	53
Ra	60.0	1.03	8309	1
Fa	8.0	7.46	8024	150,151
Sh	26.0	2.13	7446	25
Rh	28.0	1.49	5609	103,104
Sh	37.0	0.75	3731	116
Ra	60.0	0.45	3630	-
Sl	22.0	1.15	3401	110
Sh	26.0	0.74	2587	-
Ms	22.0	0.53	1568	79
Nv	12.0	0.56	903	50
Nv	12.0	0.43	694	-
Nv	11.0	0.38	562	81
Nt	0.0	92.23	0	111,112,113,114,115,117, 118,118,120,121,122,123, 124,125,126,127
Nt	0.0	69.25	0	15,16,17,18,20
Ba	0.0	41.26	0	-
Ba	0.0	34.32	0	-
Ba	0.0	33.86	0	-
Nt	0.0	20.66	0	144,145,146,147,149
Ba	0.0	19.51	0	-
Ba	0.0	18.14	0	-
Ba	0.0	17.50	0	-
Nt	0.0	13.89	0	5,89,130,131,132
Nt	0.0	12.80	0	148
Ba	0.0	12.68	0	-
Nt	0.0	10.90	0	-
Ba	0.0	9.99	0	-
Ba	0.0	9.12	0	-

TABLE 8-D-1 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Ba	0.0	7.63	0	-
Nt	0.0	5.38	0	-
Nt	0.0	5.15	0	10,69
Nt	0.0	5.02	0	29,30,31,32
Ba	0.0	4.48	0	-
Nt	0.0	4.21	0	64
Ba	0.0	4.02	0	-
Nt	0.0	3.70	0	-
Nt	0.0	3.65	0	40
Nt	0.0	3.46	0	58
Nt	0.0	3.31	0	55
Nt	0.0	3.16	0	109
Ba	0.0	2.98	0	-
Nt	0.0	2.45	0	-
Nt	0.0	1.71	0	80
Nt	0.0	1.09	0	-
Ba	0.0	1.08	0	-
Nt	0.0	0.98	0	-
Nt	0.0	0.98	0	-
Nt	0.0	0.97	0	-
Ba	0.0	0.36	0	-
Nt	0.0	0.85	0	78
Ba	0.0	0.46	0	-
Nt	0.0	0.46	0	-
Nt	0.0	0.46	0	2
TOTAL		831.45	2599722	

TABLE 8-D-2 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Nt	0.0	8.64	0	NB-5,6
Ba	0.0	7.34	0	-
Nt	0.0	7.27	0	-
Ba	0.0	5.42	0	-
Ba	0.0	3.98	0	-
Ba	0.0	3.58	0	-
Nt	0.0	3.10	0	-
Ba	0.0	2.72	0	-
Nt	0.0	2.60	0	24
Ba	0.0	2.54	0	-
Ba	0.0	2.52	0	-
Nt	0.0	1.53	0	65
Nt	0.0	1.36	0	-
Ba	0.0	1.20	0	-
Nt	0.0	1.18	0	-
Nt	0.0	0.74	0	54
Ba	0.0	0.69	0	-
Ba	0.0	0.46	0	-
Ba	0.0	0.41	0	-
TOTAL		619.37	1019585	

TABLE 8-D-2. Availability of Topdressing material by mapping delineation for reclamation in Area II.

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Jc	80.0	15.82	170153	25,26,27,28,29
Ra	70.0	14.05	132226	5,38
Sc	60.0	13.09	105593	39,40,41,47,48,49
Sc	85.0	7.39	84451	62
Ra	80.0	7.31	78623	59,60,61
Ra	85.0	5.77	65938	68,69
Mn	76.0	5.40	55176	57,58
Ra	80.0	5.00	53778	NB-1,2,3
Ra	85.0	3.19	36455	63,64
Rl	71.0	3.51	33505	55,56
Sc	80.0	2.97	31944	11,12,13
Ms	55.0	4.19	30983	14,15,16
Sh	26.0	6.24	21812	34,35,36
Ra	70.0	2.25	21175	-
Ra	56.0	2.63	19801	66,67
Nv	12.0	11.83	19086	17,18,19,20,21,22
Ra	80.0	1.49	16026	NB-4,5
Ms	100.0	1.00	13444	23
Ra	80.0	0.91	9788	-
Sc	60.0	1.10	8873	-
Ra	100.0	0.40	5378	10
Sc	80.0	0.50	5378	-
Ba	0.0	117.40	0	-
Ba	0.0	40.49	0	-
Ba	0.0	36.94	0	-
Nt	0.0	35.90	0	-
Nt	0.0	32.20	0	42,43,44,45,46,50,51,52
Ba	0.0	29.14	0	-
Ba	0.0	22.72	0	-
Nt	0.0	21.71	0	30,31,32,33,37
Ba	0.0	21.35	0	-
Nt	0.0	16.59	0	1,2,3,4
Nt	0.0	16.30	0	-
Ba	0.0	15.27	0	-
Ba	0.0	14.70	0	-
Nt	0.0	14.32	0	8
Ba	0.0	11.02	0	-

TABLE 8-D-3. Availability of Topdressing material by mapping delineation for reclamation in Area II (Block B).

Map Delin.	Depth (inches)	Acres	Cubic Yards	Samples Site
Ms	69.3	25.80	240483	71, 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 87, 88, 89, 97, 98, 107, 108, 109, 120
Sc	95.6	12.50	106577	54, 55, 57, 58, 59, 60, 61, 62, 65, 66, 67, 68, 69
Sc	56.9	10.00	76539	2, 3, 4, 5, 7, 8, 14, 19, 20, 25,
Ms	73.2	5.80	57041	46, 50, 51, 52, 53, 56
Ra	122.8	3.40	56149	105, 114, 117
Nv	26.8	13.20	47508	99, 101, 102, 104, 112, 113, 115, 116, 118, 119
Fa	13.6	25.50	46750	85, 90, 91, 92, 93, 94, 95, 96, 133, 137, 138, 139, 140, 141, 142, 143
Bb	22.4	14.40	43289	110, 111, 121, 122, 123, 124, 125, 126, 131, 132, 134, 135, 136
Sc	58.4	4.50	35326	40, 41, 42
Fa	13.3	19.60	34968	43, 43A, 44, 44A
Ra	98.4	2.00	26467	45
Sc	75.8	2.10	21398	100, 106
Ta	65.9	2.00	17732	15, 16
Th	60.0	2.00	16144	28, 30
Jc	78.7	1.07	11327	-
Nv	28.4	2.70	10291	63, 64, 83
Bb	23.8	2.30	8959	84, 86
Sc	49.9	1.00	6710	127
Ta	113.2	0.36	5478	27, 29
Sc	75.8	0.40	4076	-
Nv	13.0	2.30	4017	47, 48, 49
Nt	5.9	4.70	3732	6, 11, 12
Jc	78.7	0.2	2116	-
Nv	14.6	1.00	1959	130
Nt	3.7	3.74	1881	9, 10, 21, 22, 23, 24
Fa	13.4	0.80	1440	70, 70A, 73
Nt	2.4	3.20	1015	18, 26
Bb	3.9	0.71	376	17
Ba	0.0	133.33	0	-

TABLE 8-D-3 (cont)

Map Delin.	Depth (inches)	Acres	Cubic Yards	Samples Site
Ba	0.0	106.90	0	-
Ba	0.0	94.36	0	-
Ba	0.0	78.96	0	-
Ba	0.0	68.17	0	-
Nt	0.0	31.80	0	144, 145, 146, 147, 148
Ba	0.0	23.41	0	31
Ba	0.0	21.57	0	-
Ba	0.0	17.37	0	-
Nt	0.0	10.00	0	32, 33, 34, 35, 37
Nt	0.0	9.07	0	-
Nt	0.0	8.20	0	-
Ba	0.0	8.85	0	1
Ba	0.0	7.98	0	-
Ba	0.0	7.12	0	-
Ba	0.0	5.61	0	13
Nt	0.0	5.20	0	128, 129
Ba	0.0	5.18	0	-
Nt	0.0	3.80	0	-
Nt	0.0	3.70	0	103
Nt	0.0	2.50	0	-
Nt	0.0	2.50	0	-
Fa	0.0	1.60	0	-
Ba	0.0	1.62	0	-
Fa	0.0	1.20	0	-
Nt	0.0	0.80	0	38, 39
Fa	0.0	0.62	0	-
Nt	0.0	0.36	0	-
Ba	0.0	0.29	0	-
Ba	0.0	0.05	0	-
TOTAL		830.00	943747	

TABLE 8-D-4. Availability of Topdressing material by mapping delineation for reclamation in Area III.

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Ma	74.0	144.04	1433038	289,290,291,293,294,296,299,301,302,303,326,327,328,329,333,335,336,337,342,343,344,346,347,348,349,350,44,46,22,10
Sc	67.0	66.70	600819	19,20,21,23,366,367,372,373,375,377,378,379,390,409,410
Bb	16.0	238.03	512029	383,384,385,386,387,393,394,395,396,397,398,400,401,413,414,415,418,419,420,422,422,423,424,425,426,427,428,429,446,447,448,449,450,451,452,453,454,457,33,24,25,26,27,28,29,30,31,32,34,35,37,38
Ms	100.0	30.91	415568	134,135,71,72,77,78,79
Sv	67.0	43.73	393910	9,14,15,16,17,18,369,370,371,374
Rl	73.0	38.83	381095	300,325,330,331,332,339,340,341,5
Bc	68.0	35.78	327109	304,338,351,11
Jc	80.0	24.74	266092	106,126,136,73,75
Rl	83.0	17.37	193830	45,292,297,298
Ra	48.0	28.50	183920	125,137,138,139,140,161
Bh	35.0	39.00	183517	266,267,272,273,274,275,281,282,311,312
Jc	60.0	20.37	164318	2,4
Ra	70.0	16.18	152272	162,176,177,76,115
Bc	100.0	9.73	130814	113,114,155,156,157
Rl	60.0	13.40	108093	6,7
Bc	100.0	8.02	107824	104,105
Rl	79.0	9.84	104512	295
Sc	70.0	8.92	83947	352,353,12
Rl	73.0	8.28	81264	345
Jh	36.0	16.19	78360	-

TABLE 8-D-4 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Rv	27.0	20.99	76194	388,389,407,408
Bc	58.0	9.75	76028	119,144,146,147
Mv	30.0	15.13	61024	57,58,59,60,195,196
Ms	42.0	10.64	60081	127,130,131,132
Rl	75.0	5.70	57475	82,83,84,85,89
Ms	60.0	6.05	48803	150,151
Sc	55.0	6.34	46881	460,461
Ra	90.0	3.63	43923	222
Nv	10.0	32.19	43278	432,433,534,435,436,437, 438,439,442,443,444,445
Sc	77.0	4.09	42341	471,473
Ms	70.0	4.33	40750	-
Bh	12.0	25.13	40543	283,284,285,286,287,288
Nv	12.0	23.20	37429	51,52,53,55,202,203,206, 226
Ra	24.0	9.23	29782	67,68,69,70,179
Sc	50.0	4.41	29645	238,239
Rv	39.0	5.58	29258	246
Bh	37.0	5.48	27260	255,259,260
Jc	45.0	4.22	25531	101,142
Jh	12.0	15.72	25362	229,230,231,232,233,234, 236,237
Sl	48.0	3.69	23813	109,110
Sh	48.0	3.69	23813	109,110
Bc	30.0	5.63	22708	152,153
Sv	41.0	4.10	22600	412
Bh	31.0	4.60	19172	47,48,49
Rl	51.0	2.76	18924	25,399
Sh	32.0	4.25	18284	81,90,91
Sh	36.0	3.76	18198	402,403,456
Jc	60.0	2.09	16859	-
Bh	15.0	8.33	16799	276,277,313
Ms	43.0	2.89	16707	-
Ra	54.0	2.25	16335	228
Sz	40.0	2.90	15596	158,159,160
Nv	10.0	10.65	14318	163,164,175
Ms	43.0	2.37	13701	187
Sc	46.0	2.08	12864	97

TABLE 8-D-4 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Sc	67.0	1.33	11980	-
Sc	50.0	1.74	11697	-
Ra	80.0	1.08	11616	256
Rh	33.0	2.53	11225	74
Sc	50.0	1.58	10621	-
Bh	21.0	3.75	10588	257
Rh	23.0	3.19	9864	207
Ms	48.0	1.42	9164	204,205,54
Sc	42.0	1.61	9091	86,87,88
Ra	43.0	1.50	8672	227
Jc	45.0	1.40	8470	-
Bh	12.0	4.59	7405	258,265
Sc	56.0	0.97	7303	107
Sh	24.0	2.24	7228	221
Ms	60.0	0.84	6776	-
Ra	72.0	0.63	6098	463
Ra	57.0	0.78	5977	240
Bb	25.0	1.44	4840	149
Ms	43.0	0.54	3122	-
Bh	18.0	0.99	2396	254
Nv	10.0	1.49	2003	-
Sc	50.0	0.14	941	-
Ba	0.0	0.49	0	-
Nt	0.0	305.56	0	61,62,183,184,185,186, 188,189,190,191,192,193, 200,201,211,212,213,214, 42,43,479,480,481,482, 483,484,485,486,487,488, 489,490,491
Ba	0.0	0.40	0	-
Nt	0.0	2.08	0	455
Ba	0.0	4.00	0	-
Nt	0.0	24.08	0	108,111,112,128,129
Nt	0.0	15.50	0	261,262,263,264,271
Nt	0.0	1.78	0	-
Nt	0.0	0.67	0	-
Ba	0.0	17.97	0	-
Ba	0.0	1.69	0	-

TABLE 8-D-4 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Nt	0.0	6.40	0	235,247
Nt	0.0	33.00	0	241,242,243,244,245,248, 249,250,251,252,253
Nt	0.0	27.71	0	102,103,122,123,124,141
Nt	0.0	57.31	0	65,66,165,166,167,168, 170,171,172,180,224,225, 226
Ba	0.0	140.59	0	-
Ba	0.0	7.16	0	-
Nt	0.0	15.25	0	474,475,476,477,478
Ba	0.0	14.89	0	-
Ba	0.0	18.11	0	-
Nt	0.0	43.87	0	80,92,93,94,95,96,98,99, 100,118,120,121,143,145, 148
Ba	0.0	2.49	0	-
Ba	0.0	3.92	0	-
Nt	0.0	1.66	0	-
Nt	0.0	2.83	0	-
Ba	0.0	0.80	0	-
Ba	0.0	0.65	0	-
Nt	0.0	352.52	0	268,269,270,278,279,280, 305,306,307,308,309,310, 314,315,316,317,318,319, 320,321,322,323,324,354, 355,356,357,358,359,360, 361,362,363,364,365,13, 39,40,41,382,391,392, 421,430,431,462,464,465, 466,467,468,469,470
Ba	0.0	211.90	0	-
Nt	0.0	93.71	0	1,3,458,459
Nt	0.0	0.46	0	-
Ba	0.0	0.27	0	-
Nt	0.0	6.30	0	-
Nt	0.0	12.81	0	-

TABLE 8-D-4 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Nt	0.0	5.57	0	416,417
Ba	0.0	95.49	0	-
Nt	0.0	5.23	0	411
Nt	0.0	7.11	0	-
Nt	0.0	0.95	0	-
Nt	0.0	12.75	0	472
Nt	0.0	0.87	0	-
Nt	0.0	0.18	0	-
Nt	0.0	54.66	0	63,208,209,210,216,217, 218,219,220
Nt	0.0	2.02	0	-
Nt	0.0	81.22	0	-
Nt	0.0	0.71	0	-
TOTAL		2827.78	7201686	

TABLE 8-D-5. Availability of Topdressing material by mapping delineation for reclamation in Area IV.

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Jc	70.0	134.33	1264195	218,220,232,233,234,236,237,239,240,244,245
Bb	20.0	127.87	343828	7,9,10,11,12,13,14,16,17,18,19,20,21,23,26,28,29,30,31,33,37,38,39,40,41,42,43,44,45,52,53,60,61,62,69,70,71,72,73,76,77,78,87
Jc	65.0	29.88	261118	212,214,215,216
Rl	53.0	29.37	209278	66,67,74,75
Bb	14.0	76.04	143124	83,84,91,94,95,98,99,105,106,107,108,111,113,115,116,117,125,126,127,128,130,131,133,134,135,139,140,142,148,150,165,166,167,170,172,173,183
Ma	80.0	12.80	137671	46,51,54,63,68
Ms	80.0	12.45	133907	47,64
Rh	22.4	36.74	110645	595,596,597,628,629,632,633,634,611,612,608,609,603,585
Sc	55.0	13.77	101822	1,2,3,109,110
Sz	80.0	9.77	105082	48,65,250
Bb	13.5	48.90	88754	311,317,318,319,337,338,339,352,399,400,371,373,388,389,390,403
Ra	65.0	8.72	76203	493,494,495,502,503
Ms	72.0	7.40	71632	56,59
Ra	59.7	8.54	68545	598,599,610
Ms	57.6	8.09	62649	449,450,451,467
Bb	16.0	28.52	61350	186,187,188,190,192,198,200,201,202,204,205,206,208,209
Gr	16.2	24.02	52316	320,334,335,336,353,356,365,382,384
Ra	56.1	6.49	48950	583,584,586,606

TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Bb	17.0	20.02	45757	445,446,447,448,459,460, 461,464
Nv	5.8	58.53	45640	369,370,364,385,405,426, 427,413,435,414,415,424, 423,422,421,420,419,432, 433,434
Rl	50.0	6.54	43963	90,100,101,102
Bb	10.9	29.62	43406	308,309,310,312,343,345, 346,347,395,396,397,412, 413,414,393
Ra	47.0	6.48	40946	189,199,203
Ms	56.0	5.28	39753	191,196,197
Sh	31.0	9.47	39469	4,5,6,25
Sh	19.5	13.43	35209	289,291,292,293,294
Jh	17.7	14.23	33863	702,488
Ma	14.1	17.70	33553	354,355,366,367,368,383, 425
Ra	39.4	6.23	33001	593,594,615
Nv	9.3	26.15	32696	635,636,637,639,640,652, 653,655,656,657,590
Sv	29.5	7.76	30777	263,283,250
Nv	22.6	9.82	29838	591,592
Rh	30.0	7.12	28717	156,157,210,211
Bb	10.9	18.59	27243	431,440,441,442,452,453, 454,455,468,469
Rh	27.6	7.17	26605	550,551,552
Ra	66.9	2.80	25184	703,704,705
Na	13.8	13.12	24342	49,286,290
Sc	28.0	6.25	23528	141,149,163,182,184
Sh	18.7	9.34	23482	436,437,438,439,443,444
Fa	2.8	62.20	23415	557,558,567,568,569
Sc	66.9	2.58	23205	418
Rh	28.9	5.52	21448	313,314,342
Rl	51.2	3.02	20788	275
Mn	27.9	5.12	19205	372,374
Bb	13.0	10.76	18806	281,299
Fa	4.0	34.72	18672	119,120,121,122,123,124, 132,136,138,144,146,147, 151

TABLE 8-D-5 (cont.)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Rv	13.5	10.05	18241	391,392,402
Nv	9.5	13.52	17268	568,671,672,673,674,648
Sv	11.6	10.92	17030	416,417
Bb	15.0	8.25	16638	57,58
Bb	16.0	7.48	16090	176,179
Bb	15.1	7.83	15896	321,322,330,357
RI	40.0	2.93	15757	82
Ms	47.2	2.40	15230	251
Nv	17.7	6.23	14825	658,659
Bb	10.4	10.41	14555	476,481,482
Sv	19.0	5.52	14101	280,300,301
Gr	16.5	5.96	13221	272
Bb	8.5	11.56	13211	496,497,498,499,500,501,
Jh	11.1	8.36	12476	711,712,713
Bb	15.7	5.78	12200	616,617,638
Sh	14.6	5.96	11699	533,534,607
Sc	50.4	1.69	11451	287,288
Sh	13.8	5.96	11058	618,619,620
RI	30.7	2.67	11020	252
Fa	17.2	4.54	10498	477,478,479,480
Ms	51.2	1.51	10394	604,604
Fa	3.9	18.41	9653	307,344
Rv	14.8	4.80	9551	579
Fa	4.0	17.43	9373	15,32,34,35,36
Fa	4.0	17.39	9352	-
Nv	8.0	8.61	9261	228,229
RI	53.0	1.30	8907	-
Rv	30.0	2.18	8793	158
Nv	8.9	7.29	8723	625
Sv	31.5	2.01	8512	466
RI	55.0	1.15	8504	195
Fa	4.3	14.67	8481	508,509,523,525,526
Na	17.7	3.56	8472	471
RI	43.3	1.42	8266	398
Fa	4.0	15.05	8094	92,118,129,174,175
Rv	9.7	6.05	7890	324,325,326
Nv	6.2	9.43	7860	260,276,306,341
Na	10.8	5.25	7623	273,274

TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Sh	34.0	1.66	7588	162
Fa	4.0	13.97	7513	-
Ra	57.0	0.98	7510	-
Sh	11.1	4.89	7298	456,457,458
Rv	10.8	4.98	7231	548,549
Na	21.6	2.40	6970	279
Nv	7.1	7.21	6882	600
Ra	57.0	0.89	6820	-
Bb	6.8	7.38	6747	544,545,546
Sh	13.8	3.38	6271	561,562,563,564
Ma	78.0	0.55	5768	-
Bb	14.0	3.04	5722	-
Na	13.8	3.02	5603	262,284
Fa	4.0	10.04	5399	-
Nv	3.4	11.48	5248	492,504,505,506
Fa	4.0	9.70	5216	-
Rl	42.0	0.92	5195	88
Rh	18.0	2.12	5130	145
Nv	15.7	2.40	5066	666
Mn	21.6	1.60	4646	386
Fa	4.0	8.54	4593	50,55
Fa	4.0	8.49	4566	-
Bb	5.3	5.96	4247	559,560
Nv	5.9	5.34	4236	472,474
Rh	18.0	1.72	4162	160
Ra	49.2	0.62	4101	401
Rv	11.8	2.58	4093	348
Gr	15.7	1.69	3567	265
Fa	5.9	4.36	3458	535
Rv	22.0	1.15	3401	155
Nv	12.6	1.96	3320	714,715
Fa	11.8	2.05	3252	349
Fa	4.0	5.91	3178	181,185
Fa	3.9	5.87	3078	462
Th	4.4	4.80	2839	757,761,762,763
Fa	4.0	5.10	2743	-
Nv	3.9	5.21	2732	264,282
Rv	20.5	0.98	2701	404

Rv 20.5 0.98 2701 404
 TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Nv	5.9	3.29	2610	360,361
Nv	5.9	3.29	2610	613,614
Nv	5.9	3.29	2610	723,724
Nv	19.7	0.98	2596	716
Fa	4.0	4.71	2533	193
Nv	5.9	3.11	2467	750,752
Fa	3.9	4.45	2333	394
Fa	5.9	2.76	2189	483
Fa	4.0	4.07	2189	153,159
Nv	4.9	3.29	2167	350,351
Nv	5.9	2.49	1975	-
Nv	5.9	2.49	1975	-
Fa	4.0	3.56	1914	-
Fa	4.0	3.50	1882	-
Fa	4.0	3.44	1850	-
Th	7.1	1.78	1699	253
Nv	3.9	3.11	1631	267
Nv	16.1	0.71	1537	-
Nv	3.9	2.85	1494	463
Fa	4.0	2.47	1328	-
Sh	19.7	0.44	1165	261
Fa	3.9	2.22	1164	-
Fa	4.0	1.89	1016	-
Fa	4.0	1.89	1016	207
Fa	4.0	1.61	866	-
Nv	3.9	1.33	697	285
Nv	8.9	0.44	526	-
Fa	4.0	0.92	495	-
Fa	4.0	0.86	462	-
Fa	4.0	0.28	151	-
Bb	9.8	0.10	132	246
Nt	0.0	20.28	0	524
Nt	0.0	17.17	0	-
Nt	0.0	30.96	0	-
Ba	0.0	0.53	0	-
Nt	0.0	26.33	0	-
Ba	0.0	2.49	0	-

TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Ba	0.0	2.47	0	-
Nt	0.0	4.18	0	266
Nt	0.0	82.46	0	-
Ba	0.0	6.83	0	-
Nt	0.0	8.45	0	475
Ba	0.0	1.42	0	-
Nt	0.0	1.51	0	-
Ba	0.0	291.14	0	-
Fa	0.0	0.36	0	-
Nt	0.0	12.00	0	570, 571
Nt	0.0	190.96	0	295, 296, 254, 255, 256, 257, 258, 259, 268, 269, 270, 271, 277, 278, 302, 303, 304, 315, 316, 340, 298, 323, 327, 328, 329, 331, 332, 333, 358, 359, 362, 363, 378, 379, 380, 381, 406, 407, 408, 409, 410, 411, 412, 22, 29, 80, 85, 86, 89, 96, 97, 177, 178, 180
Nt	0.0	51.59	0	708, 709, 710
Nt	0.0	14.08	0	-
Nt	0.0	6.94	0	152
Ba	0.0	0.36	0	-
Jh	0.0	81.57	0	719, 720, 725, 726, 727, 728, 743, 749, 751, 754, 769, 770
Nt	0.0	25.87	0	219
Nt	0.0	2.22	0	-
Nt	0.0	5.16	0	-
Nt	0.0	4.53	0	154, 161, 164
Nt	0.0	1.35	0	-
Ba	0.0	92.75	0	-

TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Nt	0.0	286.16	0	487,491,490,489,696,697, 699,670,671,683,684,685, 686,687,688,689,690,691, 692,693,694,695,675,676, 677,678,679,680,681,682, 644,645,646,647,649,650, 651,654,660,661,662,627, 630,631,641,642,663,667, 669,670,622,623,626,510, 511,512,513,514,515,516, 517,518,519,520,521,522, 527,528,529,530,531,532, 536,537,538,539,540,542, 543,547,553,554,555,556, 565,572,573,574,575,576, 577,578
Nt	0.0	1.01	0	-
Nt	0.0	1.87	0	601,602
Nt	0.0	11.05	0	-
Nt	0.0	20.10	0	-
Ba	0.0	32.38	0	-
Ba	0.0	7.34	0	-
Nt	0.0	7.83	0	-
Nt	0.0	2.75	0	-
Ba	0.0	0.93	0	-
Nt	0.0	10.02	0	-
Nt	0.0	4.54	0	-
Nt	0.0	1.69	0	-
Ba	0.0	2.76	0	-
Nt	0.0	10.85	0	718
Fa	0.0	6.14	0	-
Ba	0.0	64.32	0	-
Nt	0.0	6.94	0	-
Nt	0.0	20.00	0	242,243
Ba	0.0	42.99	0	-
Fa	0.0	7.29	0	-
Ba	0.0	2.22	0	-
Nt	0.0	6.76	0	428,429,430

TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Ba	0.0	34.25	0	-
Nt	0.0	19.69	0	-
Fa	0.0	4.89	0	-
Nt	0.0	30.42	0	-
Ba	0.0	0.36	0	-
Nt	0.0	2.31	0	-
Nt	0.0	4.63	0	580,581,582
Nt	0.0	8.10	0	-
Ba	0.0	5.24	0	-
Nt	0.0	1.32	0	-
Nt	0.0	75.76	0	589,621,717,721,722
Nt	0.0	0.34	0	-
Ba	0.0	0.53	0	-
Nt	0.0	138.50	0	587,588,742,741,740,739, 738,736,735,734,733,732
Nt	0.0	5.43	0	-
Ba	0.0	1.78	0	-
Nt	0.0	119.36	0	230,231
Nt	0.0	6.76	0	-
Ba	0.0	0.98	0	-
Ba	0.0	76.15	0	-
Ba	0.0	1.60	0	-
Nt	0.0	0.62	0	-
Ba	0.0	0.71	0	-
Ba	0.0	68.59	0	-
Nt	0.0	38.43	0	235,238
Ba	0.0	6.56	0	-
Ba	0.0	62.70	0	-
Ba	0.0	4.18	0	-
Nt	0.0	0.62	0	-
Ba	0.0	23.48	0	-
Ba	0.0	15.72	0	-
Ba	0.0	12.45	0	-
Nt	0.0	5.69	0	706,707
Ba	0.0	27.21	0	-
Ba	0.0	2.73	0	-
Ba	0.0	304.27	0	-

TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Fa	0.0	6.94	0	470
Ba	0.0	0.53	0	-
Ba	0.0	1.96	0	-
Nt	0.0	74.05	0	222, 223, 224, 241
Nt	0.0	29.76	0	-
Nt	0.0	1.29	0	27
Ba	0.0	2.04	0	-
Nt	0.0	25.53	0	729, 730, 731, 737
Nt	0.0	13.49	0	-
Ba	0.0	0.71	0	-
Ba	0.0	5.16	0	-
Nt	0.0	4.82	0	-
Ba	0.0	6.67	0	-
Ba	0.0	30.87	0	-
Ba	0.0	23.66	0	-
Nt	0.0	0.53	0	-
Ba	0.0	17.24	0	-
Ba	0.0	15.92	0	-
Nt	0.0	1.97	0	213
Nt	0.0	9.07	0	-
Nt	0.0	9.18	0	-
Ba	0.0	0.18	0	-
Ba	0.0	309.17	0	-
Ba	0.0	100.91	0	-
Ba	0.0	0.98	0	-
Nt	0.0	3.46	0	-
Ba	0.0	156.75	0	-
Ba	0.0	0.33	0	-
Ba	0.0	3.60	0	-
Nt	0.0	179.13	0	756, 764, 765, 766, 767, 768, 744, 745, 746, 747, 748, 753, 755, 758, 759, 760, 225
Ba	0.0	493.27	0	-
Nt	0.0	20.20	0	246, 247, 248, 249
Ba	0.0	1.42	0	-
Nt	0.0	13.49	0	-
Ba	0.0	1.87	0	-

TABLE 8-D-5 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Ba	0.0	19.93	0	-
Ba	0.0	5.16	0	-
Ba	0.0	4.52	0	-
TOTAL		5816.03	4871123	

TABLE 8-D-6. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-5/6.

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Bb	9.6	7.74	9990	10,11,12,13,14,15
Gr	32.6	0.98	4295	9
Bb	7.4	4.04	4019	5,6,7,8
Ra	78.7	0.09	952	3
Ba	0.0	11.63	0	-
Nt	0.0	5.47	0	1,2,4
Ba	0.0	3.38	0	-
Nt	0.0	0.62	0	-
TOTAL		33.95	19257	

TABLE 8-D-7. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-7/8.

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Sc	71.8	20.10	194028	3,5,6,7,8,9, 10,11,12,13,14,18, 20
Ta	80.0	6.90	74213	15,16,17
Ra	75.5	3.20	32482	1,2
Sh	27.6	7.65	28387	21,22,23,24,25,26, 27
Sh	27.6	0.71	2635	19
Ra	75.5	0.17	1726	4
Nt	0.0	0.36	0	-
TOTAL		39.09	333469	

TABLE 8-D-8. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-9.

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Jc	61.8	57.99	481820	28,30,31,32,37,38, 39,46,47,48,42,43, 44,101,100,99,68,69
Jc	84.4	19.63	222744	56,57,58,59,62,67, 54,55
Ms	46.7	11.83	74275	1,8,9,17
Ra	93.5	5.50	69138	18,19,20,21
Mn	70.2	5.01	47284	2,7,11
Ms	73.8	4.17	41375	25,26
Ra	86.6	2.50	29107	52,53
Ra	59.3	3.38	26947	-
Bb	24.6	6.22	20572	3,4
Sc	23.6	6.14	19482	12
Gr	34.4	3.20	14800	6,15
Nv	5.9	13.22	10486	33,34,35,36
Ra	59.0	1.02	8091	-
Ra	59.3	0.80	6378	-
Fa	6.9	6.13	5687	5,14
Bb	13.1	2.58	4544	-
Fa	3.9	7.65	4011	-
Bb	14.4	1.91	3698	10,16
Nv	15.7	1.16	2449	27
Bb	11.8	1.15	1824	13
Rh	16.0	0.64	1377	106,107,108,109
Fa	3.9	1.78	933	-
Jh	0.0	57.50	0	60,61,63,64,65,66, 70,71,72,73,74,75, 76,77,78,79,80,81, 82,83,84,85,86,87, 88,89,90,91,92,93, 94,95,96,97,98
Ba	0.0	32.15	0	-
Nt	0.0	16.82	0	40,41,45,49,50,51,
Jh	0.0	13.85	0	22,23,24
Ba	0.0	2.98	0	-
Ba	0.0	2.76	0	-
Ba	0.0	2.18	0	-

TABLE 8-D-8 (cont)

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Nt	0.0	2.05	0	-
Ba	0.0	1.86	0	-
Nt	0.0	1.69	0	29
Ba	0.0	0.98	0	-
Ba	0.0	0.85	0	-
Ba	0.0	0.71	0	-
Ba	0.0	0.62	0	-
TOTAL		300.61	1097021	

TABLE 8-D-9. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-10.

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Bb	18.8	8.63	21813	4,5,6,7,8,9
Ms	41.3	2.13	11827	1,2,3,10
Ms	41.3	2.05	11383	-
Bb	18.8	1.42	3589	-
Ba	0.0	6.41	0	-
Nt	0.0	4.89	0	-
Nt	0.0	4.71	0	-
Ba	0.0	3.83	0	-
Nt	0.0	0.44	0	-
TOTAL		34.51	48612	

TABLE 8-D-10. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-11/12.

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Jc	72.2	5.78	56106	15,16,17
Jh	11.8	16.37	25970	18,19
Jc	32.8	2.58	11377	12,13,14
Jc	87.6	0.89	10482	1
Ra	59.0	0.98	7774	11
Ra	55.1	0.53	3926	8
Jh	6.9	3.98	3692	9,10
Ra	59.0	0.27	2142	6
Rh	23.6	0.62	1967	3
Fa	5.9	1.96	1555	4,5
Fa	9.8	0.89	1173	7
Fa	3.9	0.62	325	-
Fa	3.9	0.27	142	-
Ba	0.0	3.20	0	-
Ba	0.0	2.94	0	-
Nt	0.0	1.42	0	2
Ba	0.0	1.33	0	-
Ba	0.0	0.53	0	-
Ba	0.0	0.44	0	-
Ba	0.0	0.44	0	-
TOTAL		46.04	126630	

TABLE 8-D-11. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-13.

Map Delin. (inches)	Depth	Acres	Cubic Yards	Sample Site
Ms	52.6	7.21	50988	13,14,15,17
Ta	25.6	0.97	3339	5
Nt	0.0	15.39	0	1,2,9,10,11
Nt	0.0	11.21	0	16,3,4
Nt	0.0	9.25	0	12,18,6,7
Ba	0.0	7.65	0	-
Ba	0.0	2.31	0	-
Ba	0.0	2.31	0	-
Ba	0.0	1.78	0	-
Ba	0.0	1.69	0	-
Ba	0.0	0.89	0	-
Ba	0.0	0.45	0	-
TOTAL		61.11	54326	

TABLE 8-D-12. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-15.

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Ms	62.5	29.71	249647	1,2,3,4,5,7, 8,9,10,11,12,13, 14,15,16,18,19,23
Ta	81.2	13.79	150544	38,39,40,41,45,46, 50,51
Ta	74.0	10.94	108841	57,58,60,61,62
Th	10.8	28.91	41977	43,44,47,49,48,63, 65,66,67,52,53,54, 36,37,55,56,59
Jc	78.7	3.65	38620	28
Ms	21.6	12.10	35138	20,21,22,25,26,14
Ra	59.0	3.02	23955	33,34,35
Jc	78.7	0.98	10369	27
Th	22.6	3.20	9723	68,73
Sv	24.8	1.95	6502	6
Ra	59.0	0.72	5711	-
Jh	5.9	5.96	4728	29,30,31,32
Sv	41.0	0.44	2425	-
Sv	24.8	0.44	1467	-
Bb	16.0	0.44	946	-
Nv	9.8	0.26	343	17
Nt	0.0	25.75	0	64,69,70,71,72
Ba	0.0	18.95	0	-
Nt	0.0	18.68	0	42
Ba	0.0	16.81	0	-
Ba	0.0	1.33	0	-
Nt	0.0	1.25	0	-
Ba	0.0	0.80	0	-
TOTAL		200.08	690937	

TABLE 8-D-13. Availability of Topdressing material by mapping delineation for reclamation in Area EQ-25.

Map Delin. (inches)	Depth (inches)	Acres	Cubic Yards	Sample Site
Sc	54.5	14.72	107857	24,25,26
Bb	17.8	34.07	81533	2,3,4,5,8, 9,11,13,14,15
Sc	54.5	7.65	56053	-
Rl	68.9	3.20	29642	7
Fa	6.2	18.59	15496	18,19,20,21,22,23
Rl	49.2	1.69	11179	1
Fa	11.8	3.85	6108	10
Sh	22.4	1.20	3614	12
Bb	9.8	2.54	3347	6
Nt	0.0	3.29	0	16,17
TOTAL		90.80	314828	

TABLE 8-D-14. Availability of topdressing material by mapping delineation for reclamation in Area II (Block C).

Map Delin.	Depth (inches)	Acres	Cubic Yards	Sample Sites
Ba	0	74	0	-
Fa	9.6	8.2	10534	5N8E,5N9E,4N6E,4N7E,4N8E,4N9E,4N10E, 3N5E,3N11E,3N12E
Nv	28.0	11.3	42727	1N6E,1N7E,1N8E,1N9E,2N5E,2N6E,2N7E, 3N6E,3N7E,3N8E,3N9E
Sc	46.0	6.3	39333	1N10E,1N11E,2N9E,2N10E,2N11E,2N12E,3 N10E
Fa	30.0	1.8	7260	2N16E
Bd	40.3	8.5	45997	1N14E,1N15E,1N16E,1N17E,1N18E,1N19E, 2N17E,2N18E
TOTAL		110.1	145851	

APPENDIX 8-E

**AVAILABILITY OF TOPDRESSING MATERIAL
BY MAPPING DELINEATION FOR EACH MAPPING UNIT.**

TABLE	Mapping	Unit
TABLE 8-E-1	Ba	Badlands
TABLE 8-E-2	Bb	Bacobi and Monierco Soils
TABLE 8-E-3	Bc	Blancot
TABLE 8-E-4	Bh	Blancot, very hard
TABLE 8-E-5	Fa	Farb and Persayo Soils
TABLE 8-E-6	Gr	Grieta
TABLE 8-E-7	Jc	Jocity-Gilco
TABLE 8-E-8	Jh	Jocity, very hard
TABLE 8-E-9	Ma	Mack
TABLE 8-E-10	Mn	Mayqueen
TABLE 8-E-11	Ms	Mayqueen-Shiprock
TABLE 8-E-12	Mv	Mayqueen-Shiprock, very hard
TABLE 8-E-13	Na	Nakai
TABLE 8-E-14	Nt	Natrargids
TABLE 8-E-15	Nv	Natrargids, overblown
TABLE 8-E-16	Ra	Razito
TABLE 8-E-17	Rh	Razito, very hard
TABLE 8-E-18	Rl	Redlands Variant
TABLE 8-E-19	Rv	Redlands Variant, very hard
TABLE 8-E-20	Sc	Shiprock
TABLE 8-E-21	Sh	Shiprock, very hard
TABLE 8-E-22	Sl	Shiprock-Blancot
TABLE 8-E-23	Sv	Shiprock Variant
TABLE 8-E-24	Sz	Stumble
TABLE 8-E-25	Ta	Trail
TABLE 8-E-26	Th	Trail, very hard .pa

TABLE 8-E-1. Availability of Topdressing material by mapping delineation for Badlands (Ba).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Ba	0.0	493.27	0	IV -
Ba	0.0	309.17	0	IV -
Ba	0.0	304.27	0	IV -
Ba	0.0	230.29	0	IV -
Ba	0.0	211.90	0	III -
Ba	0.0	156.75	0	IV -
Ba	0.0	140.59	0	III -
Ba	0.0	133.33	0	BB -
Ba	0.0	117.36	0	II -
BA	0.0	106.90	0	BB -
Ba	0.0	100.91	0	IV -
Ba	0.0	95.49	0	III -
Ba	0.0	94.36	0	BB -
Ba	0.0	92.75	0	IV -
Ba	0.0	78.96	0	BB -
Ba	0.0	76.15	0	IV -
Ba	0.0	68.59	0	IV -
Ba	0.0	68.17	0	BB -
Ba	0.0	64.32	0	IV -
Ba	0.0	62.70	0	IV -
Ba	0.0	60.85	0	IV -
Ba	0.0	42.99	0	IV -
Ba	0.0	41.26	0	I -
Ba	0.0	40.49	0	II -
Ba	0.0	36.94	0	II -
Ba	0.0	34.32	0	I -
Ba	0.0	34.25	0	IV -
Ba	0.0	33.86	0	I -
Ba	0.0	32.38	0	IV -
Ba	0.0	32.15	0	EQ-9 -
Ba	0.0	30.87	0	IV -
Ba	0.0	29.14	0	II -
Ba	0.0	27.21	0	IV -
Ba	0.0	23.66	0	IV -
Ba	0.0	23.41	0	BB -
Ba	0.0	23.48	0	IV -
Ba	0.0	22.72	0	II -

TABLE 8-E-1 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Ba	0.0	21.57	0	BB -
Ba	0.0	21.35	0	II -
Ba	0.0	19.51	0	I -
Ba	0.0	18.95	0	E-15 -
Ba	0.0	18.14	0	I -
Ba	0.0	18.11	0	III -
Ba	0.0	17.97	0	III -
Ba	0.0	17.50	0	I -
Ba	0.0	17.37	0	BB -
Ba	0.0	17.24	0	IV -
Ba	0.0	16.81	0	E-15 -
Ba	0.0	15.92	0	IV -
Ba	0.0	15.72	0	IV -
Ba	0.0	15.27	0	II -
Ba	0.0	14.89	0	III -
Ba	0.0	14.70	0	II -
Ba	0.0	12.68	0	I -
Ba	0.0	12.45	0	IV
Ba	0.0	11.63	0	EQ-5/6 -
Ba	0.0	11.02	0	II -
Ba	0.0	9.99	0	I -
Ba	0.0	9.12	0	I -
Ba	0.0	8.85	0	BB -
Ba	0.0	7.98	0	BB -
Ba	0.0	7.65	0	E-13 -
Ba	0.0	7.63	0	I -
Ba	0.0	7.34	0	IV -
Ba	0.0	7.34	0	II -
Ba	0.0	7.16	0	III -
Ba	0.0	7.12	0	BB -
Ba	0.0	6.83	0	IV -
Ba	0.0	6.67	0	IV -
Ba	0.0	6.56	0	IV -
Ba	0.0	6.41	0	EQ-10 -
Ba	0.0	5.61	0	BB -
Ba	0.0	5.42	0	II -
Ba	0.0	5.24	0	IV -
Ba	0.0	5.18	0	BB -

TABLE 8-E-1 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Ba	0.0	5.16	0	IV -
Ba	0.0	4.48	0	I -
Ba	0.0	4.18	0	IV -
Ba	0.0	4.02	0	I -
Ba	0.0	4.00	0	III -
Ba	0.0	3.98	0	II -
Ba	0.0	3.92	0	III -
Ba	0.0	3.83	0	EQ-10 -
Ba	0.0	3.60	0	IV -
Ba	0.0	3.58	0	II -
Ba	0.0	3.38	0	EQ-5/6 -
Ba	0.0	3.20	0	EQ-11/12 -
Ba	0.0	2.98	0	EQ-9 -
Ba	0.0	2.98	0	I -
Ba	0.0	2.94	0	EQ-11/12 -
Ba	0.0	2.76	0	EQ-9 -
Ba	0.0	2.76	0	IV -
Ba	0.0	2.73	0	IV -
Ba	0.0	2.72	0	II -
Ba	0.0	2.54	0	II -
Ba	0.0	2.51	0	II -
Ba	0.0	2.49	0	III -
Ba	0.0	2.49	0	IV -
Ba	0.0	2.47	0	IV -
Ba	0.0	2.31	0	E-13 -
Ba	0.0	2.31	0	E-13 -
Ba	0.0	2.22	0	IV -
Ba	0.0	2.04	0	IV -
Ba	0.0	1.96	0	IV -
Ba	0.0	1.87	0	IV -
Ba	0.0	1.86	0	EQ-9 -
Ba	0.0	1.78	0	IV -
Ba	0.0	1.69	0	III -
Ba	0.0	1.69	0	E-13 -
Ba	0.0	1.62	0	BB -
Ba	0.0	1.60	0	IV -
Ba	0.0	1.42	0	IV -
Ba	0.0	1.42	0	IV -

TABLE 8-E-1 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Ba	0.0	1.33	0	E-15 -
Ba	0.0	1.33	0	EQ-11/12 -
Ba	0.0	1.20	0	II -
Ba	0.0	1.16	0	E-13 -
Ba	0.0	1.08	0	I -
Ba	0.0	0.98	0	EQ-9 -
Ba	0.0	0.98	0	IV
Ba	0.0	0.98	0	IV -
Ba	0.0	0.93	0	IV -
Ba	0.0	0.89	0	E-13 -
Ba	0.0	0.86	0	I -
Ba	0.0	0.85	0	EQ-9 -
Ba	0.0	0.80	0	E-15 -
Ba	0.0	0.80	0	III -
Ba	0.0	0.71	0	IV -
Ba	0.0	0.71	0	EQ-9 -
Ba	0.0	0.71	0	IV -
Ba	0.0	0.69	0	II -
Ba	0.0	0.65	0	III -
Ba	0.0	0.62	0	EQ-9 -
Ba	0.0	0.62	0	E-13 -
Ba	0.0	0.53	0	EQ-11/12 -
Ba	0.0	0.53	0	IV -
Ba	0.0	0.53	0	IV -
Ba	0.0	0.53	0	IV -
Ba	0.0	0.49	0	III -
Ba	0.0	0.46	0	I -
Ba	0.0	0.46	0	II -
Ba	0.0	0.45	0	E-13 -
Ba	0.0	0.44	0	EQ-11/12 -
Ba	0.0	0.44	0	EQ-11/12 -
Ba	0.0	0.41	0	II -
Ba	0.0	0.40	0	III -
Ba	0.0	0.36	0	IV -
Ba	0.0	0.36	0	IV -
Ba	0.0	0.33	0	IV -
Ba	0.0	0.29	0	BB -

TABLE 8-E-1 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area	Sample Site
Ba	0.0	0.27	0	III	-
Ba	0.0	0.18	0	IV	-
Ba	0.0	0.05	0	BB	-
Ba	0.0	74.0	0	II Block C	-
TOTAL		4238.99	0		

TABLE 8-E-2. Availability of Topdressing material by mapping delineation for Bacobi and Monierco Soils (Bb).

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Bb	16.0	238.03	512029	III 383,384,385,386,387,393,394,395,396,397,398,400,401,413,414,415,418,419,420,422,422,423,424,425,426,427,428,429,446,447,448,449,450,451,452,453,454,457,33,24,25,26,27,28,29,30,31,32,34,35,37,38
Bb	20.0	127.87	343828	IV 7,9,10,11,12,13,14,16,17,18,19,20,21,23,26,28,29,30,31,33,37,38,39,40,41,42,43,44,45,52,53,60,61,62,69,70,71,72,73,76,77,78,87
Bb	14.0	76.04	143124	IV 83,84,91,94,95,98,99,105,106,107,108,111,113,115,116,117,125,126,127,128,130,131,133,134,135,139,140,142,148,150,165,166,167,170,172,173,183
Bb	13.5	48.90	88754	IV 311,317,318,319,337,338,339,352,399,400,371,373,388,389,390,403
Bb	17.8	34.07	81533	EQ-25 2,3,4,5,8,9,11,13,14,15
Bb	11.8	44.70	70914	I 152,153,154,155,156,160,161,162,163,164,165,166,167,168,169,170,171
Bb	16.0	28.52	61350	IV 186,187,188,190,192,198,200,201,202,204,205,206,208,209
Bb	17.0	20.02	45757	IV 445,446,447,448,459,460,461,464
Bb	10.9	29.62	43406	IV 308,309,310,312,343,345,346,347,395,396,397,412,413,414,393

TABLE 8-E-2 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area	Sample Site
Bb	22.4	14.40	43289	BB	110,111,121,122,123,124,125,126,131,132,134,135,136
Bb	10.9	18.59	27243	IV	431,440,441,442,452,453,454,455,468,469
Bb	11.8	15.20	24114	I	-
Bb	18.8	8.63	21813	EQ-10	4,5,6,7,8,9
Bb	24.6	6.22	20572	EQ-9	3,4
Bb	13.0	10.76	18806	IV	281,299
Bb	15.0	8.25	16638	IV	57,58
Bb	16.0	7.48	16090	IV	176,179
Bb	15.1	7.83	15896	IV	321,322,330,357
Bb	10.4	10.41	14555	IV	476,481,482
Bb	8.5	11.56	13211	IV	496,497,498,499,500,501,507
Bb	15.7	5.78	12200	IV	616,617,638
Bb	9.6	7.74	9990	EQ-5/6	10,11,12,13,14,15
Bb	23.8	2.80	8959	BB	84,86
Bb	6.8	7.38	6747	IV	544,545,546
Bb	14.0	3.04	5722	IV	-
Bb	25.0	1.44	4840	III	149
Bb	13.1	2.58	4544	EQ-9	-
Bb	5.3	5.96	4247	IV	559,560
Bb	7.4	4.04	4019	EQ-5/6	5,6,7,8
Bb	14.4	1.91	3698	EQ-9	10,16
Bb	18.8	1.42	3589	EQ-10	-
Bb	9.8	2.54	3347	EQ-25	6
Bb	11.8	1.15	1824	EQ-9	13
Bb	16.0	0.44	946	E-15	-
Bb	3.9	0.71	376	BB	17
Bb	9.8	0.10	132	IV	246
Bb	40.3	8.50	45997	II BKC	1N14E,1N15E,1N16E,1N17E,1N18E,1N19E,2N17E,2N18E
TOTAL		824.63	1744099		

TABLE 8-E-3. Availability of Topdressing material by mapping delineation for Blancot (Bc).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Bc	68.0	35.78	327109	III 304,338,351,11
Bc	100.0	9.73	130814	III 113,114,155,156,157
Bc	100.0	8.02	107824	III 104,105
Bc	58.0	9.75	76028	III 119,144,146,147
Bc	30.0	5.63	22708	III 152,153
TOTAL		68.91	664484	

TABLE 8-E-4. Availability of Topdressing material by mapping delineation for Blancot, very hard (Bh).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Bh	35.0	39.00	183517	III 266,267,272,273,274,275,
Bh	12.0	25.13	40543	III 283,284,285,286,287,288
Bh	37.0	5.48	27260	III 255,259,260
Bh	31.0	4.60	19172	III 47,48,49
Bh	15.0	8.33	16799	III 276,277,313
Bh	21.0	3.75	10588	III 257
Bh	12.0	4.59	7405	III 258,265
Bh	18.0	0.99	2396	III 254
TOTAL		91.87	307679	

TABLE 8-E-8. Availability of Topdressing material by mapping delineation for Farb and Persayo Soils (Fa).

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Fa	13.6	25.60	46750	BB 85, 90, 91, 92, 93, 94, 95 96, 133, 137, 138, 139, 140 141, 142, 143
Fa	13.3	19.60	34968	BB 43, 43A, 44, 44A
Fa	2.8	62.20	23415	IV 557, 558, 567, 568, 569
Fa	4.0	34.72	18672	IV 119, 120, 121, 122, 123, 124, 132, 136, 138, 144, 146, 147, 151
Fa	6.2	18.59	15496	EQ-25 18, 19, 20, 21, 22, 23
Fa	17.2	4.54	10498	IV 477, 478, 479, 480
Fa	3.9	18.41	9653	IV 307, 344
Fa	4.0	17.43	9373	IV 15, 32, 34, 35, 36
Fa	4.0	17.39	9352	IV -
Fa	4.3	14.67	8481	IV 508, 509, 523, 525, 526
Fa	4.0	15.05	8094	IV 92, 118, 129, 174, 175
Fa	8.0	7.46	8024	I 150, 151
Fa	4.0	13.97	7513	IV -
Fa	11.8	3.85	6108	EQ-25 10
Fa	6.9	6.13	5687	EQ-9 5, 14
Fa	4.0	10.04	5399	IV -
Fa	4.0	9.70	5216	IV -
Fa	4.0	8.54	4593	IV 50, 55
Fa	4.0	8.49	4566	IV -
Fa	3.9	7.65	4011	EQ-9 -
Fa	3.9	4.36	3458	IV 535
Fa	11.8	2.05	3252	IV 349
Fa	4.0	5.91	3178	IV 181, 185
Fa	3.9	5.87	3078	IV 462
Fa	4.0	5.10	2743	IV-
Fa	4.0	4.71	2533	IV 193
Fa	3.9	4.45	2333	IV 394
Fa	5.9	2.76	2189	IV 483
Fa	4.0	4.07	2189	IV 153, 159
Fa	4.0	3.56	1914	IV -
Fa	4.0	3.50	1882	IV -
Fa	4.0	3.44	1850	IV -
Fa	5.9	1.96	1555	EQ-11/12 4, 5
Fa	13.4	0.80	1440	BB 70, 70A, 73

TABLE 8-E-5 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area	Sample Site
Fa	4.0	2.47	1328	IV	-
Fa	9.8	0.89	1173	EQ-11/12	7
Fa	3.9	2.22	1164	IV	-
Fa	4.0	1.89	1016	IV	207
Fa	4.0	1.89	1016	IV	-
Fa	3.9	1.78	933	EQ-9	-
Fa	4.0	1.61	866	IV	-
Fa	4.0	0.92	495	IV	-
Fa	4.0	0.86	462	IV	-
Fa	3.9	0.62	325	EQ-11/12	-
Fa	3.9	0.62	325	EQ-11/12	-
Fa	4.0	0.28	151	IV	-
Fa	3.9	0.27	142	EQ-11/12	-
Fa	0.0	7.29	0	IV	-
Fa	0.0	6.94	0	IV	470
Fa	0.0	6.14	0	IV	-
Fa	0.0	4.89	0	IV	-
Fa	0.0	1.60	0	BB	-
Fa	0.0	1.20	0	BB	-
Fa	0.0	0.62	0	BB	-
Fa	0.0	0.36	0	IV	-
Fa	9.6	8.20	10534	II Blk C	5N8E,5N9E,4N6E,4N7E,4N8E,4N9E,4N10E,3N5E,3N11E,3N12E
Fa	30.0	1.80	7260	II Blk C	2N16E
TOTAL		431.93	306653		

TABLE 8-E-6. Availability of Topdressing material by mapping delineation for Grieta (Gr).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Gr	16.2	24.02	52316	IV 320,334,335,336,353,356,365,382,384
Gr	34.4	3.20	14800	EQ-9 6
Gr	16.5	5.96	13221	IV 272
Gr	32.6	0.98	4295	EQ-5/6 9
Gr	15.7	1.69	3567	IV 265
TOTAL		35.85	88199	

TABLE 8-E-7. Availability of Topdressing material by mapping delineation for Jocity - Gilco (Jc).

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Jc	70.0	134.33	1264195	IV 218,220,232,233,234,236,237,239,240,244,245
Jc	120.0	30.19	487065	I 85,92,93,94,138,139,140,141
Jc	61.8	57.99	481820	EQ-9 28,30,31,32,37,38,39,46,47,48,42,43,44,101,100,99,68,69
Jc	80.0	24.74	266092	III 106,126,136,73,75
Jc	65.0	29.88	261118	IV 212,214,215,216
Jc	84.4	19.63	222744	EQ-9 56,57,58,59,62,67,54,55
Jc	80.0	15.82	170153	II 25,26,27,28,29
Jc	60.0	20.37	164318	III 2,4
Jc	72.2	5.78	56106	EQ-11/12 15,16,17
Jc	78.7	3.65	38620	E-15 28
Jc	45.0	4.22	25531	III 101,142
Jc	60.0	2.09	16859	III -
Jc	39.0	3.16	16569	I 105
Jc	32.8	2.58	11377	EQ-11/12 12,13,14
Jc	78.7	1.07	11327	BB -
Jc	87.6	0.89	10482	EQ-11/12 1
Jc	78.7	0.98	10369	E-15 27
Jc	45.0	1.40	8470	III -
Jc	78.7	0.20	2116	BB -
TOTAL		358.97	3525331	

TABLE 8-E-8. Availability of Topdressing material by mapping delineation for Society, very hard (Jh).

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Jh	36.0	16.19	78360	III -
Jh	17.7	14.23	33863	IV 702,488
Jh	11.8	16.37	259	EQ-11/12 18,19
Jh	12.0	15.72	25362	III 229,230,231,232,233,234,236,237
Jh	11.1	8.36	12476	IV 711,712,713
Jh	5.9	5.96	4728	EQ-15- 29,30,31,32
Jh	6.9	3.98	3692	EQ-11/12 9,10
Jh	0.0	31.57	0	IV 719,720,725,726,727,728,743,749,751,754,769,770
Jh	0.0	57.50	0	EQ-9 60,61,63,64,65,66,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98
Jh	0.0	13.85	0	EQ-9 22,23,24
TOTAL		233.73	184450	

TABLE 8-E-9. Availability of Topdressing material by mapping delineation for Mack (Ma).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area	Sample Site
Ma	74.0	144.04	1433038	III	289,290,291,293,294,296, 299,301,302,303,326,327, 328,329,333,335,336,337, 342,343,344,346,347,348, 349,350,44,46,22,10
Ma	80.0	12.80	137671	IV	46,51,54,63,68
Ma	14.1	17.70	33553	IV	354,355,366,367,368,383, 425
Ma	78.0	0.55	5768	IV	-
TOTAL		175.09	1610030		

TABLE 8-E-10. Availability of Topdressing material by mapping delineation for Mayqueen (Mn).

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
My	100.0	5.83	78381	I 13,14
My	55.0	9.29	68694	I 33,34,39
My	76.0	5.40	55176	II 57,58
My	49.0	8.25	54349	I 11,26,27,28,45,46
My	70.2	5.01	47284	EQ-9 2,7,11
My	68.0	4.09	37392	I 35,36
My	80.0	3.14	33772	I 43
My	87.0	2.00	23393	I 24
My	27.9	5.12	19205	IV 372,374
My	21.6	1.60	4646	IV 386
TOTAL		49.73	422294	

TABLE 8-E-11. Availability of Topdressing material by mapping delineation for Mayqueen - Shiprock (Ms).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Ms	100.0	30.91	415568	III 134,135,71,72,77,78,79
Ms	62.5	29.71	249647	E-15 1,2,3,4,5,7, 8,9,10,11,12,13, 14,15,16,18,19,23
Ms	69.3	25.80	240483	BB 71,72,74,75,76,77,78,79, 80,81,82,87,88,89,97,98, 107,108,109,120
Ms	80.0	12.45	133907	IV 47,64
Ms	75.0	11.36	114547	I 7,142,143
Ms	46.0	14.36	88809	I 9,65,66,67,72
Ms	46.7	11.83	74275	EQ-9 1,8,9,17
Ms	72.0	7.40	71632	IV 56,59
Ms	57.6	8.09	62649	IV 449,450,451,467
Ms	42.0	10.64	60081	III 127,130,131,132
Ms	73.2	5.80	57041	BB 46,50,51,52,53,56
Ms	52.0	7.61	53202	I 47,48,74
Ms	52.6	7.21	50988	E-13 13,14,15,17
Ms	60.0	6.05	48803	III 150,151
Ms	60.0	5.91	47674	I 70,71
Ms	75.0	4.30	43358	I -
Ms	73.8	4.17	41375	EQ-9 25,26
Ms	70.0	4.33	40750	III -
Ms	56.0	5.28	39753	IV 191,196,197
Ms	21.6	12.10	35138	E-15 20,21,22,25,26,14
Ms	55.0	4.19	30983	II 14,15,16
Ms	80.0	2.60	27964	I 73
Ms	43.0	2.89	16707	III -
Ms	60.0	2.03	16375	I -
Ms	59.0	1.93	15309	I 76
Ms	47.2	2.40	15230	IV 251
Ms	43.0	2.37	13701	III 187
Ms	100.0	1.00	13444	II 23
Ms	36.0	2.72	13165	I 52
Ms	41.3	2.13	11827	EQ-10 1,2,3,10
Ms	41.3	2.05	11383	EQ-10 -
Ms	51.2	1.51	10394	IV 604,604
Ms	48.0	1.42	9164	III 204,205,54

TABLE 3-E-11 cont:

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Ms	60.0	0.84	6776	III -
Ms	43.0	0.54	3122	III -
Ms	22.0	0.53	1568	I 79
TOTAL		256.46	2186790	

TABLE 8-E-12. Availability of Topdressing material by mapping delineation for Mayqueen-Shiprock, very hard (Mv).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Mv	30.0	15.13	61024	III 57,58,59,60,195,196
Mv	36.0	11.25	54450	I 54,61,62
Mv	39.0	5.98	31355	I 56,57,59
TOTAL		32.36	146829	

TABLE 8-E-13. Availability of Topdressing material by mapping delineation for Nakai (Na).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Na	13.8	13.12	24342	IV 49,286,290
Na	17.7	3.56	8472	IV 471
Na	10.8	5.25	7623	IV 273,274
Na	21.6	2.40	6970	IV 279
Na	13.8	3.02	5603	IV 262,284
TOTAL		27.35	53009	

TABLE 8-E-14. Availability of Topdressing material by mapping delineation for Natrargids (Nt).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Nt	5.9	4.70	3732	BB 6,11,12
Nt	3.7	3.74	1881	BB 9,10,21,22,23,24
Nt	2.4	3.20	1015	BB 18,26
Nt	0.0	352.52	0	III 268,269,270,278,279,280,305,306,307,308,309,310,314,315,316,317,318,319,320,321,322,323,324,354,355,356,357,358,359,360,361,362,363,364,365,13,39,40,41,382,391,392,421,430,431,462,464,465,466,467,468,469,470
Nt	0.0	305.56	0	III 61,62,183,184,185,186,188,189,190,191,192,193,200,201,211,212,213,214,42,43,479,480,481,482,483,484,485,486,487,488,489,490,491
Nt	0.0	286.16	0	IV 487,491,490,489,696,697,699,670,671,683,684,685,686,687,688,689,690,691,692,693,694,695,675,676,677,678,679,680,681,682,644,645,646,647,649,650,651,654,660,661,662,627,630,631,641,642,663,667,669,670,622,623,626,510,511,512,513,514,515,516,517,518,519,520,521,522,527,528,529,530,531,532,536,537,538,539,540,542,543,547,553,554,555,556,565,572,573,574,575,576,577,578

TABLE 8-E-14 (cont)

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Nt	0.0	190.86	0	IV 295,296,254,255,256,257, 258,259,268,269,270,271, 277,278,302,303,304,315, 316,340,298,323,327,328, 329,331,332,333,358,359, 362,363,378,379,380,381, 406,407,408,409,410,411, 412,22,29,80,85,86,89, 96,97,177,178,180
Nt	0.0	179.13	0	IV 756,764,765,766,767,768, 744,745,746,747,748,753, 755,758,759,760,225
Nt	0.0	138.50	0	IV 587,588,742,741,740,739, 738,736,735,734,733,732
Nt	0.0	119.36	0	IV 230,231
Nt	0.0	93.71	0	III 1,3,458,459
Nt	0.0	92.23	0	I 111,112,113,114,115,117, 118,118,120,121,122,123, 124,125,126,127
Nt	0.0	82.46	0	IV -
Nt	0.0	81.22	0	III -
Nt	0.0	75.76	0	IV 589,621,717,721,722
Nt	0.0	74.05	0	IV 222,223,224,241
Nt	0.0	69.25	0	I 15,16,17,18,20
Nt	0.0	57.31	0	III 65,66,165,166,167,168, 170,171,172,180,224,225, 226
Nt	0.0	54.66	0	III 63,208,209,210,216,217, 218,219,220
Nt	0.0	51.59	0	IV 708,709,710
Nt	0.0	43.87	0	III 80,92,93,94,95,96,98,99, 100,118,120,121,143,145, 148
Nt	0.0	38.43	0	IV 235,238
Nt	0.0	35.90	0	II -
Nt	0.0	33.00	0	III 241,242,243,244,245,248, 249,250,251,252,253
Nt	0.0	32.20	0	II 42,43,44,45,46,50,51,52

TABLE 8-E-14 (cont)

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Nt	0.0	31.80	0	BB 144,145,146,147,148
Nt	0.0	30.96	0	IV -
Nt	0.0	30.42	0	IV -
Nt	0.0	29.76	0	IV -
Nt	0.0	27.71	0	III 102,103,122,123,124,141
Nt	0.0	26.33	0	IV -
Nt	0.0	25.87	0	IV 219
Nt	0.0	25.75	0	E-15 64,69,70,71,72
Nt	0.0	25.53	0	IV 729,730,731,737
Nt	0.0	24.08	0	III 108,111,112,128,129
Nt	0.0	21.71	0	II 30,31,32,33,37
Nt	0.0	20.66	0	I 144,145,146,147,149
Nt	0.0	20.28	0	IV 524
Nt	0.0	20.20	0	IV 246,247,248,249
Nt	0.0	20.10	0	IV
Nt	0.0	20.00	0	IV 242,243
Nt	0.0	19.69	0	IV -
Nt	0.0	18.68	0	E-15 42
Nt	0.0	17.17	0	IV -
Nt	0.0	16.82	0	EQ-9 40,41,45,49,50,51,
Nt	0.0	16.59	0	II 1,2,3,4
Nt	0.0	16.30	0	II -
Nt	0.0	15.50	0	III 261,262,263,264,271
Nt	0.0	15.39	0	E-13 1,2,9,10,11
Nt	0.0	15.25	0	III 474,475,476,477,478
Nt	0.0	14.32	0	II 8
Nt	0.0	14.08	0	IV -
Nt	0.0	13.89	0	I 5,89,130,131,132
Nt	0.0	13.49	0	IV -
Nt	0.0	13.49	0	IV -
Nt	0.0	12.81	0	III -
Nt	0.0	12.80	0	I 148
Nt	0.0	12.75	0	III 472
Nt	0.0	12.00	0	IV 570,571
Nt	0.0	11.76	0	IV 177,178,180
Nt	0.0	11.21	0	E-13 16,3,4
Nt	0.0	11.05	0	IV -
Nt	0.0	10.90	0	I -

TABLE 8-E-14 (cont)

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Nt	0.0	10.85	0	IV 718
Nt	0.0	10.02	0	IV -
Nt	0.0	10.00	0	BB 32,33,34,35,36,37
Nt	0.0	9.25	0	E-13 12,18,6,7
Nt	0.0	9.18	0	IV -
Nt	0.0	9.07	0	IV -
Nt	0.0	9.07	0	BB -
Nt	0.0	8.65	0	IV -
Nt	0.0	8.64	0	II NB-5,6
Nt	0.0	8.45	0	IV 475
Nt	0.0	8.20	0	BB -
Nt	0.0	8.10	0	IV -
Nt	0.0	7.83	0	IV -
Nt	0.0	7.27	0	II -
Nt	0.0	7.11	0	III -
Nt	0.0	6.94	0	IV -
Nt	0.0	6.94	0	IV 152
Nt	0.0	6.76	0	IV 428,429,430
Nt	0.0	6.76	0	IV -
Nt	0.0	6.40	0	III 235,247
Nt	0.0	6.30	0	III -
Nt	0.0	5.69	0	IV 706,707
Nt	0.0	5.57	0	III 416,417
Nt	0.0	5.47	0	EQ-5/6 1,2,4
Nt	0.0	5.43	0	IV -
Nt	0.0	5.38	0	I -
Nt	0.0	5.23	0	III 411
Nt	0.0	5.20	0	BB 128,129
Nt	0.0	5.16	0	IV -
Nt	0.0	5.15	0	I 10,69
Nt	0.0	5.02	0	I 29,30,31,32
Nt	0.0	4.89	0	EQ-10 -
Nt	0.0	4.82	0	IV -
Nt	0.0	4.71	0	EQ-10 -
Nt	0.0	4.63	0	IV 580,581,582
Nt	0.0	4.54	0	IV -
Nt	0.0	4.53	0	IV 154,161,164
Nt	0.0	4.21	0	I 64

TABLE 8-E-14 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Nt	0.0	4.18	0	IV 266
Nt	0.0	3.80	0	BB -
Nt	0.0	3.70	0	I -
Nt	0.0	3.70	0	BB 103
Nt	0.0	3.65	0	I 40
Nt	0.0	3.46	0	I 58
Nt	0.0	3.46	0	IV -
Nt	0.0	3.31	0	I 55
Nt	0.0	3.29	0	EQ-25 16,17
Nt	0.0	3.16	0	I 109
Nt	0.0	3.10	0	II -
Nt	0.0	2.83	0	III -
Nt	0.0	2.76	0	IV -
Nt	0.0	2.60	0	II 24
Nt	0.0	2.50	0	BB -
Nt	0.0	2.50	0	BB -
Nt	0.0	2.45	0	I -
Nt	0.0	2.31	0	IV -
Nt	0.0	2.22	0	IV -
Nt	0.0	2.08	0	III 455
Nt	0.0	2.05	0	EQ-9 -
Nt	0.0	2.02	0	III -
Nt	0.0	1.97	0	IV 213
Nt	0.0	1.87	0	IV 601,602
Nt	0.0	1.78	0	III -
Nt	0.0	1.71	0	I 80
Nt	0.0	1.69	0	EQ-9 29
Nt	0.0	1.69	0	IV -
Nt	0.0	1.66	0	III -
Nt	0.0	1.53	0	II 65
Nt	0.0	1.51	0	IV -
Nt	0.0	1.42	0	EQ-11/12 2
Nt	0.0	1.36	0	II -
Nt	0.0	1.35	0	IV -
Nt	0.0	1.32	0	IV -
Nt	0.0	1.29	0	IV 27
Nt	0.0	1.25	0	E-15 -
Nt	0.0	1.18	0	II -

TABLE 8-E-14 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Nt	0.0	1.09	0	I -
Nt	0.0	1.01	0	IV -
Nt	0.0	0.98	0	I -
Nt	0.0	0.98	0	I -
Nt	0.0	0.97	0	I -
Nt	0.0	0.95	0	III -
Nt	0.0	0.87	0	III -
Nt	0.0	0.85	0	I 78
Nt	0.0	0.80	0	BB 38,39
Nt	0.0	0.74	0	II 54
Nt	0.0	0.71	0	III -
Nt	0.0	0.67	0	III -
Nt	0.0	0.62	0	EQ-5/6 -
Nt	0.0	0.62	0	IV -
Nt	0.0	0.62	0	IV -
Nt	0.0	0.53	0	IV -
Nt	0.0	0.46	0	I 2
Nt	0.0	0.46	0	III -
Nt	0.0	0.46	0	I -
Nt	0.0	0.44	0	EQ-10 -
Nt	0.0	0.36	0	EQ-7/8 -
Nt	0.0	0.36	0	BB -
Nt	0.0	0.34	0	IV -
Nt	0.0	0.18	0	III -
TOTAL		3579.67	6628	

TABLE 8-E-15. Availability of Topdressing material by mapping delineation for Natrargids, overblown (Nv).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Nv	26.8	13.20	47508	BB 99,101,102,104,112,113,115,116,118,119
Nv	5.8	58.53	45640	IV 369,370,364,385,405,426,427,413,435,414,415,424,423,422,421,420,419,432,433,434
Nv	10.0	32.19	43278	III 432,433,534,435,436,437,438,439,442,443,444,445
Nv	12.0	23.20	37429	III 51,52,53,55,202,203,206,226
Nv	9.3	26.15	32696	IV 635,636,637,639,640,652,653,655,656,657,590
Nv	22.6	9.82	29838	IV 591,592
Nv	12.0	11.83	19086	II 17,18,19,20,21,22
Nv	9.5	13.52	17268	IV 668,671,672,673,674,648
Nv	17.7	6.23	14825	IV 658,659
Nv	10.0	10.65	14318	III 163,164,175
Nv	5.9	13.22	10486	EQ-9 33,34,35,36
Nv	28.4	2070	10291	BB 63,64,83
Nv	8.0	8.61	9261	IV 228,229
Nv	8.9	7.29	8723	IV 625
Nv	6.2	9.43	7860	IV 260,276,306,341
Nv	7.1	7.21	6882	IV 600
Nv	3.4	11.48	5248	IV 492,504,505,506
Nv	15.7	2.40	5066	IV 666
Nv	5.9	5.34	4236	IV 472,474
Nv	13.0	2.30	4017	BB 47,48,49
Nv	12.6	1.96	3320	IV 714,715
Nv	3.9	5.21	2732	IV 264,282
Nv	5.9	3.29	2610	IV 360,361
Nv	5.9	3.29	2610	IV 723,724
Nv	5.9	3.29	2610	IV 613,614
Nv	19.7	0.98	2596	IV 716
Nv	5.9	3.11	2467	IV 750,752
Nv	15.7	1.16	2449	EQ-9 27
Nv	4.9	3.29	2167	IV 350,351
Nv	10.0	1.49	2003	III -

TABLE 8-E-15 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area	Sample Site
Nv	5.9	2.49	1975	IV	-
Nv	5.9	2.49	1975	IV	-
Nv	14.6	1.00	1959	BB	130
Nv	3.9	3.11	1631	IV	267
Nv	16.1	0.71	1537	IV	-
Nv	3.9	2.85	1494	IV	463
Nv	12.0	0.56	903	I	50
Nv	3.9	1.33	697	IV	285
Nv	12.0	0.43	694	I	-
Nv	11.0	0.38	562	I	81
Nv	8.9	0.44	526	IV	-
Nv	9.8	0.26	343	E-15	17
Nv	28.0	11.3	42727	II Blk C	1N6E,1N7E,1N8E,1N9E,2N5E,2N6E,2N7E, 3N6E,3N7E,3N8E,3N9E
TOTAL		329.72	456543		

TABLE 8-E-16. Availability of Topdressing material by mapping delineation for Razito (Ra).

Map Del.	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Ra	48.0	28.50	183920	III 125,137,138,139,140,161
Ra	100.0	11.59	155821	I 86,87,97,137
Ra	70.0	16.18	152272	III 162,176,177,76,115
Ra	100.0	10.73	144259	I 4,90,108,129
Ra	70.0	14.05	132226	II 5,38
Ra	70.0	12.00	112933	I 88,101,102,134
Ra	80.0	7.31	78623	II 59,60,61
Ra	65.0	8.72	76203	IV 493,494,495,502,503
Ra	93.5	5.50	69138	EQ-9 18,19,20,21
Ra	59.7	8.54	68545	IV 598,599,610
Ra	85.0	5.77	65938	II 68,69
Ra	122.8	3.40	56149	BB 105,114,117
Ra	80.0	5.00	53778	II NB-1,2,3
Ra	56.1	6.49	48950	IV 583,584,586,606
Ra	85.0	4.11	46968	I 60,82
Ra	90.0	3.63	43923	III 222
Ra	47.0	6.48	40946	IV 189,199,203
Ra	59.0	4.84	38392	I 19
Ra	85.0	3.19	36455	II 63,64
Ra	39.4	6.23	33001	IV 593,594,615
Ra	75.5	3.20	32482	EQ-7/8 1,2
Ra	24.0	9.23	29782	III 67,68,69,70,179
Ra	86.6	2.50	29107	EQ-9 52,53
Ra	59.3	3.38	26947	EQ-9 -
Ra	98.4	2.00	26467	BB 45
Ra	80.0	2.37	25491	I 49,75
Ra	66.9	2.80	25184	IV 703,704,705
Ra	59.0	3.02	23955	E-15 33,34,35
Ra	70.0	2.25	21175	II -
Ra	80.0	1.92	20651	I 51,77
Ra	56.0	2.63	19801	II 66,67
Ra	36.0	4.03	19505	I 63,68
Ra	54.0	2.25	16335	III 228
Ra	80.0	1.49	16026	II NB-4,5
Ra	26.0	4.43	15485	I 12,32
Ra	80.0	1.08	11616	III 256
Ra	80.0	0.91	9788	II -

TABLE 8-E-16 (cont)

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Ra	43.0	1.50	8672	III 227
Ra	60.0	1.03	8309	I 53
Ra	60.0	1.03	8309	I 1
Ra	59.0	1.02	8091	EQ-9 -
Ra	59.0	0.98	7774	EQ-11/12 11
Ra	57.0	0.98	7510	IV -
Ra	57.0	0.89	6820	IV -
Ra	59.3	0.80	6378	EQ-9 -
Ra	72.0	0.63	6098	III 463
Ra	57.0	0.78	5977	III 240
Ra	59.0	0.72	5711	E-15 -
Ra	100.0	0.40	5378	II 10
Ra	49.2	0.62	4101	IV 401
Ra	55.1	0.53	3926	EQ-11/12 8
Ra	60.0	0.45	3630	I -
Ra	59.0	0.27	2142	EQ-11/12 6
Ra	75.5	0.17	1726	EQ-7/8 4
Ra	78.7	0.09	952	EQ-5/6 3
TOTAL		234.64	2109741	

TABLE 8-E-17. Availability of Topdressing material by mapping delineation for Razito, very hard (Rh).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Rh	22.4	36.74	110645	IV 595,596,597,628,629,632,633,634,611,612,608,609,603,585
Rh	30.0	10.39	41906	I 128
Rh	30.0	7.12	28717	IV 156,157,210,211
Rh	27.6	7.17	26605	IV 550,551,552
Rh	28.9	5.52	21448	IV 313,314,342
Rh	33.0	3.56	15795	I 106,107
Rh	33.0	2.53	11225	III 74
Rh	12.0	6.56	10583	I 21,22
Rh	23.0	3.19	9864	III 207
Rh	28.0	1.49	5609	I 103,104
Rh	18.0	2.12	5130	IV 145
Rh	18.0	1.72	4162	IV 160
Rh	23.6	0.62	1967	EQ-11/12 3
Rh	16.0	0.64	1377	EQ-9 106,107,108,109
TOTAL		89.37	295034	

TABLE 8-E-18. Availability of Topdressing material by mapping delineation for Redlands Variant (Rl).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Rl	73.0	38.83	381095	III 300,325,330,331,332,339,340,341,5
Rl	53.0	29.37	209278	IV 66,67,74,75
Rl	83.0	17.37	193830	III 45,292,297,298
Rl	60.0	13.40	108093	III 6,7
Rl	79.0	9.84	104512	III 295
Rl	73.0	8.28	81264	III 345
Rl	75.0	5.70	57475	III 82,83,84,85,89
Rl	50.0	6.54	43963	IV 90,100,101,102
Rl	71.0	3.51	33505	II 55,56
Rl	68.9	3.20	29642	EQ-25 7
Rl	51.2	3.02	20788	IV 275
Rl	80.0	1.83	19683	I 44
Rl	51.0	2.76	18924	III 25,399
Rl	40.0	2.93	15757	IV 82
Rl	49.2	1.69	11179	EQ-25 1
Rl	30.7	2.67	11020	IV 252
Rl	53.0	1.25	8907	IV -
Rl	55.0	1.15	8504	IV 195
Rl	43.3	1.42	8266	IV 398
Rl	42.0	0.92	5195	IV 88
TOTAL		155.68	1370880	

TABLE 8-E-19. Availability of Topdressing material by mapping delineation for Redlands Variant, very hard (Rv).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Rv	27.0	20.99	76194	III 388,389,407,408
Rv	39.0	5.58	29258	III 246
Rv	13.5	10.05	18241	IV 391,392,402
Rv	14.8	4.80	9551	IV 579
Rv	30.0	2.18	8793	IV 158
Rv	9.7	6.05	7890	IV 324,325,326
Rv	10.8	4.98	7231	IV 548,549
Rv	11.8	2.58	4093	IV 348
Rv	22.0	1.15	3401	IV 155
Rv	20.5	0.98	2701	IV 404
TOTAL		59.34	167352	

TABLE 8-E-20. Availability of Topdressing material by mapping delineation for Shiprock (Sc).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Sc	67.0	66.70	600819	III 19,20,21,23,366,367,372,373,375,377,378,379,390,409,410
Sc	95.6	12.50	160577	BB 54,55,57,58,59,60,61,62,65,66,67,68,69
Sc	71.8	20.10	194028	EQ-7/8 3,5,6,7,8,9,10,11,12,13,14,18,20
Sc	54.5	14.72	107857	EQ-25 24,25,26
Sc	60.0	13.09	105593	II 39,40,41,47,48,49
Sc	55.0	13.77	101822	IV 1,2,3,109,110
Sc	70.0	10.50	98817	I 37,38
Sc	85.0	7.39	84451	II 62
Sc	70.0	8.92	83947	III 352,353,12
Sc	56.9	10.00	76539	BB 2,3,4,5,7,8,14,19,20,25
Sc	40.7	10.62	58111	I 157,158,159
Sc	54.5	7.65	56053	EQ-25 -
Sc	55.0	6.34	46881	III 460,461
Sc	77.0	4.09	42341	III 471,473
Sc	58.4	4.50	35326	BB 40,41,42
Sc	80.0	2.97	31944	II 11,12,13
Sc	50.0	4.41	29645	III 238,239
Sc	28.0	6.25	23528	IV 141,149,163,182,184
Sc	66.9	2.58	23205	IV 418
Sc	80.0	2.09	22479	I 23
Sc	75.8	2.10	21398	BB 100,106
Sc	23.6	6.14	19482	EQ-9 12
Sc	40.0	2.46	13229	I -
Sc	46.0	2.08	12864	III 97
Sc	67.0	1.33	11980	III -
Sc	50.0	1.74	11697	III -
Sc	50.4	1.69	11451	IV 287,288
Sc	50.0	1.58	10621	III -
Sc	42.0	1.61	9091	III 86,87,88
Sc	60.0	1.10	8873	II -
Sc	56.0	0.97	7303	III 107

TABLE 8-E-20 (cont)

Map Del.	Depth (inches)	Acres	Cubic Yards	Area	Sample Site
Sc	49.9	1.00	6710	BB	127
Sc	80.0	0.50	5378	II	-
Sc	75.8	0.40	4076	BB	-
Sc	50.0	0.14	941	III	-
Sc	46.0	6.3	39333	II Blk C	1N10E,1N11E,2N9E,2N10E,2N11E,2N12E,3N10E
TOTAL		260.33	2178389		

TABLE 8-E-21. Availability of Topdressing material by mapping delineation for Shiprock, very hard (Sh).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Sh	31.0	9.47	39469	IV 4, 5, 6, 25
Sh	19.5	13.43	35209	IV 289, 291, 292, 293, 294
Sh	27.6	7.65	28387	EQ-7/8 21, 22, 23, 24, 25, 26, 27
Sh	48.0	3.69	23813	III 109, 110
Sh	18.7	9.34	23482	IV 436, 437, 438, 439, 443, 444
Sh	26.0	6.24	21812	II 34, 35, 36
Sh	32.0	4.25	18284	III 81, 90, 91
Sh	36.0	3.76	18198	III 402, 403, 456
Sh	14.6	5.96	11699	IV 533, 534, 607
Sh	13.8	5.96	11058	IV 618, 619, 620
Sh	22.0	2.93	8666	I 133
Sh	34.0	1.66	7588	IV 162
Sh	26.0	2.13	7446	I 25
Sh	11.1	4.89	7298	IV 456, 457, 458
Sh	24.0	2.24	7228	III 221
Sh	13.8	3.38	6271	IV 561, 562, 563, 564
Sh	37.0	0.75	3731	I 116
Sh	22.4	1.20	3614	EQ-25 12
Sh	27.6	0.71	2635	EQ-7/8 19
Sh	26.0	0.74	2587	I -
Sh	19.7	0.44	1165	IV 261
TOTAL		90.82	289640	

TABLE 8-E-22. Availability of Topdressing material by mapping delineation for Shiprock - Blancot (S1).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
S1	75.0	15.15	152763	I 98,99,100,135,136
S1	80.0	7.92	85184	I 6,83,84
S1	100.0	2.78	37376	I 95,96
S1	48.0	3.69	23813	III 109,110
S1	22.0	1.15	3401	I 110
TOTAL		30.69	302537	

TABLE 8-E-23. Availability of Topdressing material by mapping delineation for Shiprock Variant (Sv).

Map Del. (inches)	Depth	Acres	Cubic Yards	Area Sample Site
Sv	67.0	43.73	393910	III 9,14,15,16,17,18,369, 370,371,374
Sv	29.5	7.76	30777	IV 263,283,250
Sv	41.0	4.10	22600	III 412
Sv	11.6	10.92	17030	IV 416,417
Sv	19.0	5.52	14101	IV 280,300,301
Sv	31.5	2.01	8512	IV 466
Sv	24.8	2.44	8136	E-15 -
Sv	24.8	1.95	6502	E-15 6
Sv	41.0	0.44	2425	E-15 -
TOTAL		78.87	503993	

TABLE 8-E-24. Availability of Topdressing material by mapping delineation for Stumble (Sz).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Sz	80.0	9.77	105082	IV 48,65
Sz	40.0	2.90	15596	III 158,159,160
TOTAL		12.67	120677	

TABLE 8-E-25. Availability of Topdressing material by mapping delineation for Trail (Ta).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Ta	81.2	13.79	150544	E-15 38,39,40,41,45,46, 50,51
Ta	74.0	10.94	108841	E-15 57,58,60,61,62
Ta	80.0	6.90	74213	EQ-7/8 15,16,17
Ta	65.9	2.00	17732	BB 15,16
Ta	113.2	0.36	5478	BB 27,29
Ta	25.6	0.97	3339	E-13 5
TOTAL		34.96	360147	

TABLE 8-E-26. Availability of Topdressing material by mapping delineation for Trail, very hard (Th).

Map Del. (inches)	Depth (inches)	Acres	Cubic Yards	Area Sample Site
Th	10.8	28.91	41977	E-15 43,44,47,49,48,63, 65,66,67,52,53,54, 36,37,55,56,59
Th	60.0	2.00	16144	BB 28,30
Th	22.6	3.20	9723	E-15 68,73
Th	4.4	4.80	2839	IV 757,761,762,763
Th	7.1	1.78	1699	IV 253
TOTAL		40.69	72383	

APPENDIX 8-F

SOIL SERIES DESCRIPTIONS AND LABORATORY DATA

Avalon Series

The soils in the Avalon series are classified as Typic Calciorthids, fine-loamy, mixed, mesic. These deep, well drained soils are on mesas and plateaus. The soils formed in calcareous eolian and alluvial material derived from sandstone and shale. Slope is 0 to 5 percent.

Typifying pedon: Avalon sandy loam, 1 percent slope. Location is Area III, site 453.

- A- 0 to 4 inches; yellowish brown (10 YR 5/4) sandy loam, dark yellowish brown (10 YR 4/4) moist; weak platy to weak subangular blocky structure; slightly hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bw- 4 to 16 inches; yellowish brown (10 YR 5/4) sandy loam, yellowish brown (10 YR 5/4) moist; weak medium subangular blocky structure; hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bk- 16 to 34 inches; white (10 YR 8/1) sandy clay loam; pale brown (10 YR 6/3) moist; weak medium subangular blocky; hard, sticky and slightly plastic; visible disseminated calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

- C- 34 to 47 inches; light yellowish brown (10 YR 6/4) sandy clay loam; yellowish brown (10 YR 5/4) moist; massive slightly hard to hard, sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline.
- R- 47 inches: calcareous sandstone.

The solum is 20 to 40 inches thick and has a calcic horizon. The A horizon is sandy loam, loamy sand with a hue of 7.5 YR and 10 YR. The B horizon has a hue of 5 YR to 10 YR and textures of sandy loam, loam and sandy clay loam. the C horizon is sandy loam, loam or sandy clay loam and may be gravelly. It has a hue of 5 YR to 10 YR.

The range of topdressing depth is 11 to 47 inches. The limiting factors for topdressing are bedrock, carbonates and dry consistence. The Avalon series was described at 10 sites in the survey area.

AVALON SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL															
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP						
			in			%					DSM meq/100g																
III	453	S	0-4	A	SL	SH	85	17	18	SL		8.03	0.44	2.27	1.53	0.36	2.34	3.6									
		S	4-18	Bw	SL	H	86	15	19	SL		8.22	0.49	3.41	1.34	0.24	3.84	6.9									
		U	18-34	Bk	SCL	H	49	25	28	SCL		8.17	1.30	10.40	1.90	0.71	8.10	15.2									
		S	34-47	C	SCL	SH-H	57	20	23	SCL	35	8.04	2.55	21.30	3.74	1.95	12.63	7.0	3.03	10.50	21.71						

AVALON SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL															
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP						
			in			%					DSM meq/100g																
IV	20	S	0-6	A	SL	SH	80	8	12	SL		8.09	0.38	5.95	3.18	0.71	4.28	1.7									
		S	6-14	Bw	SL	H	72	12	18	SL		8.17	0.28	0.50	1.85	0.48	0.48	4.5									
		S	14-23	Bk1	SL	H	65	15	20	SCL/SL		8.00	0.28	0.82	1.54	0.62	0.89	7.8									
		U	23-45	Bk2	SCL	H-VH	62	17	21	SCL		8.33	0.69	5.24	1.03	0.51	5.79	20.0									
EQ-56	10	S	0-5	A	SL	SH	84	7	9	LS	31	7.70	0.49	0.68	2.70	0.52	0.54	2.2									
		S	5-15	Bw	SL	H	83	7	10	LS	30	7.56	0.98	2.81	5.25	0.33	1.68	8.8									
		U	15-32	Bk	S	H	52	22	28	SCL	42	7.73	0.84	2.80	2.31	0.93	2.04	36.2									

Bacobi Series

The soils in the Bacobi series are classified as Typic Haplargids, fine-loamy, mixed mesic. These moderately deep, well drained soils are on knolls, mesas, and plateaus. The soils formed in eolian and alluvial material overlying sandstone and shale.

Typifying pedon: Bacobi fine sandy loam, 1 to 5 percent slopes. Location is Area IV, site 390.

- A- 0 to 4 inches; light brown (10 YR 5/4) loamy sand, brown (10 YR 5/3) moist; weak thin platy structure; slightly hard, nonsticky and nonplastic; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- Bt- 4 to 14 inches; brown (10 YR 5/4) sandy loam, brown (10 YR 5/4) moist; moderate medium subangular blocky structure; hard, slightly sticky and plastic; common clay bridging of sand grains; a few thin patchy clay films on faces of peds; strongly effervescent; mildly alkaline; clear smooth boundary.
- Btk1- 14 to 32 inches; mixed brown and dark yellowish brown (10 YR 7/3) sandy clay loam, dark yellowish brown (10 YR 5/4) moist; strong medium subangular blocky structure; extremely hard, sticky and plastic; common clay-bridging of sand grains; few thin patchy clay films; common fine lime masses; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary. (6 to 13 inches thick).

- Btk2- 32 to 37 inches; brown (10 YR 8/2) clay loam, dark brown (10 YR 6/4) moist; moderate medium subangular blocky structure; extremely hard, sticky and plastic; common clay-bridging of sand grains; few thin patchy clay films on faces of peds; common fine lime asses; strongly effervescent; moderately alkaline; clear smooth boundary.
- Crk- 37 to 57 inches; calcareous sandstone; mildly alkaline; abrupt smooth boundary.
- 3R- 57 to 60 inches sandstone and shale.

Thickness of the solum and depth to paralithic contact ranges from 20 to 40 inches. The A horizon is loamy sand, sandy loam or sandy clay loam and has a hue of 7.5 YR or 10 YR. The Bt horizon is sandy clay loam, sandy loam, or clay loam and ranges from 12 to 34 percent clay. It has a hue of 10 YR or 7.5 YR. The Cr and R is either shale or sandstone.

The range of topdressing depth is 4 to 36 inches. The limiting factors for topdressing are bedrock and carbonates. The Bacobi series was described at 115 sites in the survey area.

SACOBI SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DSM meq/100g									
IV	390	S	0-4	A	LS	SH	82	7	11	LS	29	7.21	0.89	0.87	5.18	1.72	0.47	1.2			
		S	4-14	Bt	SL	H	80	7	13	SL	29	7.73	0.54	2.90	1.97	0.50	2.61	2.1			
		U	14-32	Bk	SCL	EH	56	15	29	SCL	39	7.89	0.84	4.70	1.35	0.44	4.97	4.2			
		U	32-37	Bk2	CL	EH	38	26	36	CL	41	7.83	1.20	8.85	2.58	1.05	8.57	16.1			

SACOBI SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DSM meq/100g									
I	169	S	0-6	A	SL	SH	68	14	18	SL	27	7.98	0.49	0.42	3.17	0.86	0.30	4.8			
		S	6-14	Bt	SCL	H	66	14	20	SCL	33	8.14	0.30	0.42	1.58	0.37	0.43	11.2			
		U	14-23	Bk	SCL	H	47	33	20	L	41	9.00	0.47	1.31	2.30	0.55	1.10	33.8			
III	29	S	0-4	A	FSL	SH	75	12	13	SL		7.90	0.43	0.89	4.00	0.77	0.84	3.8			
		S	4-15	Bt	SL	SH	73	13	14	SL		7.84	0.42	2.22	2.92	0.48	1.70	4.3			
		S	15-30	Bk	SCL	H	59	19	22	SCL		8.16	0.99	10.00	2.47	0.42	8.32	20.2			
III	32	S	0-6	A	L-SCL	H	85	16	19	SL		7.92	0.34	1.29	2.91	0.58	0.98	3.5			
		S	6-12	Bt1	SCL	H-VH	63	14	23	SCL		7.97	0.41	2.81	1.99	0.44	2.84	4.5			
		U	12-27	Bk2	SCL	VH	66	12	20	SCL/SL		8.15	0.70	11.50	1.48	0.38	11.93	5.4			
		U	27-47	Ck	C	H	30	24	48	C	84	7.78	5.80	32.50	13.50	13.00	8.93	16.2			

BACOBI SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					SAT	LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	pH		E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			in-				%			%			DSM		meq/l		%		meq/100g		%	
III	33	S	0-5	A	FSL-LFS	S	78	8	14	SL		6.13	0.39	1.22	2.40	0.39	1.03	1.9				
		S	5-11	Bw	FSL	H	78	10	14	SL		6.20	0.39	3.14	1.17	0.22	3.77	2.3				
		U	11-28	Btk	SL	VH-EH	75	9	16	SL		6.64	1.10	9.38	3.94	0.43	6.35	5.1				
		U	28-36	Crk	C	VH	23	33	44	C	71	6.06	8.20	68.80	12.44	13.60	19.07	7.8	8.61	23.70	15.74	
		U	36-60	Cr	C	VH	20	42	38	CL/C	71	6.03	6.60	73.00	12.20	14.50	19.98	2.5	9.36	20.80	20.10	
III	34	S	0-5	A	L	H	50	24	28	SCL		7.95	0.48	1.29	2.99	0.58	0.97	3.3				
		S	5-16	Bt	CL	H	50	20	30	SCL		7.96	0.43	1.43	2.53	0.58	1.15	5.7				
		U	18-32	Btk	SCL	H	55	22	23	SCL		6.01	0.68	4.68	2.11	0.62	4.01	23.6				
III	38	S	0-4	A	LS	L	86	4	10	SL	30	6.04	0.39	1.19	3.32	0.44	0.87	1.6				
		S	4-9	Bw	SL	SH	76	9	15	SL		6.21	0.49	4.04	1.22	0.20	4.79	2.6				
		S	9-23	Btk	SL-SCL	H-VH	72	10	18	SL		6.26	0.80	5.54	0.99	0.21	7.15	3.4				
		S	23-30	Crk	SL-SCL	H-VH	72	10	18	SL		6.33	0.94	5.84	1.10	0.21	7.22	7.3				
		S	30-46	Cr			67	16	17	SL	40	6.62	1.40	12.74	1.17	0.37	14.52	6.1	2.26	10.50	16.67	
IV	309	S	0-5	A	SL	SH	84	6	10	LS	28	7.61	0.66	4.32	2.64	1.82	1.51	2.7				
		S	5-13	Bt	SCL	H	70	11	19	SL	35	7.44	0.40	1.66	1.34	0.44	1.25	6.6				
		U	13-22	Bk	SCL	H	84	19	17	SL	35	7.53	0.45	1.07	2.69	0.41	3.13	16.3				
IV	321	S	4-12	Bt	SCL	H-VH	56	17	25	SCL												
IV	441	S	0-5	A	SL	SH	80	7	13	SL	29	7.79	0.36	0.30	2.45	0.65	0.24					
		S	5-25	Bt	SL	H-VH	83	4	13	SL	30	6.26	0.49	3.99	0.74	0.31	5.51					
IV	638	S	0-6	A	LS	SH	88	2	10	LS		7.72	0.35	0.25	2.49	0.44	0.21	2.3	0.23			
		U	6-20	Bt	SL	EH	72	9	19	SL		7.77	0.32	0.98	1.68	0.55	0.91	3.9				
		U	20-28	Btk	SCL	EH	71	6	21	SCL		6.04	0.48	3.31	0.74	0.30	4.59	3.0				
		U	28-31	C	LS	VH	81	6	13	SL		6.07	0.49	4.04	0.65	0.23	6.09	6.7				
		U	31-35	2Bk	SL	VH	70	11	19	SL		6.10	0.62	5.11	0.61	0.24	7.64	11.6				

BACOBI SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL										
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			-ft-				-%			-%			DSM	-meq ^l -			-%		-meq/100g-		-%	
EQ-5/6	6	U	8-22	Bk	SCL	H	49	30	21	L LS												37.9
EQ-9	3	S	0-6	A	LS	SH	87	3	10	LS	33	7.52	0.55	0.78	3.56	0.62	0.54	1.6				
		S	6-16	Bt	SL	SH	85	3	12	LS	33	7.65	0.43	1.08	2.30	0.44	0.92	6.0				
		M	16-26	Btk	SL	H	89	14	17	SL	34	7.57	0.47	1.13	2.03	0.67	0.67	26.8				
EQ-9	4	S	16-33	Bt2	SL	SHH	85	3	12	LS												
EQ-25	4	S	6-16	Btk	SL	H-VH	76	9	14	SL												4.8

Benally Series

The soils in the Benally series are classified as Typic Natrargids, fine-loamy, mixed mesic. These sodium-affected deep well drained, soils are on small depressions and swales of mesas and terraces. The soil formed in alluvial material derived from sandstone and shale.

Typifying pedon: Benally sandy clay loam, 0 to 5 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1987.

- A- 0 to 1 inch; brown (7.5 YR 5/4) sandy clay loam, brown (7.5 YR 4/4) moist; strong coarse platy structure and moderate fine granular; soft, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- E/Btn- 1 to 4 inches; light brown (7.5 YR 6/4) clay loam, brown (7.5 YR 5/4) moist; strong medium prismatic structure; very hard, sticky and plastic; upper 2 inches of the prisms have uncoated sand grains; few thin clay films and clay bridging sand grains on the faces of prisms; strongly effervescent; very strongly alkaline; abrupt smooth boundary.
- Btkn- 4 to 11 inches; light brown (7.5 YR 6/4) clay loam, brown (7.5 YR 5/4) moist; moderate medium prismatic structure parting to moderate coarse blocks; hard, sticky and plastic; few thin clay films on faces of peds and in pores; 5 percent pebbles; strongly effervescent; secondary carbonates segregated in few, fine irregularly shaped soft masses; very

strongly alkaline clear smooth boundary.

Byn- 11 to 19 inches; light yellowish brown (10 YR 6/4) clay loam, yellowish brown (10 YR 5/4) moist; moderate coarse and medium subangular blocky structure; friable, sticky and plastic; 5 percent pebbles; secondary very fine sized gypsum crystals segregated in common fine irregularly shaped soft masses and filaments; strongly effervescent; very strongly alkaline; clear wavy boundary.

By- 19 to 31 inches; very pale brown (10 YR 7/3) clay loam, light yellowish brown (10 YR 6/4) moist; weak coarse and moderate medium subangular blocky structure; slightly hard, slightly sticky and slightly plastic; 5 percent pebbles secondary very fine sand sized gypsum crystals segregated in common fine irregularly shaped soft masses and filaments, primary coarse sand sized gypsum crystals in common fine masses; slightly effervescent; strongly alkaline; clear wavy boundary.

2BCy- 31 to 52 inches; very pale brown (10 YR 7/3) channery sandy clay loam, yellowish brown (10 YR 5/4) moist massive; platy rock structure; slightly hard, slightly sticky and slightly plastic; few fine roots; 15 percent soft sandstone and shale fragments; 25 percent channers and 5 percent hard sandstone pebbles; secondary very fine sand sized gypsum crystals segregated in few fine filaments and on the undersides of rock fragments, primary coarse sand sized gypsum crystals in few fine masses; slightly effervescent; moderately alkaline; clear

wavy boundary.

2Cr- 52 to 50 inches; soft sandstone bedrock.

The solum is 20 to 40 inches thick. The exchangeable sodium is 25 to 75 percent and the gypsum content ranges from 5 to 15 percent. The A horizon is loamy sand to clay. It has a hue of 7.5 YR to 10 YR. The Bt horizon is sandy clay loam or clay loam and has a hue of 7.5 YR to 10 YR. The Bc or C horizon is clay loam or sandy clay loam and has a hue of 7.5 YR to 10 YR.

The range of topdressing depth is 0 to 14 inches. The limiting factors are dry consistence and SA. The Benally series was described at 65 sites in the survey area. Samples from a typifying pedon were not collected.

BENALLY SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				---	---	---	---	---	DSM	---meq/---			---	---meq/100g---			---	
SAMPLE NOT TAKEN																					

BENALLY SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				---	---	---	---	---	DSM	---meq/---			---	---meq/100g---			---	
IV	891	U	0-5	A	S	VH	80	8	14	SL	36	8.37	2.30	21.11	1.88	0.48	19.52				
		U	5-18	Bmy	SCL	VH	83	9	28	SCL	83	8.31	12.00	124.50	18.00	4.31	37.28				
		U	18-26	By	S	VH	78	4	18	SL	51	8.61	14.00	178.40	17.80	5.25	51.97				
		U	26-49	Ck	S	VH	83	6	11	LS	48	8.42	10.50	113.26	18.75	8.13	32.11				

Blancot Series

The soils in the Blancot series are classified as Typic Haplargids, fine-loamy, mixed mesic. These deep well drained soils are in upland valleys and on alluvial fans. The soils formed in alluvium derived from sandstone and shale.

Typifying pedon: Blancot sandy loam, 0 to 5 percent slopes. Location is Area III, site 104.

- A- 0 to 6 inches; pale brown (10 YR 6/3) sandy loam, brown (10 YR 5/3) moist; weak, a fine granular structure; soft; slightly sticky and slightly plastic; mildly alkaline; clear smooth boundary.
- Bt1- 6 to 22 inches; pale brown (10 YR 6/3) sandy loam, brown (10 YR 5/3) moist/ moderate medium subangular blocky structure; hard, sticky and plastic; thin clay films; moderately alkaline; clear smooth boundary.
- Bt2- 22 to 39 inches; brown (10 YR 5/3) sandy clay loam, brown (10 YR 4/3) moist; strong medium prismatic structure; very hard, very sticky and plastic; thin clay films; moderately alkaline; clear smooth boundary.
- C- 39 to 87 inches; light yellowish brown (2.5 Y 6/4) sandy loam, olive brown (2.5 Y 5/4) moist; massive; very hard, slightly and plastic; slightly effervescent with disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

The control section averages 18 to 35 percent clay. The soil is mildly to strongly alkaline. The A horizon has a hue of 10 YR or 2.5 Y. It is heavy sandy loam, loam, sandy clay loam or clay loam. The C horizon has a hue of 10 YR or 2.5 Y. It is sandy loam, loam, sandy clay loam or clay loam.

The range of topdressing depth is 10 to 91 inches. The limiting factors for topdressing are dry consistence and bedrock. The Blancot series was described at 51 sites in the survey area.

BLANCOT SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DS/M meq/100g % meq/100g %									
III	104	S	0-6	A	SCL	S	76	8	15	SL	31	7.33	0.70	1.90	4.73	0.62	1.16	2.6	0.43	10.40	3.56
		S	6-22	Bt1	SCL	H	71	10	19	SL		8.09	0.66	6.12	0.78	0.10	9.33	4.9			
		U	22-39	Bt2	CL	VH	52	17	31	SCL		8.03	2.00	19.40	1.98	0.32	18.17	4.2			
		U	39-87	C	SCL	VH	79	7	14	SL		7.83	3.50	27.30	12.80	2.16	9.96	3.1			

BLANCOT SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DS/M meq/100g % meq/100g %									
I	83	S	0-10	A	SL	H	83	15	22	SCL		7.88	0.41	2.06	1.56	0.22	2.17	1.7			
		S	10-20	Bt	CL	H-VH	51	17	32	SCL		8.06	1.00	8.65	1.15	0.15	10.96	2.0			
		U	20-32	Btk	SCL	VH	64	14	22	SCL		8.23	2.30	21.30	2.04	0.29	19.73	1.9			
		U	32-51	C1	SCL	VH	75	8	16	SL		7.87	5.20	51.60	13.30	1.65	18.87	2.2			
		U	51-69	C2	SL	EH	75	8	16	SL		8.48	2.70	26.90	1.70	0.30	26.90	2.0			
III	47	S	0-5	A	SCL	SH	82	10	28	SCL		7.92	0.54	1.34	3.86	0.36	0.95	2.1			
		S	5-22	Bt1	SCL-CL	H-VH	54	11	35	SC/SCL	38	7.95	0.56	4.04	1.66	0.17	4.22	1.9			
		S	22-35	Bt2	CL-SCL	H-VH	52	12	36	SC	47	7.70	1.30	7.38	6.84	0.64	3.82	1.8			
		U	35-50	Btk	SCL	VH-EH	60	11	29	SCL		8.01	1.10	6.88	3.89	0.38	4.76	3.5			
		U	50-60	B/C	SCL	EH	52	15	33	SCL		8.05	1.20	8.06	3.25	0.37	5.99	3.5			

BLANCOT SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS				LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				—%				—%		DS/M	—meq/l—			—%	—meq/100g—			—%
III	48	S	0-6	A	SCL	SH-H	62	10	28	SCL		8.00	0.74	5.50	2.69	0.35	4.48	1.8			
		S	6-17	Bt1	SCL	H-VH	59	9	32	SCL		8.18	0.64	6.70	0.92	0.17	9.07	1.9			
		S	17-30	Bt2	SCL	H-VH	52	11	37	SL	54	8.11	2.30	19.40	3.96	0.50	12.99	2.3	5.37	21.80	18.82
		U	30-48	Bt3	SCL	VH-EH	50	13	37	SL	59	8.14	2.95	23.90	4.82	0.82	14.49	2.9	8.17	22.54	21.12
		U	48-60	Btk	SCL	EH	54	14	32	SCL	54	7.94	1.10	41.30	9.33	2.20	17.20	2.1	5.61	19.02	17.77
III	144	S	0-6	A	SL	SH-H	78	10	14	SL		8.04	0.80	1.34	4.10	0.49	0.88	2.0			
		S	6-18	Bw	SCL	H	74	10	16	SL		8.08	0.43	1.83	2.17	0.35	1.45	2.5			
		U	18-48	2Bt	CL	VH-EH	58	15	27	SCL		7.98	0.73	5.23	1.41	0.28	5.69	3.0			
III	155	S	0-6	A	SL	SH	85	5	10	LS		7.83	0.43	0.91	2.78	0.35	0.73	1.3			
		S	6-18	Bt	SCL	H	78	6	14	SL		7.97	0.85	3.78	1.81	0.34	3.81	1.9			
		S	18-31	Btk	SCL	H-VH	86	11	23	SCL		8.13	0.97	6.17	0.73	0.12	12.53	5.0			
		U	31-43	Btk	CL	VH-EH	18	20	64	C	90	7.64	8.20	59.90	21.70	2.92	17.07	1.9	12.28	42.70	16.14
		U	43-63	2C	C	EH	77	8	17	SL		7.80	4.50	37.00	17.40	2.19	11.82	1.9			

Chipeta Series

The soils in the Chipeta series are classified as Typic Torriorthents, clayey, mixed, (calcareous) mesic, shallow. These shallow, well drained, slowly permeable soils formed in residuum and colluvium from shale and occur on upland pediments.

Typifying pedon: Chipeta silty clay loam, 0 to 5 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1987.

Ap- 0 to 5 inches, light brownish gray (2.4 Y 6/2) silty clay loam, dark grayish brown (2.5 Y 4/2) moist; weak fine subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; few fine discontinuous pores; strongly calcareous; mildly alkaline (pH 7.7); clear smooth boundary. (1 to 5 inches thick).

C- 5 to 13 inches; light brownish gray (2.5 Y 6/2) silty clay, dark grayish brown (2.5 Y 4/2) moist; moderate medium and fine subangular blocky structure; hard, very firm, sticky and plastic; few fine and medium roots; few large continuous pores, few fine discontinuous pores; strongly calcareous; mildly alkaline (pH 7.6); clear wavy boundary. (6 to 10 inches thick).

Cy- 13 to 17 inches; light brownish gray (2.5 Y 6/2) silty clay, dark grayish brown (2.5 Y 4/2) moist; weak, moderately thick platy structure parting to weak, medium blocky; hard, very firm, sticky and plastic; few fine and medium roots; many fine crystals and mycelia-like veins of gypsum; 20 percent un- weathered shale fragments; strongly calcareous; mildly alkaline (pH 7.4) gradual irregular boundary. (3 to 5 inches thick).

Cr- 17 inches; weathered marine shale.

Salinity ranges from moderate to strong. The depth to shale ranges from 5 to 20 inches and the hue from 10 YR to 5 Y. The A horizon is loam or silty clay loam. The C horizon textures are silty clay loam or silty clay. Gypsum content ranges from 0.5 - 10 percent.

There was no suitable topdressing available from this soil. The Chipeta series was described at 6 sites in the survey area. Laboratory samples were not collected because of the limited extent of this series in the survey area.

Doak Series

The soils in the Doak series are classified as Typic Haplargids, fine-loamy, mixed mesic. These deep, well drained soils are on mesas, plateaus, and intermediate terraces. The soils formed in alluvial and eolian deposits derived from sandstone and shale.

Typifying pedon: Doak sandy clay loam, 0 to 5 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1980.

- A- 0 to 5 inches; yellowish brown (10 YR 5/4) sandy clay loam, dark yellowish brown (10 YR 4/4) moist; weak fine granular structure; slightly hard, sticky and plastic; noneffervescent; mildly alkaline; clear smooth boundary.
- Bt1- 5 to 29 inches; yellowish brown (10 YR 5/4) heavy sandy clay loam, dark yellowish brown (10 YR 4/4) moist; moderate medium prismatic structure; very hard, sticky and plastic; thin clay films on ped faces; noneffervescent; mildly alkaline; clear smooth boundary.
- Bt2- 29 to 50 inches; light brown (7.5 YR 6/4) sandy clay loam, brown (7.5 YR 5/4) moist; moderate medium subangular blocky structure; very hard, sticky and plastic; thin clay films on ped faces; disseminated calcium carbonate; strongly effervescent; mildly alkaline; clear smooth boundary.
- Btk- 50 to 60 inches, very pale brown (10 YR 7/3) sandy clay loam, very pale brown (10 YR 7/3) moist; moderate medium subangular blocky structure; hard to very hard, sticky and plastic; filaments of calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.
- C- 60 to 68 inches; light yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist; massive; hard to very hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline.

The solum ranges from 20 to 60 inches thick and depth to calcareous material ranges from 15 to 30 inches. The A horizon has a hue of 10 YR to 7.5 YR. It is a sandy loam or sandy clay loam, and ranges from 27 to 35 percent clay. Reaction ranges from moderately to strongly alkaline. The C horizon has a hue of 7.5 YR to 10 YR. It is loam, sandy clay loam, clay loam. Below 40 inches the texture may vary from loamy sand to clay.

The range of topdressing depth is 7 to 73 inches. The limiting factors for topdressing are dry consistence and bedrock. The Doak series was described at 13 sites in the survey area. Laboratory samples were not collected because of the limited extent of this series at the Navajo Mine.

Fajada Series

The soils in the Fajada series are classified as Typic Natrargids, fine-loamy, mixed, mesic. These moderately deep, well drained, sodium affected soils are on mesas, upland valley bottoms, side slopes, and alluvial fans. The soils formed in alluvium underlain by weathered shale.

Typifying pedon: Fajada loam, 0 to 8 percent slopes.
Location in Area III, site 43.

E- 0 to 3 inches; light yellowish brown (10 YR 6/4)
 clay loam, dark yellowish brown (10 YR 4/6) moist;
 moderate fine granular structure; soft, sticky and
 plastic; slightly effervescent; mildly alkaline;
 abrupt smooth boundary.

Btn- 3 to 8 inches; yellowish brown (10 YR 5/4) clay loam, yellowish brown (10 YR 5/6) moist; moderate fine prismatic structure; very hard, sticky and plastic; common moderately thick clay films on faces of peds and lining pores; strongly effervescent; very strongly alkaline; abrupt smooth boundary.

Btkn1- 8 to 25 inches; yellowish brown (10 YR 5/6) sandy clay loam, dark yellowish brown (10 YR 4/6) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard to very hard, slightly sticky and nonplastic; common thin clay films bridging sand grains; strongly effervescent; calcium carbonate as few fine irregular masses and seams; very strongly alkaline; clear smooth boundary.

Cr- 25 to 40 inches; soft sandstone interbedded with soft shale.

Paralithic contact is at a depth of 20 to 40 inches. The solum is 20 to 30 inches thick. The profile is 25 to 75 percent exchangeable sodium. The A horizon has hue of 10 YR or 7.5 YR. It has a texture of loamy sand to clay. The Bt horizon can be sandy loam to clay loam and ranges from 18 to 35 percent clay. It has a hue of 2.5 Y to 7.5 YR. The paralithic contact is usually shale.

The range of topdressing depth is 0 to 20 inches. The limiting factor for topdressing is SA. The Fajada series was described at 104 sites in the survey area. The laboratory data for this series includes the eolian sands that occur on the surface of the soil.

FAJADA SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL										
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			↓				%					DSM meq/100g %										
III	43	S	0-3	E	CL	S	35	21	44	C	47	8.09	0.90	7.89	1.73	0.17	8.09	4.8				
		U	3-8	Btk	SCL-CL	VH	38	18	44	C	47	8.30	0.86	8.25	0.74	0.09	12.81	5.7	4.68	26.00	18.50	
		U	8-23	Btk	CL	H-VH	43	14	43	C	61	7.99	5.80	51.80	7.28	0.51	28.28	6.2				
		U	23-40	Cr	C	H	25	22	53	C	69	7.82	9.00	72.20	17.90	1.97	22.91	5.3	9.10	29.50	13.97	

FAJADA SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			↓				%					DSM meq/100g %									
I	20	U	0-4	E	SL	VH	72	16	12	SL	32	8.84	1.20	12.60	0.91	0.11	17.84	2.0	2.48	9.48	21.84
		U	4-17	Btk	SCL	SH-H	40	35	25	L		8.54	6.80	104.00	16.80	3.07	33.00	1.7			
		U	17-35	C	SCL	SH	46	24	28	SCL		8.77	5.30	83.00	3.08	1.81	54.20	1.1			
III	184	S	0-4	A	SCL	H	74	8	20	SCL/SL		8.03	0.42	1.95	2.06	0.23	1.84				
		S	4-17	C	SCL	H	72	8	20	SCL/SL		8.16	0.50	4.90	0.85	0.15	1.50				
III	438	S	0-4	A	LS	SH	79	7	14	SL		8.03	0.70	1.47	3.58	0.65	1.01	0.8			
		S	4-12	C	LS	H	76	9	13	SL		8.05	0.21	0.31	1.43	0.23	0.58	1.3			
		S	12-16	Bt	LS-SL	H-VH	74	9	17	SL		7.79	0.54	2.71	2.20	0.48	2.34	1.7			
		U	16-35	Btk	CL	EH	26	22	50	C		8.16	0.84	6.58	1.30	0.23	7.50	5.7			

FAJADA SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL				SAT	LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS		pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			ft-				%			-%	DS/M	meq/l			-%	-meq/100g-		-%-			
IV	434	S	0-4	A	SL	SH	78	11	11	SL	27	7.23	0.76	1.06	4.28	1.20	0.65	1.4			
			4-16	Bw	SL	H	83	6	11	SL	28	7.53	0.44	1.80	1.85	0.50	1.48	2.4			
IV	590	S	0-12	C	S	SH	64	3	13	LS/SL	28	7.76	0.32	1.40	1.53	0.17	1.52	1.4			

Farb Series

The soils in the Farb series are classified as Lithic Torriorthents, loamy mixed (calcareous) mesic. These shallow and very shallow, excessively drained soils are on upland hills, mesas, and breaks. The soils formed in residuum derived from sandstone.

Typifying pedon: Farb sandy loam, 0 to 8 percent slopes. Location is Area III, site 31.

- A- 0 to 3 inches; light yellowish brown (10 YR 6/4) sandy loam, brown (10 YR 5/3) moist; weak medium granular structure; slightly hard, nonsticky and nonplastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bk- 3 to 9 inches; light yellowish brown (10 YR 6/4) sandy loam, brown (10 YR 6/4) sandy loam, brown (10 YR 5/3) moist; weak medium sub-angular blocky structure; slightly hard nonsticky and nonplastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Crk- 9 to 26 inches; very pale brown (10 YR 7/3) sandy loam, pale brown (10 YR 6/3) moist; massive; hard, slightly sticky and slightly plastic; disseminated calcium carbonate; violently effervescent; moderately alkaline; abrupt smooth boundary.
- R- 26 inches; calcareous sandstone.

Depth to bedrock or paralithic contact ranges from 5 to 20 inches. The A horizon is sandy loam. It has a hue of 10 YR or 2.5 Y. The C horizon is loamy sand, or sandy loam. It has a hue of 10 YR or 2.5 Y.

The range of topdressing depth is 0 to 20 inches. The limiting factor for topdressing is bedrock. The Farb series was described at 48 sites in the survey area.

FARB SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%-					DSM -meq/100g-									
IH	31	S	0-3	A	SL	SH	74	12	14	SL		6.16	1.78	15.80	3.11	0.85	11.23	2.3			
		S	3-9	Bk	SL	SH	75	11	14	SL		6.03	1.20	10.80	2.71	0.52	8.53	4.3			
		U	9-26	Ck	SL	H	71	11	18	SL		6.01	1.28	11.50	3.18	0.44	6.57	10.6			

FARB SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%-					DSM -meq/100g-									
EQ-9	5	S	0-8	C	LS-SL	SH	87	2	11	LS	31	7.67	0.51	1.08	2.72	0.39	0.87	4.3			

Fruitland Series

The soils in the Fruitland series are classified as Typic Torriorthents, coarse-loamy, mixed (calcareous) mesic. These deep, well drained soils are on valley side slopes, mesas and alluvial fans and formed in moderately coarse textured alluvium derived from sandstone and shale.

Typifying pedon: Fruitland sandy loam, 0 to 5 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1980.

- A- 0 to 7 inches; brown (10 YR 5/3) sandy loam, dark brown (10 YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; few fine pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 10 inches thick).
- C1- 7 to 18 inches; pale brown (10 YR 6/3) sandy loam, brown (10 YR 5/3) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few fine pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (9 to 30 inches thick).
- C2- 18 to 42 inches; light yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many fine pores; slightly effervescent; moderately alkaline (pH 8.0); clear gradual boundary. (20 to 42 inches thick).

C3- 42 to 60 inches; light yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist massive; soft, very friable, nonsticky and nonplastic; few fine roots; few fine pores; slightly effervescent; moderately alkaline (pH 8.0).

The A horizon has textures of loam, sandy loam or sandy clay loam and a hue of 2.5 Y or 10 YR. The C horizon has textures of sandy loam and below 40 inches strata of sand or loam sand. It has a hue of 10 YR or 7.5 YR.

The range of topdressing depth is 6 to 49 inches. The limiting factors for top-dressing are bedrock, dry consistence and SA. The Fruitland series was described at 4 sites in the survey area. Samples from a typifying pedon were not collected.

FRUITLAND SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-			—%				—%		DS/M	—meq/—			—%	—meq/100g—			—%	
SAMPLE NOT TAKEN																					

FRUITLAND SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-			—%				—%		DS/M	—meq/—			—%	—meq/100g—			—%	
IV	345	S	0-6	A	SL	SH	72	13	15	SL	26	7.54	0.51	1.80	2.69	0.53	1.26	6.6			
		S	6-16	C(Bw)	GSL	H-VH	71	13	16	SL	28	7.85	0.50	3.93	1.00	0.16	5.18	6.2			
		U	16-35	C(Bw)	GSL	VH	73	13	14	SL	32	6.36	1.30	13.19	0.64	0.15	20.99	6.8			
EQ-15	27	S	10-39	C2	GLS	H	72	10	16	SL	27	7.55	3.40	17.04	22.28	3.20	4.77	3.5			

Gilco Series

The soils in the Gilco series are classified as Typic Torrifuvents, coarse-loamy, mixed (calcareous), mesic. These deep, well drained soils are on flood plains and terraces. The soils formed in calcareous alluvium derived from sandstone and shale.

Typifying pedon: Gilco loamy sand, 0 to 3 percent slopes. Location is Area IV, site 245.

- C1- 0 to 5 inches; light yellowish brown (10 YR 6/4) sandy clay loam, yellowish brown (10 YR 5/4) moist; massive; hard, nonsticky and nonplastic; non-effervescent; moderately alkaline, clear smooth boundary.
- C2- 5 to 30 inches; light yellowish brown (10 YR 6/4) stratified silt loam, loam, fine sandy loam and loamy sand, dark yellowish brown (10 YR 4/4) moist; massive; hard, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline; clear smooth boundary. (10 to 40 inches thick)
- C3- 30 to 75 inches; light yellowish brown (10 YR 6/4) stratified loam and fine sandy loam and loamy sand, dark yellowish brown (10 YR 4/4) moist; massive; hard and very hard, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline.

The control section ranges from 5 to 18 percent clay and averages sandy loam. Coarse fragments are usually less than 5 percent, but range from 0 to 15 percent. The A horizon when present has hue ranging from 2.5 Y to 7.5 YR. It is usually a sandy loam. The C horizon has hue of 2.5 Y through 7.5 YR and is moderately or strongly alkaline. Calcium carbonate equivalent ranges from 1 to 12 percent and visible calcium carbonate is limited to thin discontinuous layers.

The range of topdressing depth is 0 to 84 inches. The limiting factors for topdressing are dry consistence, SA and bedrock. The Gilco series was described at 46 sites in the survey area.

GILCO SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DS/M meq/100g % meq/100g %									
IV	245	S	0-5	A	SCL	H	87	14	19	SL		8.08	0.68	3.45	2.60	0.38	2.83	2.3			
		S	5-30	C1	SL	H	74	8	18	SL		7.83	6.00	45.87	19.34	3.24	13.65	2.5			
		U	30-75	C2	LS-SL	H-VH	86	5	9	LS		8.03	6.00	78.54	12.09	3.29	28.32	1.6			

GILCO SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DS/M meq/100g % meq/100g %									
I	85	S	0-5	A	LS	S	75	9	16	SL		7.48	0.75	3.30	3.20	0.56	2.41	1.3			
		S	5-22	C1	SL	H	77	7	16	SL		7.68	0.94	2.49	5.28	0.79	1.43	1.4			
		S	22-69	2C2	SL	H-VH	73	9	18	SL		7.97	0.71	5.84	1.32	0.18	6.74	1.5			
I	146	S	0-6	A	SCL	SH	32	27	41	C		7.85	0.98	5.79	6.69	3.83	2.40				
		S	6-79	C1-6	SL-LS	SH	51	18	31	SCL		7.68	4.10	31.00	3.91	9.10	1.60				
III	2	S	0-6	C1	FS	S	73	12	15	SL		8.02	0.37	1.62	2.07	0.23	1.51	2.6			
		S	6-24	C2	FS	S	75	9	16	SL		7.90	1.40	10.00	5.52	0.61	5.71	1.8			
		S	24-42	C3	FS	S	76	7	17	SL		8.10	0.51	4.59	1.08	0.20	5.75	1.8			
		S	42-60	C4	FS	S	73	8	19	SL		7.81	2.20	14.30	9.89	1.44	6.01	2.4			

GILCO SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					SAT	LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	pH		E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			in-				%				%	DS/M	meq/l			%	meq/100g		%			
III	2R	S	60-90				84	4	12	LS		7.79	2.86	14.30	11.20	1.94	5.58	2.5				
		S	90-120				86	4	10	LS		7.91	2.49	16.50	8.56	1.70	7.28	3.6				
		S	120-150				76	12	12	SL	30	7.84	4.90	42.20	8.55	3.01	17.55	3.7	2.47	8.32	14.42	
		U	150-180				67	13	20	SCL/SL	62	6.39	2.21	23.60	1.72	0.58	22.19	3.3	4.98	12.89	27.15	
		U	180-200				25	21	54	C	78	4.97	11.90	119.00	5.20	9.38	44.10	0.1				
		U	200-220				45	21	34	CL		4.96	2.10	140.00	4.28	11.38	50.03	0.7				
III	75	S	0-18	C1	FS-LFS	SH	86	9	5	LS	33	7.86	1.24	4.33	6.45	1.19	1.97	2.0				
		S	18-40	C2	SL	H	75	10	15	SL		7.97	1.07	7.41	4.06	0.59	4.86	2.3				
		S	40-60	C3	FS-LFS	H	86	4	10	LS	37	7.86	2.50	9.56	17.70	2.96	2.97	1.8				
IV	216	S	0-7	A	SL	SH-H	63	17	20	SCL/SL		6.01	0.80	2.49	2.95	0.34	1.94	1.7				
		S	7-42	C	SL	H	74	8	18	SL	18	6.09	2.50	20.80	3.96	0.51	13.75	2.1	3.27	8.84	32.40	
		S	42-58	2C	GSL	H	80	10	10	LS	14	7.82	5.50	46.42	12.89	2.68	16.64	7.8	3.39	7.73	35.45	
		S	58-79	3C	LS	H-VH	94	0	6	S		7.75	2.70	16.63	10.91	1.88	6.63	1.8				
IV	232	S	0-4	A	LS	SH	67	15	18	SL		8.17	0.61	4.76	1.25	0.17	5.65	2.9				
		U	4-25	C1	SL-LS	VH	68	13	19	SL	22	7.86	5.80	52.80	13.46	2.24	18.85	2.1	5.14	11.30	35.22	
		S	25-64	C2	SL	H	69	13	16	SL		7.63	5.20	43.67	14.32	2.03	15.27	2.2				
IV	770	U	0-10	C1	SCL	VH	68	17	15	SL	35	7.86	0.48	3.41	1.14	0.27	4.06	2.0				
		U	10-39	C2	SL	VH	81	9	10	LS	33	6.27	0.85	7.19	0.56	0.17	11.80	2.1				

Grieta Series

The soils of the Grieta series are classified as Typic Haplargids, fine-loamy, mixed mesic. These deep, well drained, moderately permeable soils are on plateaus and mesas developed from eolian sediments.

Typifying pedon: Grieta loamy fine sand, 0 to 5 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1987.

- A- 0 to 7 inches; brown (10 YR 5/3) loamy fine sand, dark brown (10 YR 4/3) moist; weak fine granular structure; soft, nonsticky and nonplastic; mildly alkaline; clear smooth boundary.
- Bt1- 7 to 14 inches; yellowish brown (7.5 YR 5/4) sandy clay loam, dark brown (7.5 YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, sticky and plastic; common clay skins on faces of peds; moderately alkaline; clear smooth boundary.
- Bt2- 14 to 21 inches; pale brown (10 YR 6/3) clay loam, brown (10 YR 4/3) moist; weak medium subangular blocky structure; slightly hard, slightly sticky and slightly plastic; few fine discontinuous clay films in root channels, clay bridges between sand grains; 5 percent pebbles; slightly effervescent; moderately alkaline; clear smooth boundary.

- Bk1- 21 inches to 38 inches; light yellowish brown (10 YR 6/4) coarse sandy loam, dark yellowish brown (10 YR 4/4) moist; massive; slightly hard, slightly sticky and nonplastic; 10 percent pebbles; strongly effervescent; calcium carbonate disseminated and few fine irregular soft masses and coatings underside of pebbles; clear smooth boundary.
- Bk2- 38 to 60 inches; white (10 YR 8/2) coarse sandy loam, yellowish brown (10 YR 5/4) moist; massive; hard, slightly sticky and nonplastic; 2 percent pebbles; violently effervescent; calcium carbonate disseminated and as coatings on sand grains and common fine irregularly shaped soft masses; moderately alkaline.

The depth of the calcic layer ranges from 20 to 40 inches. The hue for all horizons range from 5 YR through 10 YR. The clay content of the control section ranges from 18 to 35 percent and the calcium carbonate equivalent of the Bk is more than 15 percent.

The range of topdressing depth is 6 to 33 inches. The limiting factors for topdressing are bedrock and carbonates. The Grieta series was described at 18 sites in the survey area. Samples from a typifying pedon were not taken.

GRIETA SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in			%				%		DS/M	meq/l			%	meq/100g		%		
SAMPLE NOT TAKEN																					

GRIETA SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in			%				%		DS/M	meq/l			%	meq/100g		%		
IV	265	S	0-4	A	CL	SH	61	20	19	SL			0.51	1.08	1.97	0.88	0.84				
		S	4-16	Bt	CL	H-VH	56	17	27	SCL			0.36	1.80	1.43	0.27	1.74				
IV	416	S	0-6	A	FSL	SH	82	8	12	SL	27	7.85	0.48	0.87	2.77	0.57	0.87	1.5			
		U	6-20	Bt	SCL	EH	73	7	20	SCL	31	7.70	0.48	2.74	1.39	0.44	2.88	3.8			
		U	20-35	Btk	SCL	VH	59	20	21	SCL	29	8.03	0.80	7.39	0.66	0.22	11.02	21.9			

Hoskey Series

The soils in the Hoskey series are classified as Typic Natrargids, fine, mixed mesic. These deep, well drained, slowly permeable, sodic soils formed in alluvium derived from shale and sandstone on alluvial fans and terraces.

Typifying pedon: Hoskey loam, 0 to 3 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service 1987.

- A- 0 to 2 inches; light yellowish brown (10 YR 6/4) loam, dark yellowish brown (10 YR 4/4) moist; granular; soft, slightly sticky and slightly plastic; strong effervescent; moderately alkaline; clear smooth boundary.
- Btkn- 2 to 6 inches; yellowish brown (10 YR 5/4) clay loam, dark yellowish brown (10 YR 4/4) moist; weak medium prismatic structure; hard, sticky and plastic; common thin; clay films on faces of peds and lining pores; strongly effervescent, secondary calcium carbonates in few fine irregularly shaped accumulations on faces of peds; strongly alkaline; clear smooth boundary.
- Btky- 6 to 14 inches; light yellowish brown (10 YR 6/4) clay, yellowish brown (10 YR 5/4) moist; moderate medium prismatic structure parting to moderate coarse subangular blocky; hard, sticky and plastic; few thin clay films on faces of peds and lining pores; secondary fine sand sized gypsum crystals in few fine irregularly shaped accumulations on faces

of peds and lining pores; strongly effervescent, secondary calcium carbonates in few fine irregularly shaped accumulations on faces of peds; moderately alkaline; abrupt wavy bounds.

2Byk1- 14 to 21 inches; light gray (10 YR 7/2) clay loam, light yellowish brown (10 YR 6/4) moist; moderate coarse subangular blocky structure; hard, sticky and plastic; secondary fine sand sized gypsum crystals in many fine and medium irregularly shaped accumulations on faces of peds; strongly effervescent, secondary calcium carbonates in few medium irregularly shaped accumulations of faces of peds and on rock fragments; mildly alkaline; clear smooth boundary.

2Byk2- 21 to 27 inches; pale brown (10 YR 6/3) clay loam, brown (10 YR 5/3) moist; moderate coarse subangular blocky structure; slightly hard, sticky and plastic; secondary fine and medium sand sized gypsum crystals in few medium irregularly shaped accumulations on ped faces; slightly effervescent, secondary calcium carbonates in few medium irregularly shaped accumulations on ped faces; mildly alkaline; clear wavy boundary.

3Byk3- 27 to 39 inches; pale brown (10 YR 6/3) clay loam, brown (10 YR 5/3) moist; weak coarse subangular blocky structure; hard, sticky and plastic; secondary medium sand sized gypsum crystals in few fine and medium irregularly shaped accumulations on faces of peds; carbonates in very few medium irregularly shaped accumulations on faces of peds;

moderately alkaline; abrupt irregular boundary.

4BC- 39 to 60 inches; light yellowish brown (2.5 Y 6/4) and gray (10 YR 6/1) silty clay, yellowish brown (2.5 Y 5/4) and gray (10 YR 5/1) moist; weak very coarse subangular blocky structure; very hard, sticky and plastic; few coarse sand and fine pebble sized primary gypsum crystals throughout matrix; slightly effervescent; moderately alkaline.

There is not suitable topdressing available from this soil. The limiting factors for topdressing are SA, texture and dry consistence. The Hoskey series are described at 17 sites in the survey area. Samples were not collected because this soil is not limited extent at the Navajo Mine.

Huerfano Series

The soils of the Huerfano series are classified as Typic Natrargids, loamy, mixed, mesic, shallow. These shallow, well drained, sodium-affected soils are on mesas, and upland valley bottoms. The soils formed in alluvium and residium derived from shale, siltstone and sandstone.

Typifying pedon: Huerfano sandy clay loam, 0 to 1 percent slopes. Location is Area III, site 41.

E- 0 to 3 inches; light yellowish brown (2.5 Y 6.4) clay loam, yellowish brown (10 YR 5/4) moist; moderate, medium granular structure; slightly hard, sticky and plastic; disseminated carbonate; strongly effervescent; moderately alkaline; SA 11; clear smooth boundary.

- Btn- 3 to 12 inches; light yellowish brown (2.5 Y 6/4) clay loam, yellowish brown (10 YR 5/4) moist; moderate medium subangular blocky structure; hard, sticky and plastic; disseminated carbonate; violently effervescent; moderately alkaline; SA 13-16; clear smooth boundary.
- Cr- 12 to 24 inches; light yellowish brown (2.5 Y 6/4) silty clay, olive (5 Y 5/3) moist/strong fine angular blocky structure; slightly hard, sticky and plastic; disseminated calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.
- R- 24 inches; shale.

Paralithic contact ranges from 10 to 20 inches. The profile is 25 to 75 percent exchangeable sodium. The A horizon has a hue of 10 YR or 2.5 Y and the texture may range from loamy sand to clay. The B horizon has range from sandy clay loam to clay.

The range of topdressing depth is 0 to 10 inches. The limiting factors for topdressing are SA, texture, dry consistence and bedrock. The Huerfano series was described at 241 sites in the survey area.

HUERFANO SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL				SAT	LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS		pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%				%	DS/M	meq/			%	meq/100g			%	
III	41	U	0-3	E	CL	SH	30	20	50	C	81	8.24	2.20	19.10	4.35	0.41	12.38	3.3	5.80	23.85	19.41
		U	3-12	Bth	CL	H	26	20	52	C	70	8.28	3.00	26.80	3.21	0.40	19.95	2.7	10.02	27.43	29.69
		U	12-24	Cr	C	SH	14	46	38	SICL	70	8.02	8.20	99.20	8.88	2.13	46.74	2.4			
		U	24-60	R		H-VH	16	44	38	SICL	117	7.88	7.00	74.10	7.45	2.97	32.46	5.0			

HUERFANO SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL				SAT	LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS		pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%				%	DS/M	meq/			%	meq/100g			%	
I	120	S	0-8	Bth	CL	H	52	22	26	SCL		6.42	0.91	8.47	0.74	0.10	13.07	5.2			
		U	6-20	Bth	CL	H	53	16	29	SCL		8.01	6.60	70.00	17.40	1.17	22.97	5.5			
		U	20-45	Cr	SCL	EH	56	12	32	SCL		8.26	7.40	77.90	17.10	1.85	25.31	5.4			
IV	529	U	0-4	Bth	C	VH	47	20	33	SCL	47	8.51	0.88	8.49	0.43	0.17	15.50	5.7			
		U	4-10	By	C	VH	24	39	37	CL	69	8.02	3.00	61.03	19.92	2.58	18.20	19.9			
IV	692	U	0-2	A/E	C	VH	50	16	34	SCL	39	6.21	2.35	26.80	0.86	0.41	33.40	10.8			
		U	2-8	Bth	C	VH	46	23	31	CL	73	6.72	1.80	20.90	1.12	0.37	24.21	13.1			
		U	8-20	By	C	VH	7	54	39	SICL	117	6.10	7.00	85.67	19.35	2.61	25.65	16.3			

Jocity Series

The soils in the Jocity series are classified as Typic Torrifluvents, fine-loamy, mixed (calcareous) mesic. These deep, well drained soils are on flood plains and low river terraces. The soils formed in moderately fine textured and medium textured alluvium derived from sandstone and shale.

Typifying pedon: Jocity sandy loam, 0 to 3 percent slopes. Location is Area IV, site 216.

- A- 0 to 5 inches; light yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist; weak thin platy structure; slightly hard; slightly sticky and slightly plastic; disseminated calcium carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.
- C1- 5 to 44 inches; light yellowish brown (10 YR 6/4) sandy loam/sandy clay loam (stratified), yellowish brown (10 YR 5/4) moist; massive; hard sticky and plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline.
- C2- 44 to 91 inches; light brown (10 YR 6/4) fine sandy loam, yellowish brown (10 YR 5/4) moist; massive; slightly hard, slightly plastic; moderately alkaline.

The control section is highly stratified sands, loamy sands, sandy loams, sandy clay loams, clay loams, averaging from 18 to 34 percent clay. The A horizon ranges from loamy sand to clay loam. It has hue of 2.5 Y to 7.5 YR. The C horizon has hue of 2.5 Y to 7.5 YR and may have gravel from 0 to 15 percent.

The range of topdressing depth is 0 to 91 inches. The limiting factors for topdressing are SA and dry consistence. The Jocity series was described at 98 sites in the survey area.

JOCITY SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-			%					DS/M meq/100g % meq/100g %										
IV	216	S	0-5	A	SL	SH	74	8	18	SL		8.15	0.85	5.44	1.18	0.13	6.72	2.1			
		S	5-44	C1	SL	SH-H	80	16	24	SCL	25	7.94	3.90	31.24	10.33	1.41	12.89	2.1	4.21	14.90	23.42
		S	44-91	C2	SL	SH-H	61	13	26	SCL	27	8.34	2.00	15.61	1.84	0.36	14.88	2.3	5.13	15.30	30.78

JOCITY SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-			%					DS/M meq/100g % meq/100g %										
I	122	S	0-6	C1	CL	SH	33	32	35	CL		8.07	0.62	5.17	1.08	0.19	6.49	4.8			
		S	6-15	C2	SCL	SH	56	16	28	SCL		8.16	2.20	18.80	5.38	0.56	10.91	5.2			
		S	15-30	C3	SL	SH	63	18	21	SCL		6.09	3.50	32.30	6.11	1.05	17.07	5.8			
I	127	S	0-11	C1	CL	H-VH	35	29	36	CL		7.91	0.91	7.42	1.84	0.23	7.67	2.4			
		S	11-14	C2	SCL	H	53	19	26	SCL		8.30	2.80	16.10	2.08	24.90	15.01	2.9			
		S	14-34	C3	SCL	H	53	18	29	SCL		8.05	6.10	6.95	17.80	1.88	2.23	4.3			
		U	34-60	C4&5	SCL-CL	H	49	14	37	SC		8.05	7.10	89.10	17.00	1.78	28.09	2.8			
		U	60-79	C6	SL	SH	67	14	19	SL		7.94	7.00	81.40	17.60	2.81	25.48	4.2			
I	148	S	0-4	A	CL	SH															
		U	4-79	C1-6	SCL-CL	SH-H	47	21	32	SCL		7.94	5.90	85.20	6.39	2.33	40.80	2.1			

JOCITY SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL					LABORATORY-CHEMICAL										
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%	%	%		%		DS/M	meq/l	meq/l	meq/l		%	meq/100g		%
II	26	S	0-4	A	CL	SH	48	21	33	SCL		7.79	0.85	5.53	2.49	0.29	4.89	3.4			
		S	4-7	C1	CL	H	37	28	37	CL		7.94	1.80	10.70	4.85	0.47	8.56	3.5			
		S	7-79	C2	SCL	H	48	19	33	SCL		7.71	3.25	19.60	19.50	1.77	8.07	3.1			
III	4	S	0-4	A	LFS-VFSL	L	52	22	26	SCL		8.01	0.58	2.90	2.70	0.28	2.37	3.5			
		S	4-17	C1	VFSL	S-SH	56	17	27	SCL		8.75	0.50	35.04	19.13	2.55	10.84	3.4			
		S	17-26	2C2	VFSL	SH-H	53	19	28	SCL	44	7.89	3.40	30.37	8.74	0.88	15.88	3.9	3.42	19.40	10.72
		U	28-38	3C3	VFSL	VH	61	18	21	SCL	44	8.18	3.20	30.18	3.04	0.41	22.96	5.1	3.92	17.80	14.55
		U	38-51	4Btk	SCL-CL	VH	50	16	34	SCL		8.10	8.40	73.80	13.08	3.05	25.83	2.4			
		U	51-80	5Cr	C	VH	20	28	54	C	114	7.78	8.00	88.00	12.72	4.18	23.39	0.9			
III	189	S	10-39	C	SL-SCL	SH-H	53	17	30	SCL		7.62	3.80	30.70	19.20	1.87	8.46	3.9			
III	229	U	0-18	C	SL	VH	78	8	14	SL	59	8.07	5.70	58.90	11.80	2.40	22.28	2.4	5.09	8.94	18.01
IV	212	S	0-13	A-C	SL	SH	60	5	15	SL		7.97	0.52	3.08	2.32	0.20	2.74	3.1			
		S	13-32	2C	SL	SH	60	13	27	SCL		7.87	5.00	41.03	13.58	2.56	14.45	2.5	4.97	46.80	24.52
		U	32-52	3Btmb	SL-SCL	H-VH	66	12	22	SCL		6.00	3.90	35.04	8.78	1.18	17.81	2.0			
		U	52-81	4C	GSL	VH	82	8	12	LS	17	8.19	2.90	27.81	2.49	0.46	22.73	7.1	3.84	7.27	40.75
IV	223	S	0-5	A	CL	H-SH	49	23	28	SCL		7.19	0.92	3.98	5.05	0.71	2.35	3.4			
		S	5-22	C1	CL	H-VH	58	21	23	SCL		7.26	3.20	25.19	11.48	2.38	9.57	3.0			
		U	22-35	C2	C	EH	22	21	57	C	89	7.82	3.60	31.13	7.04	1.37	15.18	1.8	9.62	37.50	19.92
IV	712	S	0-14	C1	LS	SH-H	79	9	12	SL	30	7.99	0.54	3.51	1.32	0.44	3.74	7.0			
		U	14-39	C2	CL	VH	54	24	22	SCL	53	8.13	4.10	38.48	4.77	0.91	22.83	5.4			
		U	39-79	C3	SL	H	69	15	16	SL	33	8.04	7.20	66.25	19.95	3.42	19.38	5.7			

JOCITY SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS				LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%				%		DS/M	meq/l				%	meq/100g		
IV	719	U	0-12	C1	CL	VH	83	21	16	SL	46	7.98	9.00	87.43	23.37	2.14	24.48	11.8			
EQ-9	56	S	0-4	A	CL	S	36	30	32	CL	49	7.10	1.00	2.15	4.53	1.94	1.20	3.3			
		S	4-14	Bt	CL	H	37	31	32	CL	54	7.71	1.00	5.51	4.12	1.08	3.42	1.4			
		S	14-24	Bk	CL	SH	36	30	32	CL	53	7.01	4.80	29.87	22.22	6.54	7.62	1.5			
		S	24-89	C	CL	SH	39	26	33	CL	50	7.37	5.80	34.93	26.38	6.71	6.59	1.8			
EQ-9	66	S	0-10	C	CL	SH	42	35	23	L	42	7.75	0.98	3.11	5.74	1.02	1.69	2.5			
		S	10-39	C	CL	SH	42	35	23	L	40	7.70	5.30	31.54	26.74	6.87	7.89	2.5			
EQ-9	69	S	10-39	C	CL	SH	42	35	23	L											
EQ-9	73	U	16-30	C	C	EH	16	32	50	C	113	7.80	4.70	36.77	14.87	2.22	12.65	2.5			
EQ-11/12	13	S	0-12	C1	CL	SH	43	28	29	CL	44	7.33	2.80	7.72	22.13	6.50	2.04	2.3			
		S	12-22	C2	CL-L	SH	49	22	29	SCL	42	7.26	3.10	12.38	22.60	6.21	3.26	1.5			
		S	22-31	C3	SL	SH	80	9	11	LS/SL	36	7.70	3.20	10.62	24.12	6.37	2.72	1.0			
EQ-11/12	16	S	0-6	C1	SL	SH	74	11	15	SL			0.81	1.62	4.69	0.90	0.97				
		S	6-20	C2	CL-L	H	60	18	22	SCL			2.30	6.74	17.91	2.84	2.09				
		S	20-47	C3	CL	SH-H	43	25	32	CL			3.10	12.33	22.92	4.63	3.32				

Mack Series

The soils in the Mack series are classified as Typic Haplargids, fine-loamy, mixed mesic. These deep, well drained soils are on mesas and plateaus. The soils formed in alluvium derived from sandstone and shale.

Typifying pedon: Mack sandy loam, 0 to 3 percent slopes. Location is Area III, site 44.

- A- 0 to 5 inches; lightly yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist; weak platy to weak medium subangular blocky structure; slightly hard, nonsticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bt- 5 to 13 inches; light yellowish brown (10 YR 6/5) sandy clay loam, yellowish brown (10 YR 5/4) moist; weak prismatic parting to moderate medium subangular blocky structure; hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; thin clay films on ped faces; strongly effervescent; moderately alkaline; clear smooth boundary.

- Btk- 13 to 21 inches; yellowish brown (10 YR 5/4) sandy clay loam, yellowish brown (10 YR 5/4) moist; moderate medium prismatic structure; hard, slightly sticky and slightly plastic; thin clay films on ped faces; filaments and disseminated calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.
- Bk- 21 to 28 inches; light gray (10 YR 7/2) gravely sandy clay loam, pale brown (10 YR 6/3) moist; massive; hard to very hard, slightly sticky and slightly plastic; soft masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.
- 2Bk- 28 to 42 inches; light yellowish brown (10 YR 6/4) gravely loamy sand, yellowish brown (10 YR 5/4) moist; massive; hard, nonsticky and nonplastic; discontinuous layer of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.
- 2C- 42 to 60 inches; light yellowish brown (10 YR 6/4) loamy sand, yellowish brown (10 YR 5/4) moist; massive; hard, nonsticky and nonplastic, disseminated calcium carbonate; strongly effervescent; moderately alkaline.

Thickness of solum ranges from 15 to 30 inches. The A horizon ranges in hue from 10 YR to 7.5 YR. It is a sandy loam, loamy sand or sandy clay loam. The Bt horizon ranges in hue from 10 YR to 5 YR. It is clay loam, sandy loam, or sandy clay loam and ranges in clay from 18 to 35 percent. The Bk is a calcic horizon and ranges in hue from 10 YR to 5 YR. It is gravelly and has textures of clay loam, sandy loam or sandy clay loam and ranges from 15 to 40 percent calcium carbonate equivalent. This layer can be an unsuitable source of topdressing because it is high in calcium carbonate and usually has a very hard dry consistence. The C horizon ranges in hue from 10 YR to 7.5 YR. It is loamy sand to sandy clay loam and has thin layers of deposited calcium carbonate.

The range of topdressing depth is 0 to 94 inches. The limiting factors for topdressing are carbonates, rock fragments and dry consistence. The Mack series was described at 38 sites in the survey area.

MACK SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				---	---	---		---		DS/M	---	---	---	---	---	---	---	---
III	44	S	0-5	A	FSL	SH	72	10	18	SL	25	8.31	2.70	17.45	2.74	0.38	13.97	1.8	1.31	11.20	7.77
		S	5-13	Bt	FSL	H	67	11	22	SCL		8.01	1.30	12.05	2.78	0.27	9.79	3.2			
		S	13-21	Btk	SL	H	67	12	21	SCL		7.85	1.90	13.44	4.80	0.52	8.24	4.2			
		S	21-28	Bk	SL	H-VH	88	9	23	SCL	32	8.24	1.80	13.81	1.96	0.23	13.20	19.2	1.71	9.25	13.73
		S	28-42	2Bk	GLS	H	88	3	9	LS	26	7.93	5.20	39.53	17.00	3.05	12.48	3.5	1.58	5.55	9.91
S	42-60	2C	SL	H	67	4	9	LS	26	7.92	4.80	33.97	17.47	3.35	10.53	2.9					

MACK SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				---	---	---		---		DS/M	---	---	---	---	---	---	---	---
III	296	S	0-4	A	SCL	SH	85	13	22	SCL		7.97	0.48	2.08	2.84	0.38	1.70	2.4			
		S	4-13	Bt	SCL	H	80	15	25	SCL		8.14	0.81	4.74	1.01	0.17	8.04	2.9			
		S	13-24	Btk1	SCL	H	82	18	20	SCL/SL		8.36	0.65	5.40	1.12	0.19	8.87	3.3			
		S	24-37	Btk2	SL	H-VH	72	10	18	SL		8.19	1.30	12.20	1.87	0.35	12.14	3.8			
		U	37-48	Btk3	SCL	H-VH	63	8	29	SCL		7.87	4.00	28.20	13.30	3.64	9.00	20.0			
		S	48-83	C	SL	H	63	28	11	SL		7.70	3.70	21.80	19.80	5.20	8.17	4.2			

Mayqueen Series

The soil in the Mayqueen series are classified as Typic Haplargids, coarse-loamy, mixed mesic. The deep, somewhat excessively drained soils are on stabilized dunes on mesas and plateaus. The soils formed in eolian sand and alluvium derived from sandstone and shale.

Typifying pedon: A Mayqueen loamy sand, 0 to 8 percent slopes. Location is Area III, site 77.

A- 0 to 8 inches; light yellowish brown (10 YR 6/4) loamy sand, yellowish brown (10 YR 5/4) moist; weak medium subangular blocky structure; soft, nonsticky and nonplastic; noneffervescent; moderately alkaline; clear smooth boundary.

Bw- 8 to 30 inches; light yellowish brown (10 YR 6/4) loamy sand, yellowish brown (10 YR 5.4) moist; weak medium subangular blocky structure; slightly hard, nonsticky and nonplastic; noneffervescent; moderately alkaline; clear smooth boundary.

Bt- 30 to 48 inches; light yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist; moderate coarse subangular blocky structure; hard, nonsticky; nonplastic; noneffervescent; moderately alkaline; clear smooth boundary.

2Bt- 48 to 60 inches; light yellowish brown (10 YR 6/4) sandy clay loam, yellowish brown (10 YR 5/4) moist; moderate medium prismatic structure; hard to very hard, slightly sticky and slightly plastic; then continuous clay film; disseminated calcium carbonate; strongly effervescent; moderately alkaline.

The solum is 10 to 40 inches thick and the average texture of the control section is sandy loam with a range of 10 to 18 percent clay. The A horizon has a hue of 7.5 YR or 10 YR. It is loamy sand or sandy loam. The B and Bt horizon is sandy loam. It has hue of 5 YR to 10 YR. The subsoil is typically a buried soil or C horizon that is sand, loamy sand, sandy loam or sandy clay loam. It has hue of 5 YR to 10 YR. This soil tends to be more sandy than Shiprock soils.

The range of topdressing depth is 14 to 89 inches. The limiting factors for topdressing are dry consistence and bedrock. The Mayqueen series was described at 102 sites in the survey area.

MAYQUEEN SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS				LABORATORY PHYSICAL					LABORATORY CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%				-%	DS/M	meq/l			-%	meq/100g		-%		
III	77	S	0-8	A	FS	S	88	1	11	LS		8.28	0.28	0.53	1.93	0.34	0.49	0.9			
		S	8-30	Bw	LS	SH	86	4	10	LS	31	8.29	0.28	1.26	2.23	0.50	1.08	1.0			
		S	30-46	Bt	LFS-SL	H	69	15	16	SL		8.13	0.38	2.64	1.58	0.39	2.96	1.8			
		S	48-80	2Bt	FSL	H-VH	88	11	21	SCL		8.17	0.57	4.08	1.85	0.37	4.04	1.9			
III	77R	S	80-80				68	11	21	SCL		8.02	0.31	2.19	1.39	0.28	2.41	2.0			
		S	80-100				72	7	21	SCL		8.04	0.30	2.17	1.54	0.27	2.28	2.1			
		S	100-120				81	2	17	SL		8.34	0.32	2.82	1.71	0.33	2.79	2.1			
		S	120-140				86	1	13	LS		8.58	0.48	4.82	1.02	0.21	8.15	2.7			
		S	140-160				48	11	43	SC	144	8.42	0.80	7.05	1.08	0.31	8.48	4.8			
		S	160-180				87	1	12	LS		8.67	0.42	4.97	1.28	0.80	4.87	0.5			
		U	180-210				80	4	18	SL		8.90	0.87	9.48	1.09	0.50	10.81	2.2			
		U	210-240				63	18	21	SCL		9.03	1.00	12.20	1.44	0.71	11.77	8.5			

MAYQUEEN SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	FIELD DETERMINATIONS				LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
		SUIT	DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				%				-%		DS/M	meq/l			-%	meq/100g		-%	
I	9	S	0-7	A	FS-LS	S	62	8	10	LS	32	8.19	0.28	0.52	2.37	0.36	0.45	0.9			
		S	7-36	C	LFS-FS	SH	66	5	9	LS	33	8.20	0.34	0.67	2.85	0.52	0.67	1.0			
		U	36-50	2Btk	SL-LFS	H-VH	72	14	14	SL	55	9.30	2.00	17.01	2.21	0.52	14.56	3.5	4.41	6.75	39.66
		U	50-60	2C	S	H-VH	66	0	14	LS		9.33	2.60	25.27	11.63	1.72	9.76	2.6			
I	13	U	37-67	2Ck	LS	H-VH	62	8	12	LS	34	8.96	1.00	10.80	0.99	0.23	13.57	2.3	2.15	6.92	25.87
I	35	S	0-4	A	LS	SH	62	11	7	LS		7.86	0.39	0.69	2.58	0.57	0.55	0.4			
		S	4-14	B	SL	SH	64	6	10	LS		7.84	0.30	0.74	1.88	0.46	0.68	0.3			
		S	14-26	Bt	SL	H	63	8	11	LS		8.06	0.36	0.96	2.49	0.71	0.76	3.5			
		S	26-46	C	SL	H	64	5	11	LS		8.42	0.52	3.89	2.78	0.89	2.72	3.7			
		U	46-61	2Btkb	SL	VH	62	5	13	SL		8.89	0.99	9.63	1.09	0.46	10.94	3.2			
I	47	S	0-6	A	SL	S	63	9	8	LS		8.16	0.39	1.03	2.75	0.56	0.80	1.3			
		S	60-22	B	SL	SH	69	3	8	S		8.30	0.32	1.52	1.89	0.36	1.49	0.6			
		S	22-42	Btk	SL	H	66	8	8	LS		8.10	0.41	1.65	2.89	0.56	1.29	1.5			
		S	42-56	2Btk	SL	H-VH	78	11	13	SL		6.45	0.56	4.61	0.88	0.44	5.67	1.1			
		U	56-68	2Ck	SL	VH	78	12	12	SL		8.72	0.75	7.35	1.44	0.32	7.64	3.3			
I	59	S	0-6	A	SL	SH	64	6	10	LS		7.72	0.56	1.08	4.18	0.75	0.69	1.1			
		S	6-18	Bt	SL	H	64	8	8	LS		6.07	0.32	0.90	2.03	0.47	0.80	1.4			
		U	16-37	Btk	SL	H	73	13	14	SL	35	6.63	1.00	11.60	1.05	0.31	14.07	6.4	3.22	7.94	35.38
II	5	S	0-6	A	S	L	91	1	8	S	31	8.32	0.31	0.62	3.03	0.50	0.47	0.6			
		S	6-24	AB	S	SH-H	69	3	8	S/LS	33	8.40	0.34	2.28	2.54	0.36	1.88	0.6			
		S	24-44	Btk	LS-SL	H-VH	72	10	18	SL		8.62	0.67	8.60	2.54	0.69	6.77	1.9			
		S	44-60	Bk	LS	H-VH	62	5	13	SL	36	8.11	5.20	41.60	7.28	4.32	17.27	1.9	3.01	7.16	21.09

MAYQUEEN SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				—%				—%		DS/M	—meq/l—				—%	—meq/100g—		
III	54	S	0-10	A	LS	S	84	4	12	LS		8.18	0.33	0.87	2.86	0.30	0.69	2.20			
		S	10-26	Bt1	SL	SH	74	10	18	SL		8.25	0.45	3.80	1.47	0.24	4.11	2.50			
		S	26-40	Bt2	LS	H-VH	75	8	17	SL		8.21	0.74	7.85	3.53	0.72	5.25	2.70			
		U	40-54	Bt3	LS	VH	74	8	18	SL		8.27	1.42	12.00	2.33	0.55	10.00	3.10			
III	54R	U	60-80				59	13	28	BCL	44	7.95	8.10	52.80	8.95	2.51	24.28	3.5	5.89	14.56	24.52
		U	80-96				55	23	22	SCL	49	8.30	3.15	32.90	3.74	0.75	21.84	12.2	4.85	11.09	29.22
III	56	S	0-6	A	S	S	87	3	10	SALS	29	7.75	5.80	1.28	4.84	0.89	0.78	2.2			
		S	6-20	BA	S	SH	84	3	13	SL		7.85	0.39	1.49	3.39	0.48	1.07	1.8			
		S	20-40	Bt	S	H-VH	81	4	15	SL		7.94	0.72	5.26	3.00	0.54	3.96	2.0			
		S	40-60	C	S	H	86	2	12	LS		8.42	0.60	8.60	4.70	0.83	5.27	1.7			
III	58	S	0-10	A	FS	S	84	3	13	LS		8.10	0.59	2.28	4.25	0.56	1.46	1.7			
		S	10-18	Bw	LFS	H	86	4	10	LS	28	8.28	0.54	5.50	3.04	0.51	4.13	1.5			
		U	18-36	Btk	FSL	EH	79	8	15	SL		8.42	1.80	17.00	8.06	1.17	7.91	2.2			
		U	36-52	C	S	VH	82	3	15	SL		8.10	5.70	62.10	4.40	2.30	22.93	1.5			
		U	52-60	2Ck	LS	EH	77	5	18	SL		7.90	8.80	66.40	8.42	4.41	28.53	1.5			
III	60	S	0-9	A	FS	S	90	2	8	S	31	8.15	0.53	2.28	3.88	0.57	1.56	1.3			
		S	9-15	Bw	S	SH	88	2	10	LS	30	8.30	0.57	4.78	1.92	0.43	4.41	1.3			
		S	15-30	Btk	LFS	H-VH	84	4	12	LS		8.75	1.35	18.20	4.87	0.85	11.18	2.3			
		U	30-45	Ck	S	VH	91	1	8	S	41	8.37	4.41	40.10	4.31	1.85	22.85	0.9	2.87	3.52	34.94
		U	45-60	C	S	VH	91	2	7	S	40	8.90	1.80	19.10	4.89	2.91	9.87	0.8			

MAYQUEEN SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS				LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.:	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				---	---	---		---		DS/M	---	---	---	---	---	---	---	---
III	87	S	0-3	A	FS	S	66	2	10	LS	25	8.16	0.36	0.70	2.99	0.31	0.54	1.9			
		S	3-9	Bw	FS	SH	87	3	10	LS	27	8.27	0.40	1.93	2.05	0.22	1.81	1.8			
		S	9-21	Bwk	FSL-LFS	H-VH	83	4	13	LS/SL		8.73	0.70	6.42	2.45	0.30	5.47	2.2			
		U	21-45	2C1	SL-LS	EH	68	11	21	SCL	57	6.25	5.00	46.66	6.88	1.88	22.17	5.9	5.05	17.60	13.56
		U	45-60	2C2	FS-FLS	EH	86	4	10	LS	38	6.55	2.30	22.82	2.43	0.56	18.66	1.7	1.94	5.40	19.44
III	69	S	0-6	A/Bw	FS	S-SH	84	6	10	LS	26	8.07	0.74	4.63	2.83	0.37	3.66	1.8			
		S	6-18	Bwk	FS	H-VH	76	10	14	SL		8.35	0.90	7.96	0.81	0.11	11.59	3.8			
		U	18-34	C	FS-LFS	VH	82	5	13	SL	46	8.03	8.00	70.20	12.11	3.86	24.84	2.2	5.00	9.15	19.34
		U	34-60	2C	S-GS	VH	85	4	11	LS	41	6.18	5.60	51.90	7.12	2.60	23.54	3.3	3.36	7.60	18.18
III	71	S	0-5	A	FS-LFS	SH	83	7	10	LS	26	8.13	0.44	1.22	2.57	0.31	1.02	1.8			
		S	5-13	Bw	LS	H	84	5	11	LS		8.22	0.51	3.66	1.57	0.22	3.57	1.8			
		S	13-26	Bbk	SL	H-VH	70	13	17	SL		8.24	1.80	14.31	2.43	0.43	11.97	3.1			
		S	26-42	Ch	LS	H-VH	81	7	12	SL	37	7.92	6.20	50.60	12.96	5.56	16.43	1.6	2.66	7.05	11.06
		S	42-60	C	S	H-VH	81	2	7	S	37	8.22	3.00	25.69	4.70	1.68	14.16	0.8	1.42	3.70	12.70
III	72	S	0-8	A	FS-LFS	S	87	4	9	LS	31	8.06	0.44	0.91	2.82	0.32	0.73	1.8			
		S	8-28	Bt	FS-LFS	H	84	4	12	LS		8.10	0.49	3.35	1.64	0.20	3.49	2.0			
		S	28-44	Ch	FS-LFS	H-VH	89	3	8	SALS	29	8.75	0.74	5.97	0.68	0.10	9.86	1.9			
		U	44-60	C			90	2	8	S	42	8.97	1.50	12.26	2.32	0.78	9.85	1.0			
III	79	S	0-8	A	S	S	81	6	13	LS		8.06	0.52	1.20	2.42	0.32	1.03	1.2			
		S	8-17	Bw	S	SH	86	4	10	LS	30	8.10	0.33	1.44	1.90	0.23	1.40	1.2			
		S	17-26	Bt	LS	H	76	9	15	SL		8.25	0.47	4.13	0.72	0.09	6.45	1.6			
		S	26-43	2Bt	SL-SCL	H-VH	75	5	20	SCL/SL		8.47	0.66	7.46	0.73	0.10	11.58	3.2			
		S	43-60	2Bt	S-SCL	H-VH	53	16	31	SCL	60	7.89	4.90	37.74	13.15	2.48	13.50	2.0	4.87	23.70	11.01

MAYQUEEN SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			ORY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL							
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA
			-in-				-%			-%	DSM		-meq-			-%	-meq/100g-	-%	
III	256	S	0-65	Bt	SL	SH-H	75	7	18	SL		8.18	1.02	9.70	2.35	0.30	8.43	3.2	
IV	197	S	0-10	A	LS-SL	SH	84	5	11	LS		8.07	0.33	0.44	2.88	0.42	0.34	2.0	
		S	10-20	Bt	SL	H	78	6	16	SL		7.98	0.35	0.93	2.62	0.48	0.75	4.3	
		S	20-50	C	LS-SL	SH	86	1	13	LS		8.11	0.84	8.01	2.18	0.84	4.91	2.0	
IV	487	S	0-6	A	LS	SH	86	3	11	LS	28	7.78	0.40	0.22	2.93	0.53	0.17	1.0	
		S	8-20	Bt	LS	H	87	3	10	LS	30	7.67	0.33	0.22	2.39	0.56	0.18	1.8	
		S	20-35	Btk	SL	H-VH	85	3	12	LS	34	7.85	0.30	0.62	1.71	0.53	0.59	3.1	
		S	35-55	Bk	LS	H-VH	88	3	9	LS	31	7.97	0.41	1.70	1.53	0.82	1.57	2.4	
IV	561	S	0-6	A	LS	SH													

Monierco Series

The soils of the Monierco series are classified as Typic Haplargids, loamy, mixed, mesic, shallow. These shallow, well drained soils are on knolls, mesas, and plateaus. The soils formed in moderately fine textured eolian and alluvial material overlying sandstone and shale.

Typifying pedon: Monierco sandy loam, 0 to 5 percent slope. Location is Area III, site 25.

- A- 0 to 3 inches; light yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist; weak fine granular structure; slightly hard, nonsticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bt- 3 to 9 inches; lightly yellowish brown (10 YR 6/4) sandy loam/sandy clay loam, yellowish brown (10 YR 5/4) moist; moderate medium subangular blocky structure hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Btk- 9 to 19 inches; very pale brown (10 YR 7/4) clay loam, light yellowish brown (10 YR 6/4) moist; weak prismatic parting to moderate fine subangular blocky structure; hard, slightly sticky and plastic; disseminated and soft masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

R- 19 inches; sandstone.

Thickness of the solum and depth to paralithic contact or bedrock ranges from 10 to 20 inches. The soil is mildly to strongly alkaline and the control section ranges from 18 to 35 percent clay and averages a sandy clay loam. The A horizon has hue of 7.5 YR to 10 YR and ranges from loamy sand to sandy clay loam. The B horizon has hue of 5 YR to 10 YR. It has sandy loam sandy clay loam or clay loam textures.

The range of topdressing depth is 0 to 20 inches. The limiting factors for topdressing are bedrock, carbonates and dry consistence. The Monierco series was described at 124 sites in the survey area.

MONIERCO SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%					DS/M meq/-% meq/100g-%									
III	25.00	S	0-3	A	SL	SH-H	76.00	10.00	14.00	SL		8.04	0.46	0.62	3.81	0.54	0.43	1.70			
		S	3-9	Bt	FSL	H	83.00	17.00	20.00	SL/SCL		7.81	0.33	0.80	2.85	0.55	0.61	8.40			
		S	9-19	Btk	FSL	H	34.00	36.00	30.00	CL		7.93	0.50	2.10	2.80	0.84	1.56	22.00			

MONIERCO SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%					DS/M meq/-% meq/100g-%									
III	27.00	S	0-6	Bt	SL	SH	62.00	20.00	18.00	SL		7.97	0.53	1.72	3.23	0.57	1.25	4.90			
		U	6-16	Crk	SL-SCL	H	62.00	18.00	20.00	SL/SCL		7.95	0.36	0.96	2.52	0.38	0.60	12.80			

Nakai Series

The soils of the Nakai series are classified as Typic Calciorthids, coarse-loamy, mixed mesic. These deep, well drained, moderately rapidly permeable soils are on terraces, and fans that formed in mixed alluvium and eolian deposited derived from sandstone and shale.

Typical pedon: Nakai loamy fine sand, 0 - 5 percent slope. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1987.

- A- 0 to 5 inches; reddish yellow (7.5 YR 6/6) loamy fine sand, strong brown (7.5 YR 5/6) moist; weak thick platy structure parting to grain; soft, slightly calcareous; moderately alkaline; clear wavy boundary.
- Bw- 5 to 21 inches; yellowish red (5 YR 6/6) loamy fine sandy, reddish yellow (5 YR 5/6) moist; massive; soft, slightly calcareous; strongly alkaline; clear wavy boundary.
- Bk1- 21 to 26 inches; yellowish red (5 YR 6/6) fine sandy loam, reddish yellow (5 YR 5/6) moist; massive; slightly hard, slightly plastic; slightly calcareous; strongly alkaline; clear wavy boundary.

- Bk2- 26 to 34 inches; pinkish white (7.5 YR 8/2) very fine sandy loam, pinkish gray (7.5 YR 6/2) moist; massive; hard, slightly plastic; strongly calcareous; strongly alkaline; clear wavy boundary.
- C3- 34 to 60 inches; pink (7.5 YR 7.4) loamy fine sand, brown (7.5 YR 5/4) moist; massive; soft, moderately calcareous; moderately alkaline.

The range of topdressing depth is 4 to 22 inches. The limiting factors are bedrock, carbonates and dry consistence. The Nakai series was described at 10 sites in the survey area. Laboratory samples were not collected for this series because of its limited extent in the Navajo Mine.

Patel Series

The soils of the Patel series are classified as Typic Natrargids, fine, mixed, mesic. These moderately deep, well drained, slowly permeable, sodic soils are on mesas, and upland valley bottoms. The soils formed in alluvium and weathered bedrock derived from shale.

Typifying pedon: Patel loam, 0 to 3 percent slope. Pedon description taken from Shiprock Survey Soil Conservation Service, 1987.

- E- 0 to 1 inch; light brown (7.5 YR 6/4) loam, brown (7.5 YR 4/4) moist; moderate very thick platy structure; soft, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Btn- 1 to 8 inches; brown (7.5 YR 5/4) clay, brown (7.5 YR 4/4) moist; moderate medium prismatic structure parting to moderate fine angular block; hard, sticky and plastic; common thin clay films on faces of peds and in pores; strongly effervescent; strongly alkaline; clear smooth boundary.

Btkn- 8 to 14 inches; yellowish brown (10 YR 5/4) silty clay loam, dark yellowish brown (10 YR 4/4) moist; strong medium prismatic structure; hard, sticky and plastic; few thin clay films on faces of peds; secondary gypsum segregated in very few fine irregularly shaped accumulations on faces of peds; strongly effervescent, secondary calcium carbonates segregated in few fine irregularly shaped accumulations on faces of peds; strongly alkaline; clear wavy boundary.

Btky- 14 to 37 inches; yellowish brown (10 YR 5/4) with grayish brown (10 YR 5/2) silty clay loam, dark yellowish brown (10 YR 4/4) with dark grayish brown (10 YR 4/2) moist; moderate medium prismatic structure parting to moderate coarse angular blocky; hard, sticky and plastic; very few thin clay films on faces of peds and in pores; secondary gypsum segregated in few fine irregularly shaped accumulations on faces of peds; strongly effervescent, secondary calcium carbonates segregated in few medium irregularly shaped accumulations on faces of peds; strongly alkaline; clear wavy boundary.

Cr- 37 to 60 inches; thinly interbedded shale.

Thickness of solum and depth to paralithic contact ranges from 20 to 40 inches. The soils range from 35 to 45 percent clay and have SA values greater than 15. This series was not sampled except at site 761 in Area IV where a sandy surface was collected.

The range of topdressing depth is 0 to 20 inches. Suitable material is limited to the sandy surfaces. The limiting factors for topdressing are SA and texture. The Patel series was described at 30 sites in the survey area.

PATEL SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL								
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC
			in			%						DS/M	meq/l			%	meq/100g			
SAMPLE NOT TAKEN																				

PATEL SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL							
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA
			in			%						DS/M	meq/l			%	meq/100g		
IV	781.00	S	0-8	A	S	SH	79.90	8.20	11.90	BL	30.68	7.84	0.50	6.08	1.58	0.28	6.34		

Persayo Series

The soils in the Persayo series are classified as Typic Torriorthents, loamy, mixed calcareous, mesic, shallow. These shallow, well drained soils are on hill and breaks. The soil formed in residium derived from weathered shale.

Typifying pedon: Persayo sandy clay loam,) to 8 percent slopes. Location is Area IV, site 92.

A- 0 to 4 inches; pale brown (10 YR 6/3) sandy loam/sandy clay loam, yellowish brown (10 YR 5/4) moist; weak medium subangular blocky structure; hard, slightly sticky and slightly plastic; disseminated calcium carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.

Cr- 4 to 40 inches; interbedded sandstone and shale.

Sedimentary bedrock (sandstone, siltstone and shale) is at a depth of 10 to 20 inches and paralithic contact may be within 4 inches of the surfaces. The A horizon has a hue of 10 YR to 5 Y and the texture ranges from sandy loam to clay loam. The C horizon is clay loam or sandy clay loam and has a hue of 10 YR to 2.5 Y.

The range of topdressing depth is 0 to 11 inches. The limiting factors for topdressing are bedrock and dry consistence. The Persayo series was described at 21 sites in the survey area.

PERSAYO SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in			%					DS/M			meq/l			%		meq/100g		%
IV	92	S	0-4	A	SL	H	66	13	21	SCL		7.93	0.69	1.84	4.32	0.62	1.17	6.5			

PERSAYO SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in			%					DS/M			meq/l			%		meq/100g		%
IV	119	S	0-3	A	SCL	SH	65	13	22	SCL		8.01	0.44	1.08	2.88	0.50	0.83	9.3			
IV	132	S	0-4	A/C	SCL	SH	72	10	18	SL		8.08	0.69	4.77	2.88	0.49	3.87	5.2			
IV	138	S	0-3	A	SCL	SH-H	57	18	27	SCL		8.08	1.20	8.94	2.83	0.53	6.90	13.1			

Razito Series

The soils in the Razito series are classified as Typic Torripsamments, mixed mesic. These deep somewhat excessively drained soils are on mesas and plateaus. The soils formed in eolian material.

Typifying pedon: Razito loam sand, 0 to 5 percent slope. Location is Area II, site 69.

A- 0 to 6 inches; light yellowish brown (10 YR 6/4) loamy sand, yellowish brown (10 YR 5/4) moist; very weak subangular blocky structure; slightly hard, nonsticky and nonplastic; noneffervescent; moderately alkaline; clear smooth boundary.

C- 6 to 98 inches; light yellowish brown (10 YR 6/4) loamy sand, yellowish brown (10 YR 5/4) moist/massive; slightly hard, nonsticky and nonplastic; noneffervescent; moderately alkaline.

The control section averages loamy sand. The A horizon has a hue of 10 YR or 7.5 YR and is loamy sand or sand. The C horizon has a hue of 10 YR or 7.5 YR and is sand or loamy sand.

The range of topdressing depth is 0 to 98 inches. The limiting factors for topdressing are bedrock and dry consistence. The Razito series was described at 141 sites in the survey area.

RAZITO SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%-					DS/M meq/l -% -meq/100g -% -									
II	89	S	0-6	A	LS	SH	88	2	12	LS		8.09	0.24	0.44	1.78	0.39	0.42	0.6			
		S	6-98	C	LS	SH	85	2	13	SL/LS		8.29	0.47	2.70	1.89	0.42	2.83	1.2			

RAZITO SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%-					DS/M meq/l -% -meq/100g -% -									
I	4	S	0-6	A	S	S-SH	91	1	8	S	32	8.09	0.39	0.75	3.47	28.00	0.20	0.5			
		S	6-30	C1	S	H	87	3	10	LS	29	8.18	0.30	1.01	7.28	1.37	0.49	0.7			
		S	30-48	C2	S	H	90	2	8	S	27	8.50	0.47	4.09	0.83	0.17	5.78	1.0			
		S	48-60	2Ck	S	H-SH	86	3	11	LS		8.02	4.80	36.01	14.24	4.18	11.87	2.7			
I	7	S	0-7	A	FS	S	88	2	10	LS	34	8.21	0.30	0.60	2.21	0.31	0.53	0.6			
		S	7-22	Bw	FS	SH-H	87	4	9	LS	36	8.18	0.33	0.67	2.54	0.42	0.55	0.6			
		S	22-42	Bwk	FS-LFS	H	84	4	12	LS		8.17	0.47	1.96	2.89	0.08	1.81	1.7			
		S	42-60	2Bwk	FS-LFS	H	85	4	11	LS		8.45	0.60	5.38	3.23	0.58	3.90	0.6			
I	11	S	0-7	A	LFS	S	92	2	8	S	33	8.03	0.56	0.55	2.93	0.82	0.40	0.4			
		S	7-20	AB	LS	SH	91	1	6	S	33	8.15	0.28	0.58	2.32	0.64	0.46	1.1			
		S	20-33	Bw	LS	H	80	10	10	LS/SL	33	7.87	0.48	0.78	4.51	1.28	0.44	7.0			
		U	33-48	2Bk	SL	VH	60	25	15	SL		8.32	0.88	1.85	2.85	3.41	1.08	31.5			

RAZITO SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS				LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%			-%	DS/M			-meq/100g-			-%				
I	12	S	0-5	A	LFS	S	86	8	8	LS	31	8.00	0.42	0.77	3.83	0.87	0.52	0.4			
		S	5-18	Bw	LFS	SH	90	3	7	S	32	8.25	0.34	1.10	8.43	2.70	0.51	0.8			
		S	18-28	Bk	LFS	H-VH	88	4	8	SLS	34	8.93	1.00	11.00	8.86	6.04	4.37	0.3			
		U	28-34	2Btk	SCL	VH	57	9	34	SCL		9.10	2.97	29.30	1.10	0.47	29.70	9.8			
		U	34-48	2Ck1	SL-LS	VH	72	9	19	SL		8.80	4.03	36.10	1.13	1.08	34.34	5.2			
		U	48-60	3Ck2	SCL	VH	57	18	27	SCL		8.37	6.83	86.00	4.78	4.60	30.51	7.5			
I	12R	U	60-80				89	11	20	SCL/SL		8.83	4.90	48.40	3.80	2.82	28.80	5.2			
		U	80-100				49	17	34	SCL		9.51	1.80	19.10	0.77	0.38	25.41	8.1			
		U	100-120				52	24	28	SCL		9.37	1.89	17.50	0.31	0.20	34.86	8.1			
I	21	S	0-5	A	LS	S	85	7	8	LS		8.15	0.33	0.74	1.89	0.38	0.89	1.0			
		S	5-12	B	SL	S	83	8	11	LS		8.13	0.30	1.07	1.95	0.37	0.99	2.4			
		U	12-23	Cr	SL	SH-H	58	21	21	SCL		7.89	0.39	1.32	2.40	0.75	1.05	21.4			
III	68	S	0-9	A	LFS	SH	82	11	7	LS	29	8.14	0.93	6.21	4.62	0.63	3.83	1.7			
		S	9-22	Bwtk	LFS	H-VH	82	9	9	LS	35	8.43	1.52	14.30	2.68	0.91	10.88	1.5			
		U	22-38	C	LFS-FSL	VH	77	9	14	SL	119	8.56	4.02	34.90	2.34	1.58	24.99	4.7	8.40	11.92	35.85
		U	38-60	C	SCL-SL-S	EH	59	14	27	SCL	187	8.80	1.87	17.00	0.95	0.49	20.07	2.7	11.25	21.83	38.88
III	68R	U	60-80				38	28	36	CL	175	8.85	1.47	16.10	0.89	0.42	19.89	3.4	10.01	20.44	35.18
		U	80-100				38	25	37	CL	131	8.82	1.20	11.80	0.19	0.18	28.97	2.8			
		U	100-120				48	23	31	SCL		8.89	2.10	11.50	0.82	0.44	28.35	3.3			
		U	120-144				57	18	25	SCL	85	8.77	1.62	17.80	1.04	0.40	20.74	5.5	8.04	12.04	40.70
		U	144-168				88	12	20	SCL/SL	56	8.89	1.70	17.20	1.27	0.39	18.88	9.5	4.47	9.87	38.30

RAZITO SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				---	---	---	---	---	---	DSM	---	---	---	---	---	---	---	---
III	70	S	0-8	Bk1	FS-LFS	H-VH	87	7	8	SL	36	8.71	0.93	8.60	4.09	1.12	5.33	0.9			
		S	8-25	Bk2	FS	H-VH	86	6	8	SL	30	8.15	0.64	3.33	2.92	0.51	2.54	0.6			
		U	25-43	C1	FS-LFS	VH-EH	87	8	5	SL	48	8.42	3.40	29.40	2.77	1.63	19.82	1.0	3.01	3.73	42.90
		U	43-80	2C2	FS-LFS	VH-EH	57	15	28	SCL	209	8.50	2.19	20.60	1.49	0.66	18.93	1.4	9.84	22.99	24.48
III	70R	U	80-78				24	15	61	C	312	8.89	1.40	15.00	0.71	0.45	19.70	2.1			
		S	78-102				58	15	29	SCL	108	8.70	1.39	13.70	1.39	0.65	13.57	2.6	5.50	16.50	24.48
		S	102-120				46	23	31	SCL		8.55	1.38	14.60	1.15	0.85	14.60	2.6			
		S	120-150				43	28	31	CL	114	8.44	1.62	16.80	1.59	0.74	15.56	2.6	6.05	18.30	22.48
		U	150-180				48	22	32	SCL	78	7.94	5.10	45.40	7.24	6.40	18.24	2.9	5.75	17.15	13.41
		S	180-210				53	18	29	SCL		6.00	4.00	35.40		4.81	15.82	2.6			
		S	210-240				68	13	19	SL	44	8.17	2.55	26.20	3.12	1.98	18.41	3.7	3.60	10.08	24.31
III	74	S	0-8	A	FS-LFS	S	90	1	9	SLS	29	8.06	0.25	0.70	2.61	0.23	0.59	2.0			
		S	8-18	Bw	FS-LFS	H	86	4	10	LS	29	8.01	0.44	1.63	2.45	0.26	1.57	2.3			
		S	18-33	Bwk	FS-LFS	H-VH	90	1	9	SLS	27	8.56	0.75	5.93	1.00	0.13	7.89	2.2			
		U	33-45	2C1	FS-LFS	VH	60	18	22	SCL		8.75	1.70	15.02	0.61	0.27	20.44	5.1			
		U	45-60	2C2	FS-LFS	VH	63	21	16	SL		8.07	5.40	46.40	9.12	4.96	18.24	2.7			
III	76	S	0-8	A1/C	S	93	1	6	S	31	8.29	0.25	0.70	4.39	1.20	0.42	0.6				
		S	8-26	C1	S	92	1	7	S	31	8.25	0.28	0.62	3.45	0.57	0.44	0.9				
		S	26-44	C2	S	91	1	8	S	32	8.31	0.42	2.07	3.52	0.63	1.44	0.8				
		S	44-60	C3	S	91	1	6	S	30	8.27	0.59	3.20	6.38	0.90	1.88	0.8				
III	174	S	0-10	A	LS	S	88	4	8	LS		8.18	0.32	1.17	3.02	0.37	0.90	0.6			
		S	10-53	C1	LS	H-VH	82	5	13	SL	34	8.74	0.97	10.20	0.87	0.22	13.82	1.8	2.87	7.73	32.60
		S	53-75	C2	SL	H-VH	87	3	10	LS		8.36	0.39	2.94	1.15	0.23	3.54	1.3			

RAZITO SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY PHYSICAL					LABORATORY CHEMICAL								
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC
			ft				%				%	DS/M	meq/l						meq/100g	%
IV	834	U	24-35	Bwb	S	EH	64	3	13	LS/SL	33	6.50	0.70	7.24	0.81	0.16	11.52			
IV	714	S	0-6	A	S	SH	64	6	10	LS	31	7.67	0.46	0.64	2.91	0.56	0.48	3.2		
		U	8-35	C1	S	VH	82	7	11	LS/SL	30	7.95	0.49	3.83	0.65	0.23	5.21	2.4		
EQ-11/12	8	S	0-6	A	FSL	SH	72	12	17	SL	39	7.36	0.56	1.08	3.14	0.55	0.80	1.5		
		S	8-30	C1	LS	SH	80	9	11	LS/SL	35	7.76	0.62	2.81	2.22	0.41	2.45	1.1		
		S	30-55	C2	S	SH	89	4	7	S	35	7.68	4.40	25.13	24.17	5.91	6.48	1.1		

Redlands Variant Series

The soils of the Redlands Variant series are classified as Typic Haplargids, fine-loamy mixed, mesic. These deep, well drained soils are on terraces, mesas and plateaus. The soils formed in alluvium derived from sandstone and shale.

Typifying pedon: Redlands Variant sandy loam, 0 to 3 percent slopes. Location is Area III, site 6.

- A- 0 to 5 inches; light yellowish brown (10 YR 6/4) loamy sand/sandy loam, yellowish brown (10 YR 5/4) moist; moderate medium granular structure; slightly hard, nonsticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bt- 5 to 17 inches; light yellowish brown (10 YR 6/4) sandy loam/sandy clay loam, yellowish brown (10 YR 5/4) moist; moderate coarse prismatic structure; hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Btk- 17 to 30 inches; yellowish brown (10 YR 5/6) sandy loam, yellowish brown (10 YR 5/4) moist; moderate very coarse prismatic structure; hard to very hard, slightly sticky and slightly plastic; calcium carbonate nodules and soft masses; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk- 30 to 50 inches; very pale brown (10 YR 7/4) sandy loam, light yellowish brown (10 YR 6/4) moist; weak medium subangular blocky structure; hard, slightly sticky and slightly plastic; soft masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

2C- 50 to 60 inches; light yellowish brown (10 YR 6/4) loamy sand, yellowish brown (10 YR 5/4) moist; massive; hard, nonsticky and nonplastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline.

The solum is 20 to 40 inches thick and depth to secondary calcium carbonate accumulation ranges from 15 to 30 inches. The calcium carbonate equivalent between the B and C may be 5 percent but the content is less than 15 percent and thus does not qualify as a calcic horizon in a fine-loamy control section. Redlands Variant is used to describe soils similar to Redlands series that have hues of the solum ranging from 5 YR to 10 YR. The clay content of the control section ranges from 18 to 27 percent clay.

The range of topdressing depth is 4 to 87 inches. The limiting factors for topdressing are bedrock and dry consistence. The Redlands Variant series was described at 77 sites in the survey area.

REDLANDS VARIANT SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS				LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				---	---	---		---		DSM	---	---	---	---	---	---	---	---
III	8	S	0-5	A	LFS	SH	71	12	17	SL		8.05	0.80	5.74	3.13	0.49	4.28	0.3			
		S	5-17	Bt	SL	H	63	14	23	SCL		8.12	0.46	4.30	2.02	0.25	4.04	1.1			
		S	17-30	Btk	SL	H-VH	75	6	17	SL	29	8.17	0.81	9.56	1.01	0.18	12.37	11.7	1.91	8.93	18.25
		S	30-50	Bk	SL	H	82	3	15	SL		7.86	3.80	25.80	12.50	2.89	9.23	8.7			
		S	50-80	2C	LS-S	H	88	3	9	LS	27	8.09	2.30	17.20	8.70	1.74	8.37	3.4			
III	8R	S	80-80				60	8	12	SL		8.04	1.93	18.00	5.30	1.21	8.87	4.9			
		S	80-100				83	7	10	LS		8.02	0.14	11.20	5.57	1.14	6.11	2.6			
		S	100-120				84	6	10	LS		8.20	1.00	6.41	2.02	0.49	7.46	2.0			
		S	120-140				89	3	8	S/LS	26	6.12	1.31	10.30	2.87	0.89	7.72	1.1			
		S	140-160				90	4	6	S	27	8.17	1.18	9.19	2.92	0.67	6.86	1.6			
		S	160-180				89	3	8	S/LS	27	8.17	1.01	9.03	2.81	0.58	6.94	1.5			
		S	180-200				89	5	6	S	27	8.08	1.10	6.56	2.86	0.50	6.60	2.4			
		S	200-220				91	4	5	S	28	8.11	0.90	7.49	2.11	0.52	6.53	0.7			
		S	220-240				91	2	7	S	28	8.10	0.81	6.38	2.02	0.56	5.62	0.7			

REDLANDS VARIANT SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%					DS/M meq/100g									
III	5	S	0-3	A	LFS	S					SL/SCL		7.94	0.45	0.94	3.18	0.43	0.70	1.9		
		S	3-18	Bk1	SL	H					SCL		7.93	0.43	2.64	1.43	0.19	3.18	3.0		
		S	18-32	Bk	SL	H-VH					SL		8.18	0.72	5.83	1.21	0.21	6.92	3.5		
		S	32-44	Bk	SL	H					SL		8.16	1.40	10.47	2.52	0.40	6.67	10.7		
		S	44-60	2C	S	H					S/LS	26	6.30	1.30	9.41	1.89	0.48	6.64	3.2		
III	36	S	0-4	A	L	L	53	20	27	SCL		7.92	0.40	1.15	3.20	0.69	0.62	1.8			
		S	4-14	Bk	L-SCL	H	63	16	21	SCL		7.95	0.38	2.04	3.15	0.50	1.51	3.4			
		S	14-36	B1	CL	H-VH	61	16	23	SCL		7.93	1.38	9.56	5.54	1.41	5.13	5.0			
		U	36-48	C1	CL	SH-H	27	24	49	C	72	7.91	1.92	12.00	5.80	1.92	6.11	4.9			
		S	48-60	2C2	CL	SH-H	52	17	31	SCL		7.72	1.35	19.10	12.30	5.14	6.47	2.8			
III	45	S	0-5	A	SL	SH	73	7	20	SCL/SL		7.88	0.77	5.26	3.47	0.38	3.79	1.4			
		S	5-18	Bk1	SCL	H	68	10	22	SCL		6.04	0.63	7.65	2.12	0.27	7.00	2.7			
		S	16-23	Bk2	SCL	H-VH	78	8	16	SL		6.06	0.88	7.65	2.48	0.29	6.50	3.4			
		S	23-30	Bk	SL	H-VH	54	30	16	SL		7.97	1.50	12.00	5.31	0.41	7.10	5.3			
		S	30-40	Ck	LS	H	86	7	7	LS	29	6.00	1.70	14.30	4.72	0.50	6.86	3.2			
		S	40-60	C	LS	H	88	4	8	LS	27	6.08	1.55	14.30	2.61	0.45	11.19	1.5			
III	45R	S	60-90				86	5	9	LS	26	6.08	1.52	13.30	4.82	0.70	7.93	2.3			
		S	90-120				90	7	13	SL		7.64	3.65	23.20	12.20	3.72	6.22	1.4			
		S	120-150				90	3	7	S	31	6.43	1.10	11.40	2.13	0.58	9.79	1.0			
		S	150-180				91	3	6	S	28	6.39	1.10	12.20	2.67	0.44	9.78	1.3			
		S	180-210				85	7	6	LS	30	6.15	1.26	11.80	6.77	0.53	9.19	1.4			
		S	210-240				90	3	7	S	29	6.18	1.22	10.80	3.10	0.66	7.88	1.3			

REDLANDS VARIANT SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				---	---	---	---	---	---	DS/M	---	---	---	---	---	---	---	---
III	82	S	0-6	A	SL	SH	79	9	12	SL		7.75	0.72	1.83	5.40	0.71	1.05	2.1			
		S	6-14	Bt	SL	H-VH	78	7	17	SL		7.95	0.60	4.27	1.81	0.27	4.19	2.6			
		U	14-35	Btk	SL	VH-EH	72	6	20	SCL/SL		8.31	1.10	9.67	1.05	0.27	11.80	3.1			
		U	35-75	Bk	SL	VH	60	7	13	SL		7.79	5.30	41.25	14.82	5.22	13.03	2.2	3.02	6.42	38.01
III	341	S	0-3	A	FSL	SH	62	21	17	SL		8.03	0.47	2.02	2.37	0.40	1.72	2.3			
		S	3-19	Bt	SL-SCL	H-VH	62	16	22	SCL		8.08	0.42	3.44	1.08	0.15	4.39	3.4			
		S	19-29	Btk	SCL	H-VH	77	4	19	SL		8.13	0.87	7.44	0.99	0.20	8.85	3.0			
		S	29-50	Ck	SL	H	75	10	15	SL		8.08	2.10	15.70	4.67	1.36	8.90	8.6			
		S	50-67	C	SL	H	76	12	12	SL		8.08	1.60	12.10	3.60	1.15	7.85	3.4			
III	479	S	0-7	A	SL	SH	69	14	17	SL		7.78	0.76	2.24	5.98	0.74	1.22	1.5			
		S	7-15	Bt	SL	H	71	9	20	SCL		8.16	0.66	3.71	2.08	0.51	3.26	1.4			
		S	15-28	Btk	SCL	H-VH	51	24	25	SCL		8.33	0.67	6.02	0.64	0.21	9.23	2.4			
		S	28-47	Bk	SCL	H	72	11	17	SL		7.96	5.50	44.50	18.10	8.25	12.03	3.7			
		S	47-63	C	SL	H-VH	70	14	16	SL		7.99	4.85	35.90	15.70	7.28	10.59	3.2			
		U	63-79	2Ck	SL	VH-EH	71	9	20	SCL	38	6.15	3.00	24.40	5.95	2.26	12.03	6.3	2.99	10.90	16.90
IV	275	S	20-37	Btk	SCL	H-VH	69	11	20	SL/SCL			0.81	6.98	0.68	0.14	10.90				
IV	300	S	0-5	A	FSL	SH	77	13	10	SL	27	7.79	0.46	0.71	2.84	0.42	0.56	1.4			
		S	5-12	Bt1	SCL	SH-H	77	8	15	SL	32	7.76	0.35	1.08	1.89	0.34	1.02	2.7			
		S	12-22	Bt2	SCL	H-VH	66	11	23	SCL	36	8.09	0.42	1.10	2.07	0.78	0.92	3.8			
		U	22-33	Btk	SCL	VH	54	17	29	SCL	45	7.88	2.50	19.69	3.73	1.50	12.18	3.5			
		U	33-43	C	SL	VH	81	5	14	SL	31	7.89	3.30	23.17	7.68	3.05	8.91	1.8			

REDLANDS VARIANT SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				-%			-%		DSM	-meq-			-%		-meq/100g-		-%	
IV	391	S	0-6	A	FSL	H	73	13	14	SL	30	7.50	0.71	1.08	4.28	1.09	0.88	1.9			
		S	6-15	B11	SL	H-VH	89	12	19	SL	30	7.89	0.50	1.80	2.31	0.88	1.31	2.7			
		U	15-28	B12	SCL	EH	72	7	21	SCL	34	7.80	0.47	2.02	1.93	0.81	1.79	3.7			
		U	28-63	C	LS	VH	86	4	10	LS	32	7.82	1.00	5.72	3.10	1.24	3.88	2.6			
EQ-7/8	10	S	6-12	B1	SL	H	70	14	18	SL										2.4	
		S	12-24	Bk1	SCL	H	56	24	20	SCL/SL											11.8
EQ-7/8	26	S	0-5	A	LS	S	85	7	8	LS	32	7.73	0.54	1.03	2.68	0.70	0.79	1.1			
		S	4-12	B1	SL	H	79	9	12	SL	32	7.98	0.80	5.00	0.68	0.19	7.58	1.2			
		U	12-20	Bk	SL	VH	69	8	25	SCL	45	8.44	1.20	11.34	0.28	0.15	24.46	8.3			
		U	20-31	C	SL	VH-EH	72	8	20	SCL	75	8.33	4.00	36.80	1.80	1.82	27.35	3.3			
EQ-25	27	S	0-8	A	LS	S	87	5	8	LS	34	7.85	0.54	0.98	3.45	0.78	0.87	0.8			
		S	6-22	Bw	SL	SH	85	7	8	LS	36	7.82	0.41	1.28	2.22	0.43	1.11	0.8			
		S	22-32	B1	SCL	H	70	8	22	SCL	43	7.84	0.52	1.64	2.36	1.12	1.24	5.1			
		S	32-40	Bk	SCL	H-VH	68	11	21	SCL	47	7.88	0.75	3.01	2.68	1.78	2.02	7.0			

Shiprock Series

The soils in the Shiprock series are classified as Typic Haplargids, coarse-loamy, mixed mesic. These deep, well drained soils are on mesas and plateaus. The soils formed in sandy eolian alluvial material derived from sandstone and shale.

Typifying pedon: Shiprock loamy sand 0 to 8 percent slopes. Location is Area I, site 23.

- A- 0 to 6 inches; light yellowish brown (10 YR 6/4) loamy sand, dark yellowish brown (10 YR 4/4) moist; weak fine subangular blocky structure; soft, nonsticky and nonplastic; noneffervescent; moderately alkaline; clear smooth boundary.
- Bw- 6 to 16 inches; light yellowish brown (10 YR 6/4) loamy sand, yellowish brown (10 YR 5/4) moist; weak moderate subangular blocky structure; soft, slightly sticky and slightly plastic; noneffervescent; moderately alkaline; abrupt smooth boundary.
- Bt- 16 to 28 inches; light yellowish brown (10 YR 6/4) sandy loam, yellowish brown (10 YR 5/4) moist; slightly hard, slightly sticky and slightly plastic; thin continuous clay films; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Btk- 28 to 49 inches; strong brown (7.5 Yr 4/6) sandy loam, strong brown (7.5 YR 4/6) moist; moderate medium prismatic parting to strong medium subangular blocky structure; hard to very hard, sticky and plastic; thin continuous clay films; disseminated and filaments of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

C- 49 to 79 inches; light yellowish brown (10 YR 6/4) sandy loam, light yellowish brown (10 YR 6/4) moist; massive; very hard, slightly sticky and slightly plastic; disseminated calcium carbonate, strongly effervescent; moderately alkaline.

The solum is 10 to 50 inches thick. The A horizon is sandy loam of loamy sand. It has a hue of 7.5 YR or 10 YR. The Bt horizon is sandy loam. It has hue of 5 YR to 10 YR.

The range of topdressing depth is 4 to 83 inches. The limiting factors for topdressing are bedrock and dry consistence. The Shiprock series was described at 173 sites in the survey area.

SHIPROCK SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					SAT	LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	pH		E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			-in-				-%			-%	DS/M	-meq/			-%	-meq/100g-		-%				
I	23	S	0-6	A	LS	S	85	5	10	LS		8.09	0.40	0.85	2.30	0.58	0.71	0.5				
		S	6-18	Bw	SL	S	81	11	8	LS		8.08	0.38	1.33	2.87	0.55	1.05	0.5				
		S	18-28	Bt	SL	SH	71	15	14	SL		8.09	0.41	1.82	1.86	0.73	1.86	1.3				
		S	28-49	Btk	SCL	H-VH	58	24	20	SCL/SL		8.24	0.87	5.87	0.78	0.58	8.93	1.8				
		U	49-79	C	SL	VH	78	9	15	SL	31	8.48	1.10	10.80	0.98	0.57	12.35	4.8	2.03	8.98	18.97	

SHIPROCK SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					SAT	LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	pH		E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			-in-				-%			-%	DS/M	-meq/			-%	-meq/100g-		-%				
I	6	S	0-5	A	LFS	L	78	7	15	SL		8.08	0.58	0.94	4.59	0.49	0.58	1.3				
		S	5-13	AB	SL	SH	74	8	18	SL		8.12	0.36	1.10	2.59	0.43	0.90	1.3				
		S	13-23	BA	LFS	H	82	7	11	SL		8.42	0.56	5.28	1.03	0.18	8.77	0.9				
		U	23-45	Bt	FSL-LS	VH	80	9	11	SL	37	8.70	2.01	17.20	1.84	0.21	17.89	1.8	3.28	7.18	36.87	
		U	45-80	C	S	VH	88	2	10	LS	35	8.84	2.35	20.80	2.05	0.42	18.55	1.3	2.74	4.88	41.39	

SHIPROCK SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL										
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.:	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			in-				%				%		DS/M	meq/l				%	meq/100g			
I	6R	S	60-90				88	1	11	LS		7.89	3.70	27.10	11.70	3.31	9.89	0.4				
		S	90-120				92	1	7	S	32	7.95	3.30	24.90	10.40	3.81	9.41	0.8				
		U	120-150				92	1	7	S	36	8.20	3.95	39.30	3.91	3.04	21.08	0.0	2.38	3.29	29.48	
		U	150-180				85	4	11	LS		8.18		85.50	6.20	8.63	25.86	0.7				
		S	180-210				93	2	5	S	33	8.24	8.42	24.90	3.80	1.87	14.79	0.1	1.54	2.07	34.78	
		S	210-240				91	2	7	S	38	7.97	3.90	34.50	4.96	3.19	17.07	0.0	2.05	3.03	24.42	
I	99	S	0-4	A	SL	SH																
		S	4-13	Bt	SL	H-VH		74	8	20	SCL/SL		7.90	0.69	5.60	1.38	0.15	8.44	2.3			
I	133	S	0-10	A	SL	SH		86	3	11	LS		7.98	0.63	1.96	3.20	0.50	1.44	0.9			
		S	10-22	Btk	SCL	H-VH		81	5	14	SL	38	8.53	1.00	10.10	1.15	0.18	12.39	2.7	3.08	8.75	30.86
		U	22-79	C	SL	VH		75	5	20	SCL/SL		7.95	7.30	78.80	19.60	3.84	22.43	2.3			
II	7	S	0-6	A	LFS-FSL	S		75	9	16	SL		8.07	0.60	1.39	4.91	0.49	0.85	2.1			
		S	6-14	BA	SL	H		78	7	17	SL		8.24	0.52	3.78	1.89	0.20	3.89	2.1			
		S	14-36	Btk1	SL	H-VH		77	6	17	SL		8.06	3.59	23.90	8.17	2.95	10.14	2.2			
		S	36-48	Btk2	SCL-SL	H-VH		75	6	19	SL	40	7.91	5.58	44.00	10.30	7.00	14.96	3.4	3.14	11.12	12.41
		S	48-70	Bck	LFS-SL	H-VH		74	10	16	SL	35	7.94	5.18	38.20	12.50	7.43	12.10	4.0	2.82	8.14	15.72
		S	70-80	C	LFS-FS	H-VH		78	10	14	SL	33	7.87	4.93	35.90	7.98	7.87	12.75	2.0	2.40	7.82	15.60
II	35	S	0-4	A	SL	SH-H		74	9	17	SL		7.97	0.55	1.49	3.03	0.50	1.12	2.4			
		S	4-12	Bt	SL	H		75	8	17	SL		8.00	0.48	1.86	2.29	0.35	1.62	2.4			
		S	12-26	2Btk	SCL	H-VH		74	10	16	SL		8.21	0.83	7.19	0.86	0.21	9.83	2.6			
		U	26-33	3Btk	CL	VH		73	9	18	SL		8.26	2.30	21.70	1.87	0.60	19.53	4.7			

SHIPROCK SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			ft				%	%	%		%		DSM	meq/l	meq/l	meq/l		meq/100g	meq/100g	meq/100g	meq/100g
II	53	S	0-10	A	SL	SH-H	74	9	17	SL		8.03	0.56	1.51	3.09	0.56	1.11	1.8			
		S	10-25	Btk1	SCL	H-VH	71	11	18	SL		8.30	0.92	8.87	0.87	0.14	13.82	4.8			
		S	25-33	Btk2	SCL	H-VH	77	8	17	SL		8.57	1.30	12.80	0.89	0.24	17.03	3.3			
		S	33-47	C1	SL	H-VH	64	5	11	LS	33	8.13	3.30	29.30	4.82	2.27	15.56	0.5	3.90	8.21	47.16
		U	47-66	C2	SL	VH-EH	80	7	13	SL		7.80	4.80	40.60	19.20	7.91	11.03	0.3			
II	57	S	0-6	A	LS	SH	81	5	14	SL		8.15	0.33	0.88	2.28	0.25	0.59	2.1			
		S	6-15	Btk	LS	SH	83	8	11	SL		8.18	0.38	1.50	2.36	0.25	1.31	2.3			
		S	15-59	C	LS	SH	89	1	10	LS		7.72	2.70	9.53	20.40	3.79	2.74	0.4			
II	62	S	0-7	A	LS	SH	81	8	13	SL		7.92	0.34	0.38	2.44	0.42	0.30	1.6			
		S	7-15	Bw	SL	H-VH	82	4	14	SL		8.11	0.28	0.82	1.62	0.39	0.82	2.1			
		S	15-23	Btk	SL	H-VH	72	12	18	SL		8.12	0.30	0.75	2.17	0.43	0.66	4.7			
		S	23-44	C	LS	H-VH	83	5	12	LS		8.11	0.39	1.68	1.90	0.52	1.53	2.9			
		U	44-59	2Bkb	SCL-SL	H-VH	82	11	27	SCL		7.88	3.00	14.50	20.40	4.54	4.11	19.5			
		S	59-83	2Bkb	SL	H-VH	80	8	14	SL		7.99	3.45	20.10	15.40	8.58	8.08	4.1			
III	8	S	0-4	A	FSL	SH	72	9	19	SL		7.97	0.34	1.90	2.25	0.30	1.05	2.9			
		S	4-18	Btk	SL	H-VH	73	9	18	SL		8.09	0.50	4.28	1.14	0.19	5.25	3.3			
		S	18-34	Bw	SL	H-VH	81	8	13	SL		8.56	0.70	8.21	10.68	0.81	2.83	3.1			
		S	34-42	2Bk	SL	H-VH	78	10	12	SL	34	8.18	2.10	18.09	2.75	0.61	12.06	7.9	1.87	8.85	14.91
		S	42-60	2Ck	LFS	H-VH	79	7	14	SL	31	8.07	3.00	27.01	8.74	2.14	2.82	5.8	2.03	9.85	12.33
III	19	S	0-5	A	LFS	S	75	15	10	SL/SCL	24	8.02	0.39	0.59	1.38	0.52	0.81	1.4			
		S	5-18	Bk	SL	H	78	10	14	SL		7.92	0.34	0.92	0.91	0.46	1.11	4.1			
		S	18-36	Btk	SL	H-VH	78	10	12	SL		8.31	0.64	5.37	0.36	0.21	10.06	4.2			
		S	36-48	2Ck	S-LS	H	82	7	11	LS	25	8.40	1.30	10.41	0.60	0.36	15.03	4.6	1.12	8.80	12.64
		S	48-60	2C	S	SH	87	4	9	LS	27	8.11	2.90	24.28	4.58	1.31	14.17	3.5	1.10	12.00	3.87

SHIPROCK SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%				%		DS/M	meq/l				%	meq/100g		%
III	21	S	0-3	A	LFS	S	78	12	12	SL		8.00	0.50	0.88	4.04	0.65	0.57	1.3			
		S	3-12	Bw	FSL	H	72	12	18	SL		7.97	0.33	0.90	2.25	0.31	0.80	2.9			
		S	12-30	Bt	SL	H	80	8	12	SL		8.09	0.43	2.86	1.52	0.65	3.03	3.5			
		S	30-45	2C1	LFS	SH	79	9	12	SL		8.35	0.80	5.00	2.12	0.26	4.58	2.8			
		S	45-60	2C2	LFS	SH	72	15	13	SL		8.13	1.00	6.93	2.43	0.57	5.88	3.5			
III	23	S	0-4	A	FSL-LFS	S	71	14	15	SL		8.08	0.41	1.45	3.08	0.59	1.07	1.9			
		S	4-12	BA	SL	SH	73	12	15	SL		8.00	0.29	1.35	2.42	0.44	1.13	2.1			
		S	12-25	Bt1	SL	H	78	5	18	SL		8.20	0.48	5.23	2.11	0.41	4.68	1.2			
		S	25-42	Bt2	SL	H-VH	78	7	17	SL		8.14	1.00	10.30	1.56	0.38	10.46	2.8			
		S	42-60	2Bk	LFS-FS	H-VH	79	8	13	SL		7.92	2.62	21.50	7.26	2.04	9.97	7.1			
III	57	S	0-10	A	LS	SH	76	8	16	SL		8.44	0.54	4.48	1.48	0.29	4.78	2.4			
		S	10-22	Bt	SFS	H-VH	81	4	15	SL	34	8.79	1.35	12.21	1.22	0.22	14.39	1.9	2.51	7.75	0.27
		U	22-38	2C1	SL-SCL	VH	82	15	23	SCL		8.39	4.70	47.80	3.25	1.18	32.19	3.9			
		U	38-60	2C2	LFS-S	VH	74	11	15	SL	81	9.06	1.60	14.73	0.75	0.21	21.26	4.9	4.32	8.60	40.00
III	91	S	0-6	A	LS	S	81	7	12	SL		7.92	0.77	3.45	4.40	0.81	2.14	1.7			
		S	6-14	Bt	SL	SH	85	5	10	LS		8.13	0.70	5.71	1.38	0.20	6.42	2.5			
		S	14-20	Btk	SL	H-VH	74	8	18	SL	32	8.29	0.90	8.60	0.79	0.11	12.62	6.5	2.17	10.50	18.00
		S	20-34	Ck	SL	H-VH	83	8	11	LS	27	8.83	1.00	10.10	1.04	0.17	12.99	2.0	1.93	2.92	28.04
		U	34-51	2Bt	SL	EH	76	11	11	SL	29	8.73	1.50	15.30	0.95	0.23	19.92	2.3	2.44	5.71	35.03
III	127	S	0-6	A	SL	SH	78	9	13	SL		7.60	0.68	1.22	5.13	0.61	0.72	2.7			
		S	6-26	Bt	SL	H-VH	84	4	12	LS		8.19	0.76	5.92	1.56	0.23	8.26	3.2			
		S	26-33	C1	LS-SL	H															
		U	33-71	C2	LS-SL	VH-EH	90	2	8	S	28	8.92	0.97	9.06	0.46	0.16	18.27	2.3	1.90	4.56	36.18

SHIPROCK SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.:	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			ft				%	%	%		%		DSM	meq/l	meq/l	meq/l		meq/100g	meq/100g	meq/100g	
IV	84	S	0-8	A	SL	SH	79	11	10	SL		7.94	0.59	1.42	3.93	0.59	0.94	3.3			
		S	6-18	Bt	SL	SH	82	7	11	LS		8.00	0.59	2.01	3.64	0.74	1.36	2.7			
		S	18-28	Btk	SL	H	75	8	17	SL		8.12	0.54	3.17	2.20	0.57	2.89	1.9			
		S	28-35	C	SL	H	82	5	13	SL		8.25	0.53	3.60	1.81	0.44	3.56	1.7			
		S	35-45	2Bk	LS	H	82	4	14	SL		8.24	0.87	8.81	4.72	0.57	4.06	5.8			
		S	45-87	2C	LS	SH	90	1	9	S		8.35	0.89	7.21	2.31	0.62	5.98	1.5			
		S	87-79	2Ck	SL	H	77	8	15	SL		7.80	4.00	23.28	18.08	9.11	8.31	8.9			
IV	251	S	20-31	Btk	SL	H-VH	78	5	17	SL											
IV	261	S	6-20	Btk	SCL	H-VH	78	7	17	SL	31	7.86	0.40	2.28	1.06	0.14	2.94	4.8			
IV	288	S	31-45	Btk	SCL	H	75	9	16	SL											
IV	438	S	0-4	A	SCL	SH	79	11	10	SL	26	7.21	0.80	0.77	4.06	1.11	0.48	1.4			
		S	4-14	Bt1	SCL	H-VH	78	7	15	SL	28	7.83	0.44	2.22	1.43	0.37	2.34	1.9			
		U	14-43	Bt2	SCL-CL	EH	73	10	17	SL	32	7.90	1.10	9.15	1.70	0.71	8.34	2.0			
IV	439	U	20-41	Bt2	SCL	VH	78	7	15	SL			0.74	5.94	0.78	0.28	8.18				
IV	443	U	20-31	Btk	SCL	VH-EH	75	4	21	SCL	33	8.05	0.48	3.02	0.98	0.81	3.41	1.0			
IV	563	S	0-10	A	LS-S	SH	89	2	9	LS/S	26	7.86	0.31	0.37	2.13	0.35	0.33				
		U	10-22	Bt	SL	EH	80	4	16	SL	28	8.14	0.42	3.75	0.70	0.23	5.50				
IV	819	S	0-4	A	S	H-VH	89	2	9	LS/S	25	8.15	0.75	8.03	1.01	0.38	7.23				
		U	4-18	Bw	S	EH	88	2	10	LS	38	8.80	2.00	19.00	0.74	0.27	28.74				
		U	18-26	2Bt	S	EH	84	3	13	LS/SL	39	8.45	5.00	81.55	8.00	4.27	35.99				

Shiprock Variant Series

The soils in the Shiprock Variant series are classified as Typic Haplargids, coarse-loamy, mixed, mesic. These deep, well drained soils are mesas and plateaus. The soils formed in alluvium derived from sandstone and shale.

Typifying pedon: Shiprock Variant sandy loam, 0 to 3 percent slopes. Location is Area III, site 16.

- A- 0 to 4 inches; light yellowish brown (10 YR 6/4) loamy fine sand, yellowish brown (10 YR 5/4) moist; weak medium granular structure; soft, nonsticky and nonplastic; noneffervescent; moderately alkaline; clear smooth boundary.
- AB- 4 to 12 inches; light yellowish brown (10 YR 6/4) fine sandy loam, yellowish brown (10 YR 5/4) moist; weak medium subangular blocky structure; slightly hard, nonsticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bt- 12 to 20 inches; light yellowish brown (10 YR 6/4) fine sandy loam, yellowish brown (10 YR 5/4) moist; moderate medium subangular blocky structure; hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

- Btk- 20 to 33 inches; light brown (7.5 YR 6/4) fine sandy loam, brown (7.5 YR 5/4) moist; moderate medium subangular blocky and moderate prismatic structure; hard to very hard, slightly sticky and slightly plastic; disseminated calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- 2Bk- 33 to 40 inches; very pale brown (10 YR 7/3) sandy loam, very pale brown (10 YR 7.3) moist; weak medium subangular blocky structure; hard, slightly sticky and plastic; soft masses of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.
- 2C- 40 to 60 inches; very pale brown (10 YR 7/3) sand/loamy sand, pale brown (10 YR 6/3) moist; massive; hard, nonsticky and nonplastic; soft masses of calcium carbonate; violently effervescent.

The solum is 20 to 40 inches thick and depth of calcic horizon is 24 to 36 inches deep. The calcium carbonate equivalent of the calcic horizon range from 5 to 15 percent. Shiprock Variant is used to describe soils similar to Shiprock series that have a calcic horizon. The A horizon is loamy sand or sandy loam and has a hue of 10 YR or 7.5 YR. The Bt horizon is sandy loam and has a hue of 7.5 YR or 10 YR. The C horizon is sand to sandy loam and has a hue of 7.5 YR to 10 YR.

The range of topdressing depth is 14 to 80 inches. The limiting factors for topdressing are bedrock, carbonates and dry consistence. The Shiprock Variant series was described at 28 sites in the survey area.

SHIPROCK VARIANT SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL				SAT	LABORATORY-CHEMICAL								
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS		pH	E.C.	NA	CA	MG	SAR	CaCO ₃	NA	CEC
			in				%				-%	DS/M	meq/l			-%	meq/100g		-%	
III	16	S	0-4	A	LFS	S	81	8	11	LS/SL		8.02	0.28	0.48	2.48	0.63	0.38	0.9		
		S	4-12	AB	FSL	SH	75	12	13	SL		8.03	0.27	0.58	2.38	0.57	0.48	1.9		
		S	12-20	Bt	FSL	H	75	8	17	SL		8.05	0.27	1.06	3.54	0.64	0.73	2.4		
		S	20-33	Bk	FSL	H-VH	78	7	17	SL		8.21	0.42	3.04	1.85	0.53	2.79	2.6		
		S	33-40	2Bk	SL	H	75	6	19	SL		8.27	0.87	8.21	2.71	0.53	4.88	13.0		
		S	40-60	2C	S	H	64	5	11	LS		6.22	1.21	10.50	3.08	1.29	7.12	5.9		
III	16R	S	60-80				83	5	12	LS/SL		7.73	2.53	9.57	15.20	6.28	2.92	2.5		
		S	80-100				85	5	10	LS		6.30	0.43	2.61	2.54	0.67	2.06	3.7		
		S	100-120				84	9	7	LS	31	7.96	0.41	2.95	1.72	0.50	2.90	3.8		
		S	120-150				92	1	7	S	27	6.18	0.56	4.28	1.28	0.43	4.63	0.7		
		S	150-180				83	1	6	S	27	6.32	0.49	3.73	1.07	0.41	4.34	0.6		
		S	180-210				91	2	7	S	31	6.36	0.78	5.96	1.20	0.48	6.52	1.3		
		S	210-240				92	1	7	S	31	6.32	0.76	6.43	1.13	0.30	7.60	1.0		

SHIPROCK VARIANT SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			ft-				%				%		DS/M	meq/l				%	meq/100g		
I	8	S	0-5	A	FS-LFS	S	86	6	8	LS	30	8.07	0.39	0.58	3.07	0.81	0.42	0.4			
		S	5-9	BA	LFS	SH	86	4	10	LS	29	8.20	0.28	0.45	4.81	0.77	0.27	0.8			
		S	9-15	Btk	LFS-SL	H-SH	79	6	13	SL		8.11	0.30	0.58	5.38	0.59	0.34	4.8			
		S	15-20	Bk	SL	H	71	11	18	SL		8.11	0.30	0.67	5.74	0.80	0.37	13.6			
		S	20-36	Ck	LS	H-SH	72	14	14	SL		8.34	0.40	2.48	2.34	0.94	1.92	7.7			
		S	36-60	C	S	SH-H	89	5	6	S	34	8.78	0.60	5.28	1.52	1.03	4.66	0.6			
I	8R	S	60-80				88	3	9	LS	39	8.67	1.20	12.20	0.62	0.81	14.43	0.7	1.47	3.95	25.06
		S	80-100				87	3	10	LS	35	8.48	2.32	20.70	2.17	2.94	12.95	2.3	1.87	6.13	18.76
		S	100-120				73	11	16	SL	37	7.99	7.10	48.00	7.28	23.39	12.28	0.8	3.12	9.25	14.49
		S	120-150				88	3	9	LS	36	8.13	3.35	22.50	7.66	10.13	7.54	1.6			
		S	150-180				81	6	13	SL	41	8.21	2.60	21.00	3.13	2.83	12.16	2.5	1.72	10.00	8.60
		S	180-210				83	5	12	LS		8.13	1.65	13.60	2.48	2.42	8.89	0.9			
S	210-240				88	2	10	LS		8.09	2.00	15.20	3.33	3.04	8.52	0.4					
III	14	S	0-5	A	S-LS	S	86	5	9	LS	27	8.09	0.27	0.49	1.68	0.37	0.48	0.1			
		S	5-17	Bt	LS-SL	SH	85	6	9	LS	27	8.03	0.33	0.79	1.79	0.47	0.74	5.0			
		S	17-33	Btk	SL-SCL	H-VH	73	9	18	SL		8.00	0.38	1.30	1.48	0.70	1.25	5.4			
		S	33-44	Btk	LS-SL	H	82	4	14	SL		8.21	0.72	5.39	1.11	0.55	5.92	9.4			
		S	44-60	2C	S	SH	90	2	8	S	27	8.51	1.00	8.01	0.64	0.50	10.61	3.4			
III	17	S	0-4	A	LFS	S	77	12	11	SL		6.09	0.31	0.58	2.63	0.56	0.48	1.2			
		S	4-14	Bt	FSL	SH	73	10	17	SL		7.98	0.31	1.26	2.30	0.52	1.06	2.2			
		S	14-26	Btk	SL-SCL	H-VH	73	8	19	SL		8.07	0.43	3.63	1.24	0.44	3.96	3.1			
		S	26-42	Bk	S-LS	SH	83	8	11	LS		8.06	2.79	22.90	5.34	3.42	10.94	7.6			
		S	42-60	C	S	L	91	2	7	S	30	7.86	4.40	29.20	10.50	9.60	9.21	1.3			

SHIPROCK VARIANT SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS				LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			ft				%			-%	DS/M		meq/l			-%	meq/100g		-%		
III	22	S	0-4	A	FSL	SH	72	15	13	SL		7.98	0.36	1.11	2.41	0.50	0.92	1.5	2.79	11.66	17.41
		S	4-18	Bw	SL	H	78	11	13	SL		8.00	0.30	1.75	2.20	0.34	1.55	2.9			
		U	18-30	Bwk	SL	VH	78	7	15	SL		8.18	0.45	3.97	1.26	0.17	4.87	8.5			
		S	30-48	C1	LFS-FSL	H	82	7	11	LS		8.35	1.01	10.00	1.44	0.38	10.48	3.3			
		S	48-60	C2	SL-LFS	H	73	12	15	S	37	8.04	2.39	20.60	3.72	1.02	13.38	2.3			
III	22R	S	60-80				53	41	8	SL	48	7.77	4.99	33.20	13.70	5.94	10.59	3.1			
		S	80-100				61	34	5	SL	37	7.94	4.00	29.60	10.70	4.03	11.02	3.4			
		S	100-120				45	38	17	L		7.73	5.00	35.40	13.60	8.73	11.10	1.9			
		S	120-150				91	1	6	S	32	8.04	1.80	12.60	3.00	0.82	9.00	2.4			
		S	150-180				87	5	8	LS	33	8.08	1.81	14.40	3.90	1.22	9.00	1.4			
		S	180-192				48	18	36	SC	56	7.87	2.59	19.30	7.30	2.52	8.71	1.8			
		S	192-228				79	7	14	SL		7.82	2.01	18.50	5.07	1.71	8.96	0.8			
		S	228-240				91	2	7	S	30	7.99	1.60	12.50	3.20	1.14	8.48	1.1			
		IV	263	S	0-6	A	SL	SH	73	14	13	SL	29	7.59	0.60	1.04	3.39	0.68	0.73	2.5	
S	6-15			Bw	SL	SH-H	61	7	12	SL	31	7.87	0.39	1.60	1.43	0.32	1.71	4.3			
S	15-33			Btk	SL	H	74	11	15	SL	33	7.97	0.83	4.70	1.07	0.26	5.78	5.5			
U	33-47			Bk	SCL	VH	64	15	21	SCL	30	7.95	1.20	8.60	1.69	0.81	7.87	24.3			
IV	260	S	0-5	A	SL	SH	60	8	12	SL	28	7.85	0.38	0.78	2.05	0.34	0.70	4.9			
		S	5-17	Btk1	SCL	H-VH	74	9	17	SL	29	7.95	0.53	3.87	1.15	0.21	0.45	2.1			
		S	17-22	Btk2	SCL	H-VH	74	10	18	SL	29	8.13	0.81	5.21	0.84	0.18	7.37	8.7			
		U	22-31	Bk	SCL	VH	50	23	27	SCL	34	8.26	0.91	8.09	0.44	0.15	14.89	35.0			

SHIPROCK VARIANT SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%				%	DS/M	meq/l			%	meq/100g		%		
IV	301	S	0-5	A	FSL	SH	80	9	11	SL	29	7.66	0.49	1.16	2.81	0.48	0.92	3.8			
		S	5-14	Bt	SL	H-VH	78	10	14	SL	32	7.80	0.46	1.06	2.73	0.66	0.83	1.2			
		U	14-26	Btk	SCL	VH	76	9	15	SL	33	7.95	0.51	3.72	1.03	0.31	4.54	3.2			
		U	28-35	Bk	SCL	VH	85	14	21	SCL	31	8.22	0.50	1.78	2.65	0.34	1.44	25.5			
EQ-7/8	11	S	0-7	A	SL	SH	80	10	10	SL	29	7.49	0.66	1.08	2.59	0.96	0.81	2.9			
		S	7-22	Bw	SL	H	85	5	10	LS	31	7.62	0.39	0.93	2.06	0.56	0.81	3.3			
		S	22-34	Bt	SCL	H-VH	71	12	17	SL	37	7.96	0.36	1.59	1.02	0.45	1.85	2.2			
		S	34-43	Btk	SCL	H	71	14	15	SL	32	8.13	0.60	4.23	0.78	0.34	5.85	8.4			
		S	43-89	C	LS	S	90	4	8	S	32	7.92	1.80	11.96	4.91	2.21	6.34	2.2			
EQ-15	11	S	0-7	A	LS	SH	89	1	10	LS	28	7.69	0.39	0.74	2.52	0.30	0.62	2.4			
		S	7-15	Bt1	SL	SH	84	4	12	LS	30	7.86	0.29	0.74	1.78	0.32	0.72	3.0			
		S	15-28	Bt2	SL	H	68	3	11	LS	30	7.85	0.38	2.03	1.36	0.31	2.22	2.7			
		S	28-34	Bk	LS	H	66	16	16	SL	29	8.13	0.73	6.01	0.84	0.17	6.46	9.6			
		S	34-54	C	S	SH	65	5	10	LS	35	8.48	1.30	12.02	1.06	0.32	14.47	2.8			

Stumble Series

The soils in the Stumble series are classified as Typic Torripsamments, mixed, mesic. These deep, somewhat excessively drained soils are on sides of valleys and alluvial fans. The soils formed in coarse textured alluvium derived from sandstone and shale.

Typifying pedon: Stumble loamy sand, 0 to 8 percent slopes. Location is Area IV, site 48.

- A- 0 to 4 inches; light brownish gray (10 YR 6/2) loamy sand, grayish brown (10 YR 4/2) moist; single grained; slightly hard; moderately alkaline; clear smooth boundary.
- Bk1- 4 to 19 inches; light brownish gray (10 YR 6/2) loamy sand, dark brown (10 YR 4/3) moist; massive; slightly hard, moderately alkaline; clear smooth boundary.
- Bk2- 19 to 26 inches; light brownish gray (10 YR 6/2) loamy sand, dark brown (10 YR 4/3) moist; massive hard, strongly effervescent; moderately alkaline (pH 8.8); clear smooth boundary.
- Bk3- 26 to 46 inches, light brownish gray (10 YR 6/2) loamy sand, dark brown (10 YR 4/3) moist; massive; slightly hard, slightly effervescent; moderately alkaline.
- C- 46 to 83 inches, light brownish gray (10 YR 6/2) loamy sand, dark brown (10 YR 4/3) moist; massive; soft; slightly effervescent, moderately alkaline.

The A horizon is loamy sand, sandy loam. It has a hue of 2.5 Y or 10 YR. The C horizon is loamy sand or sand and may be gravelly. It has a hue of 10 YR or 2.5 Y.

The range of topdressing depth is 4 to 83 inches. The limiting factors for topdressing are bedrock and dry consistence. The Stumble series are described at 12 sites in the survey area.

STUMBLE SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DS/M meq/100g									
IV	48	S	0-4	A	LS	SH	77	11	12	SL		6.05	0.37	0.63	2.58	0.46	0.51	8.1			
		S	4-19	Bk1	LS	SH	80	8	12	SL		6.68	0.30	2.09	0.76	3.08	3.08	4.2			
		S	19-26	Bk2	LS	H	78	11	13	SL		6.60	0.63	5.79	2.85	4.58	4.58	7.4			
		S	26-46	Bk3-4	LS	SH	81	8	11	LS		6.63	1.90	18.40	1.57	17.50	17.50	2.9			

STUMBLE SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in-				%					DS/M meq/100g									
III	150	S	0-5	A	LS	SH															
		S	5-16	C1	SL	H	88	5	9	LS		8.23	0.37	1.27	2.06	0.23	1.19	2.6			
		S	16-20	C2	S	S															
		U	20-30	2C1	SL-SCL	VH	73	15	12	SL		8.32	0.70	5.30	0.79	0.21	7.50	2.0			
		U	30-47	2C2	SL-SCL	EH	57	22	21	SCL		8.32	0.85	7.15	0.63	0.24	10.84	2.3			

Trail Series

The soils in the Trail series are classified as Typic Torrifuvents, sandy, mixed, mesic. These deep, well drained and somewhat excessively drained soils are on flood plains, alluvial fans and dissected terraces. The soils formed in stratified alluvium primarily from sandstone.

Typifying pedon: Trail loamy sand, 0 to 8 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1987.

- A- 0 to 3 inches; light brown (7/5 YR 6/4) loamy sand, brown (7.5 YR 5/4) moist; single grain; loose, nonsticky and nonplastic; noneffervescent; moderately alkaline; abrupt wavy boundary.
- C1- 3 to 20 inches; light brown (7.5 YR 6/4) loamy sand, brown (7.5 YR 5/4) moist; single grain, slightly hard, nonsticky and nonplastic; noneffervescent; moderately alkaline; abrupt wavy boundary.
- C2- 20 to 60 inches; light brown (7.5 YR 6/4) loamy sand, brown (7.5 YR 5/4) moist; massive; slightly hard, nonsticky and nonplastic; a few very thin (<1/4") strata of very fine sandy loam, fine sandy loam, fine sandy loam and sandy clay loam; slightly effervescent; moderately alkaline.

The C horizon has texture of dominantly loamy sand with loamy fine sand, or sand. Strata of fine sandy loam, sandy loam and sandy loam are common. The hue for the C horizon is 10 YR or 7.5 YR. The Trail series has been described as having SA values less than 13. Similar soils with higher SA values are mapped as Beebe series. For this survey the sandy, mixed, mesic family of Typic Torrifuvents were mapped as the Trail series which has Sa values ranging from less than 1 to values higher than 50.

The range of topdressing depth is 0 to 94 inches. The limiting factors for topdressing are bedrock, SA and dry consistence. The Trail series was described at 49 sites in the survey area.

TRAIL SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%			%	DSM			meq/l			%	meq/100g		%	
SAMPLE NOT TAKEN																					

TRAIL SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%			%	DSM			meq/l			%	meq/100g		%	
II	21	S	0-8	A	SL-SCL	H-VH	62	21	17	SL	35	8.56	0.84	7.89	0.50	0.13	14.06	8.5	3.05	11.00	25.18
		U	8-17	C1	SL	H	78	11	13	SL		8.47	8.50	163.00	15.30	3.60	53.02	8.0			
III	63	U	0-8	C1	S	VH	86	4	10	LS	34	8.53	1.03	10.00	4.02	0.96	8.81	2.7			
		U	8-17	C2	S	VH	77	9	14	SL	78	8.43	2.21	20.30	1.29	0.34	22.49	4.1	4.86	10.30	32.23
		U	17-36	C3	S	VH	87	4	9	LS	55	8.24	5.50	50.20	4.03	3.52	25.84	1.8	4.28	4.86	31.28
		U	36-60	C4	S	VH	75	9	18	SL	70	8.52	1.87	15.30	1.24	0.44	18.89	2.1	4.88	11.43	33.33
III	63R	U	60-80				66	12	22	SCL	78	8.39	2.80	28.00	2.31	1.18	21.20	2.9	5.35	13.72	23.10
		S	80-100				85	12	23	SCL	79	8.49	1.50	14.20	1.18	0.48	15.78	3.3	3.11	14.83	26.90
		U	100-120				81	15	24	SCL	81	8.38	1.48	15.70	1.10	0.38	18.25	2.8	4.77	14.15	26.93
		M	120-150				62	13	25	SCL	62	8.46	1.50	15.20	1.28	0.51	16.07	2.6	4.86	14.52	27.00
		U	150-180				59	15	26	SCL	72	8.28	2.50	25.90	2.46	1.28	18.89	3.0	5.03	14.08	44.57
		U	180-210				52	22	28	SCL		8.42	2.12	19.80	1.53	0.84	19.01	8.8			
		U	210-234				31	35	34	CL	100	8.38	1.90	16.70	0.77	0.83	22.35	7.1	6.38	18.63	24.21

TRAIL SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			ft				%				%		DS/M	meq/l				%	meq/100g		
III	73	S	0-8	C1	FS-LFS	H	58	21	21	SCL	66	8.24	3.30	27.09	4.37	1.15	18.31	2.4	3.87	17.70	11.75
		U	8-26	C2	FS-LFS	VH	68	15	17	SL		8.52	8.20	56.70	3.66	3.12	30.60	2.1			
		U	26-46	C3	FS-LFS	VH	68	18	18	SL		8.83	1.80	14.52	0.70	0.33	20.23	3.4			
		U	46-80	C4	FS-LFS	VH	59	17	24	SCL		8.50	2.30	20.12	0.60	0.60	21.51	2.9			
III	168	S	0-6	A	SL-SCL	H-VH	78	8	18	SL		8.07	0.50	4.61	1.13	0.13	8.08	2.9			
		U	6-32	C	SL	H	72	8	20	SCL/SL	44	8.00	5.80	63.70	13.60	1.86	22.91	2.4	5.06	10.30	22.14
EQ-15	38	S	0-18	C1	GS	SH	90	1	9	S	27	7.96	0.59	4.02	1.32	0.14	4.71	1.8			
		S	16-39	C2	S	H-VH	91	2	7	S	28	7.99	0.87	8.01	1.32	0.25	8.78	1.1			
EQ-15	45	S	4-20(A)	C	S	H-VH	68	8	8	S	28	8.02	0.30	1.09	1.78	0.14	1.11	11.4			
		S	20-78(B)	C	S	H-VH	92	0	8	S	30	7.96	0.25	0.55	1.36	0.14	0.64	1.3			
EQ-15	81	S	5-28	C	SL	SHH	85	5	10	LS	30	7.96	0.45	3.03	0.83	0.14	4.14	2.2			

Tsaya Series

The soils in the Tsaya series are classified as Lithic Torriorthents, loamy-skeletal, mixed (calcareous), mesic. These very shallow and shallow, well drained soils occur on mesas and hillslopes. The soils are formed in alluvium and eolian materials derived from sandstone and shale.

Typifying pedon: Tsaya extremely channery sandy clay loam, 0 to 8 percent slopes. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1987.

- A- 0 to 2 inches; light yellowish brown (10 YR 6/4) extremely channery sandy clay loam, brown (10 YR 4/3) moist; weak medium subangular blocky structure; hard, slightly sticky and plastic; 70 percent channers; slightly effervescent; moderately alkaline; clear wavy boundary.
- C- 2 to 7 inches; yellowish brown (10 YR 5/4) extremely channery sandy clay loam, dark yellowish brown (10 YR 4/4) moist; weak medium subangular blocky structure; very hard, sticky and plastic; 75 percent channers; slightly effervescent; moderately alkaline; abrupt wavy boundary.
- 2R- 7 inches; shale and sandstone.

The depth to lithic contact ranges from 4 to 20 inches. The limiting factors for topdressing are bedrock and rock fragments. The Tsaya series was described at 4 sites in the survey area. Laboratory samples were not collected because of the limited extent of this series at the Navajo Mine.

Uffens series

The soils in the Uffens series are classified as Typic Natrargids, fine-loamy, mixed, mesic. These deep, well drained, sodium-affected soils are in valleys, and on alluvial fans, mesas and plateaus. The soils formed in alluvium derived from shale.

Typifying pedon: Uffens sandy clay loam, 0 to 8 percent slopes. Location is Area III, site 65.

E- 0 to 3 inches; light gray (10 YR 7.2) sandy clay loam, grayish brown (10 YR 5/2) moist; weak thin platy structure; hard, slightly sticky and slightly plastic; strongly calcareous; strongly alkaline; clear smooth boundary.

Btn1- 3 to 9 inches; light brownish gray (2.5 Y 6/2) sandy clay loam, dark grayish brown (2.5 Y 4/2) moist; moderate medium columnar structure that parts to weak fine blocky; slightly hard to hard, slightly sticky and plastic; common thin clay films on faces of peds; strongly calcareous; very strongly alkaline; clear smooth boundary.

Btn2- 9 to 22 inches; very pale brown (10 YR 7.3) sandy clay loam, brown (10 YR 5/3) moist; weak medium prismatic structure that parts to weak medium blocky; hard, sticky and plastic; many thin clay films on faces of peds; strongly calcareous; very strongly alkaline; clear smooth boundary.

- C1- 22 to 40 inches; light gray (10 YR 7/2) sandy clay loam, grayish brown (10 YR 5/2) moist; massive; hard, slightly sticky and plastic; strongly calcareous; strongly alkaline; clear smooth boundary..
- C2- 40 to 60 inches; light gray (10 YR 6/2) sandy loam, grayish brown (10 YR 5/2) moist; massive; hard; slightly sticky and slightly plastic; strongly calcareous; strongly alkaline; clear smooth boundary.

The solum is 8 to 25 inches thick. The exchangeable sodium is 25 to 75 percent. The A horizon is loamy sand to clay. It has a hue ranging from 2.5 Y to 7.5 YR. The Bt horizon is sandy clay loam or 2.5 Y. The C horizon ranges from loamy sand to clay and the hue from 7.5 YR to 2.5 Y.

The range of topdressing depth is 0 to 20 inches. Suitable topdressing material is sandy eolian deposits on the surface. The limiting factors for topdressing are SA and dry consistence. The Uffens series was described at 157 sites in the survey area.

UFFENS SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL										
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			in				%			%		DS/M		meq/l			%		meq/100g		%	
III	85	U	0-3	E	SL	H	59	19	22	SCL		43	8.01	5.08	42.30	8.85	0.80	21.49	3.1	5.20	15.87	21.57
		U	3-9	Bm1	SCL	SH-H	52	20	28	SCL			8.17	8.38	107.00	7.59	1.55	50.05	2.8			
		U	9-22	Bm2	SL	H	52	18	32	SCL			8.08	10.30	128.00	7.86	2.55	55.23	2.9			
		U	22-40	C1	S-Ls	H	87	11	22	SCL			8.05	7.82	81.30	8.78	3.34	38.14	2.3			
		U	40-60	C2	GS-GSL	H	86	18	18	SL		60	8.05	5.13	44.20	4.88	2.69	22.72	7.8	5.23	12.09	21.34

UFFENS SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL										
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP	
			in				%			%		DS/M		meq/l			%		meq/100g		%	
I	5	S	0-8	A	LS	S-SH	84	5	11	LS			8.08	0.58	3.15	3.44	0.42	2.27	2.0			
		S	8-14	AB	SL	H	86	5	9	LS		29	8.22	0.54	5.28	2.15	0.24	4.81	1.7			
		U	14-32	Bmk1	SL	VH	81	17	22	SCL		58	7.88	5.09	44.20	9.52	1.89	18.51	4.5	5.83	17.85	18.32
		U	32-46	Bmk2	SCL	VH	83	13	24	SCL			8.08	7.18	71.70	8.60	3.08	32.59	3.2			
		U	46-80	Bck	SCL-SL	VH	88	13	21	SCL			8.08	8.50	62.10	7.18	2.80	27.80	3.8			
I	5R	U	80-78				65	11	24	SCL			8.20	8.10	84.50	6.18	4.80	40.70	3.1			
		U	78-96				65	8	27	SCL			8.15	7.15	72.00	4.71	3.13	38.37	2.8			
		U	96-120				88	13	21	SCL			8.03	7.15	79.00	5.78	3.58	38.40	1.7			
		U	120-150				78	5	19	SL		44	8.05	5.00	48.50	8.85	2.59	22.58	2.1	4.48	8.55	24.72
		U	150-180				79	4	17	SL		39	7.94	4.50	42.50	8.34	2.89	19.78	2.2	3.80	10.02	19.38
		S	180-204				91	0	9	S		31	8.27	1.85	17.82	3.83	1.88	10.74	0.8			
		U	204-240				28	25	47	C		90	7.93	4.50	42.80	5.58	3.72	19.78	3.2	9.05	27.72	8.80

UFFENS SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.:	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%	%	%		%	DS/M	meq/l	meq/l	meq/l	meq/l	meq/l	meq/100g	meq/100g	meq/100g	
I	29	S	0-4	A	SCL	S	81	13	26	SCL		8.41	0.85	8.44	0.88	0.24	11.28	4.1			
		U	4-24	Bnk	SCL	VH	82	11	27	SCL		8.37	3.60	40.10	1.64	0.60	36.30	8.9			
I	89	S	0-3	A	SL	H-VH	58	12	30	SCL		8.53	1.30	12.10	0.97	0.14	16.24	3.7			
		S	3-6	Bkn	SCL-SL	H-VH	58	12	30	SCL		8.04	7.70	84.50	19.10	1.36	28.42	3.8			
		U	6-12	Bnk	SCL	H-VH	58	15	29	SCL		8.10	8.00	96.20	19.20	1.99	29.55	4.8			
		U	12-18	C	SCL	H-VH	74	9	17	SL		8.20	7.80	93.00	17.40	2.28	29.86	3.8			
		U	18-42	2C	SCL	H-VH	66	11	23	SCL		8.85	2.80	32.50	1.18	0.32	37.53	1.1			
		U	42-53	3Bt	SL	VH	66	24	10	SL		8.08	0.70	8.80	0.66	0.07	10.92	3.6			
		U	53-73	3C	SL	VH	63	12	25	SCL		7.95	5.20	48.50	22.20	1.26	14.16	1.7	3.25	8.77	19.85
I	98	U	0-11	Bkn	SCL	VH	78	8	16	SL	31	8.08	8.80	70.70	18.10	1.88	23.58	0.5	3.86	4.99	2.46
		U	11-19	Sk	SCL	VH	89	1	10	LS	31	7.91	7.00	82.00	21.60	3.62	23.00	1.2	4.57	6.75	18.51
		U	19-28	C	SL	H	78	8	18	SL	36	7.86	0.86	8.80	1.78	0.24	8.80	3.0			
		U	28-71	2C	SL	H-VH	52	18	30	SCL	52	8.00	3.30	30.20	6.63	0.69	15.79	3.5	4.94	18.60	18.12
I	112	S	0-2	A	CL	H	42	28	32	CL	87	7.88	7.20	78.50	18.00	3.23	24.09	3.4	10.70	24.70	22.02
		U	2-11	Bnk	CL	VH	82	17	21	SCL		8.01	4.70	45.80	5.28	1.24	25.37	4.1			
		U	11-26	2C	CL	H-VH	52	18	30	SCL		7.93	6.80	69.70	17.00	2.65	22.24	2.7			
		U	26-50	3C	SL	H-VH	43	24	33	CL		7.26	1.25	10.60	2.52	0.35	8.85	2.5			
		U	50-85	4Ck	SCL	VH	57	17	26	SCL	52	8.14	4.10	40.40	5.36	0.70	23.21	5.0	8.01	18.00	21.72
I	125	S	0-6	Bkn	CL	H	54	16	30	SCL	85	8.06	6.90	71.30	17.60	2.14	22.66	2.4	8.74	22.60	22.61
		U	6-12	Bnk	CL	VH	71	11	18	SL		8.02	7.30	79.70	17.30	1.63	26.91	5.6			
		U	12-34	C	SL	H															
		U	34-79	2C	SL	H															

UFFENS SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			-in-				—%—				—%—		DS/M	—meq/—				—%—	—meq/100g—	—%—	
I	131	U	0-5	Btk	CL	VH	87	8	25	SCL		8.12	4.80	55.60	3.42	0.43	40.02	8.7			
		U	5-15	Btk	CL	H	55	15	30	SCL		8.50	12.00	401.00	18.80	2.89	122.91	8.4			
		U	15-34	C1	SL-SCL	SH	83	4	13	LS		8.59	11.00	157.00	1.89	3.09	101.55	2.3			
II	17	S	0-2	B(n)	SCL	SH	59	11	30	SCL		8.24	0.52	4.36	0.87	0.11	8.23	1.2			
		U	2-12	C1	SCL	VH	57	13	30	SCL		8.34	0.64	8.33	0.51	0.07	11.75	1.9			
II	18	U	0-19	A-B(n)	CL	VH	58	12	30	SCL		8.11	0.83	7.91	0.85	0.11	12.83	1.9			
		U	19-28	Btk	CL	SH-H	80	10	30	SCL		7.87	5.50	79.80	18.90	2.59	25.50	1.6			
		U	28-51	C1-2	CL-SCL	VH-EH	67	11	22	SCL		8.03	4.20	41.80	5.45	1.41	22.46	2.0			
II	24	S	0-4	A	SCL	SH	56	11	33	SCL		8.12	0.45	4.28	0.71	0.08	8.81	2.4			
		U	4-10	Bt	SCL	VH	73	7	20	SCL/SL		8.18	0.48	3.99	0.95	0.09	9.53	2.2			
III	3	S	0-4	E	L-CL	S	57	18	25	SCL		8.07	0.78	8.21	3.39	0.40	4.51	4.6			
		U	4-12	B(n)	CL	VH	53	17	30	SCL		8.12	0.87	7.17	1.28	0.17	8.49	4.9			
		U	12-28	2Btkb	CL	H	48	17	34	SCL	52	8.11	2.85	25.80	3.38	0.27	18.92	3.8	4.84	15.97	20.73
		U	28-35	3Btkb	CL	H	48	18	33	SCL		7.97	7.50	88.00	8.08	1.44	44.41	13.2			
		U	35-60	4Btkb	CL	H	47	18	35	SC/SCL	58	8.01	8.00	95.80	8.07	1.97	47.68	2.0			
III	39	S	0-3	A	CL	SH	53	18	29	SCL		7.88	0.95	8.13	2.87	0.38	8.81	2.2			
		U	3-11	B(n)	CL	VH	49	14	37	SC		8.10	1.40	11.50	1.43	0.28	12.52	2.5	8.08	22.00	24.50
		U	11-24	Btk1	C-SL	VH	62	15	23	SCL		7.96	8.20	98.00	8.13	1.83	49.12	1.9			
		U	24-38	Btk2	C-SL	VH	38	8	54	C	133	8.03	8.20	93.20	5.90	2.10	48.80	4.0			
		U	38-48	2C1	S	H	62	7	11	LS		7.90	6.40	89.30	8.31	2.10	33.79	1.4			
		U	48-60	2C2	S	H	64	8	10	LS	45	8.12	8.50	87.40	8.42	2.28	32.30	1.7			

UFFENS SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			LABORATORY-PHYSICAL						LABORATORY-CHEMICAL									
			DEPTH	HDRIZON	TEXTURE	DRY CONSIST.	SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			ft				%				%		DSM	meq/l				%	meq/100g		
III	53	S	0-5	A	SL	SH	79	3	18	SL		8.20	0.38	2.24	1.49	0.18	2.47	2.7			
		U	5-21	Bt(n)	SL	VH	78	5	17	SL		8.80	0.70	8.54	1.10	0.18	8.24	2.8			
		U	21-36	Btk	SCL	VH	68	10	24	SCL	37	8.33	2.80	25.03	2.81	0.37	19.85	4.8	3.20	18.00	14.18
		U	36-48	Btk	SCL	VH	68	10	24	SCL	36	8.12	4.40	38.72	8.50	0.91	20.12	3.9	3.07	14.00	12.00
		U	48-60	B/C	SL	VH	70	8	22	SCL	34	8.28	2.90	26.41	2.72	0.42	21.08	3.9	2.83	14.10	13.89
III	100	S	0-4	A	SL	H-VH	74	12	14	SL		8.07	0.52	3.88	1.80	0.24	3.52	2.2			
		U	4-17	Btk	SL	VH	78	8	14	SL	31	8.45	1.10	10.80	0.72	0.11	18.78	2.9	3.46	8.79	35.81
		U	17-26	C	SL	VH	87	5	8	LS		8.28	2.90	30.90	2.44	0.54	25.31	0.9			
		U	26-59	2Bt	SL	EH	64	7	9	LS	44	8.49	1.80	20.50	3.22	0.81	14.81	1.7	3.24	5.86	39.93
III	108	S	0-4	A	SL	H	62	8	12	LS		7.98	0.62	4.57	1.84	0.20	4.78	3.7			
		U	4-15	Btk	SL	VH	86	4	10	LS		8.25	1.90	18.10	2.85	0.43	14.13	3.3	2.03	8.40	22.03
		U	15-41	C1	SL-LS	H-VH	92	0	8	S		8.45	4.30	42.00	3.41	2.17	25.14	0.4			
		U	41-91	C2	SL	SH-H	92	0	8	S		8.66	3.50	35.80	1.81	1.18	30.15	1.8			
III	111	S	0-4	Bt(n)	SL	H	69	10	21	SCL		7.97	0.77	8.74	1.42	0.12	7.88	5.3			
		U	4-24	C	LS	H	75	7	18	SL		8.18	2.80	26.30	2.58	0.21	22.35	2.8			
III	118	S	0-6	A	SL	H-VH	81	3	18	SL		8.28	0.47	3.95	0.94	0.13	5.40	1.8			
		U	6-24	Btk	CL	VH-EH	39	28	35	CL		7.85	5.95	85.70	17.40	1.82	21.19	2.2			
		U	24-59	C	SL	EH	85	3	12	LS	38	8.53	2.10	22.30	1.80	0.32	21.68	1.3	3.20	8.58	35.71
III	117	S	0-5	Btk	SCL-CL	H-VH	85	9	26	SCL		8.25	1.30	12.90	1.08	0.11	18.72	2.4			
		U	5-12	Btk	CL	H-VH	42	18	40	CLC		7.95	7.80	93.50	1.50	1.92	71.50	2.7			
III	148	U	0-18	Bt(n)k	SCL	VH	78	8	18	SL		8.18	1.20	9.38	1.17	0.18	11.42	4.9			
		U	18-41	C	SCL	VH-EH	73	13	14	SL	37	8.01	8.90	72.80	17.40	4.68	21.81	3.9	5.11	9.88	25.00

UFFENS SERIES ADDITIONAL SITE LABORATORY DATA (cont)

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL									
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC	ESP
			in				%	%	%		%		DS/M	meq/l	meq/l	meq/l		meq/100g	meq/100g		
III	183	U	0-4	Bt(n)	SL	VH-EH	76	9	15	SL		6.69	0.72	7.13	0.65	0.17	11.14	1.0			
		U	4-26	Bt	SL	VH	82	6	12	LS	21	6.50	1.80	20.00	2.07	0.42	17.82	1.3	3.07	7.40	31.55
		U	28-63	Btk/C	SL	VH-EH	81	3	18	SL		6.23	2.80	30.00	3.47	0.77	20.60	1.5			
III	190	S	0-5	A	SCL	H	67	13	20	SCL/SL		7.83	0.33	1.40	1.58	0.22	1.46	3.6			
		U	5-29	Bt	SCL	VH	70	11	19	SL		8.50	0.89	6.22	0.53	0.15	14.10	3.6			
		U	29-36	Btk1	SCL	VH	57	13	30	SCL	43	7.75	6.40	56.80	19.00	4.12	17.59	3.6	5.38	14.60	19.25
		U	36-49	Btk2	SCL	VH	65	12	23	SCL	42	6.09	3.30	33.50	3.72	0.82	21.99	6.9	3.60	11.00	21.73
		U	49-69	Ck	SL	VH-EH	76	11	13	SL		7.80	4.20	31.50	17.10	3.58	8.60	3.6			
		U	69-79	C	SL	EH	79	6	15	SL	35	6.42	1.80	14.80	1.62	0.37	14.64	3.3	2.31	7.63	23.77
III	203	S	0-10	A	SL	H	77	8	15	SL		7.96	0.39	0.89	2.33	0.29	0.78	1.2			
		U	10-28	Btk1	SCL	VH	67	11	22	SCL		6.58	0.71	7.18	0.45	0.16	13.00	3.7			
		U	28-59	Btk2	SCL	VH	66	11	23	SCL		7.85	5.50	47.10	19.10	2.99	14.17	3.6			
		U	59-79	C	SL	VH	72	9	19	SL	33	8.03	2.10	16.10	3.99	0.67	11.66	3.2	2.46	9.98	18.64
III	324	S	0-4	A	SCL	H	68	10	22	SCL		6.03	0.61	4.46	2.63	0.41	3.50	1.9			
		U	4-32	Bt	CL	VH-EH	57	18	27	SCL		8.37	0.82	6.79	0.60	0.10	14.86	4.6			
		U	32-44	Btk	CL-SCL	VH-EH	56	15	29	SCL		6.21	2.80	16.60	1.58	0.32	17.12	2.6			

Wingrock Series

The soils in the Wingrock series are classified as Typic Camborthids, coarse-loamy, mixed, mesic. These deep, well drained soils are on terraces formed from alluvium that is derived from sandstone and shale.

Typifying pedon: Wingrock loamy sand, 0 to 3 percent slope. Pedon description taken from Shiprock Survey, Soil Conservation Service, 1987.

- A- 0 to 5 inches; brown (10 YR 5/3) loamy sand, brown (10 YR 4/3) moist; weak fine granular structure; soft, nonsticky and nonplastic; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bw- 5 to 12 inches; brown (10 YR 5/3) sandy loam, brown (10 YR 4/3) moist; moderate coarse subangular blocky structure; slightly hard, slightly sticky and nonplastic; strongly effervescent; strongly alkaline; clear wavy boundary.
- Bk- 12 to 36 inches; brown (10 YR 6/3) coarse sandy loam, brown (10 YR 4/3) moist; moderate coarse subangular blocky structure; soft, slightly sticky and nonplastic; strongly effervescent secondary calcium carbonates segregated in few fine irregularly shaped accumulations on faces of peds and rock fragments; strongly alkaline; clear wavy boundary.

Bck- 36 to 50 inches; pale brown (10 YR 6/3) sandy loam, brown (10 YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, slightly sticky and slightly plastic; strongly effervescent, secondary calcium carbonates segregated in few fine irregularly shaped accumulations on rock fragments; strongly alkaline.

The Bw horizon ranges from depth of 5 to 20 inches and Bk from 20 to 30 inches thick, The clay content ranges from 10 to 18 percent clay in the control section. The series has been proposed for the Western San Juan County, NM soil survey (1987).

The range of topdressing depth is 8 to 43 inches. The limiting factors for topdressing bedrock and dry consistence. The Wingrock series was described at 8 sites in the survey area. Samples from a typifying pedon were not collected.

WINGROCK SERIES TYPIFYING PEDON LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL								
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC
			-in-				-%					DS/M -meq/l- -% -meq/100g- -%--								
SAMPLE NOT TAKEN																				

WINGROCK SERIES ADDITIONAL SITE LABORATORY DATA

AREA	SITE#	SUIT	FIELD DETERMINATIONS			DRY CONSIST.:	LABORATORY-PHYSICAL					LABORATORY-CHEMICAL								
			DEPTH	HORIZON	TEXTURE		SAND	SILT	CLAY	CLASS	SAT	pH	E.C.	NA	CA	MG	SAR	CaCO3	NA	CEC
			-in-				-%					DS/M -meq/l- -% -meq/100g- -%--								
IV	478	S	0-4	A	SL	SH	78	11	13	SL	29	7.43	1.00	3.12	8.03	0.02	1.60	3.8		
		S	4-14	Bw	SL	H	77	7	18	SL	27	7.96	0.54	4.14	1.06	0.19	5.20	3.2		
EQ-9	15	S	0-6	A	LS	S	87	4	9	LS	31	7.48	0.56	0.83	3.22	0.82	0.80	3.3		
		S	6-19	Bw	SL	SH	90	2	8	S	31	7.73	0.42	1.06	2.10	0.44	0.98	3.8		
		S	19-43	Bwk	SL	SH	90	3	7	SCL	31	7.74	0.44	1.03	2.18	0.73	0.85	3.3		

APPENDIX 8-G

**BIA-LAND OPERATIONS LETTER AND
USDA-SCS LETTER**

APPENDIX 8-G

BIA-Land Operations letter



United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

Shiprock Agency

P.O. Box 966

Shiprock, New Mexico 87420

IN REPLY REFER TO:
Economic Development
Land Operations

March 4, 1983

Navajo Mine
William Skeet
Environmental Coordinator
P.O. Box 155
Fruitland, New Mexico 87416

Dear Mr. Skeet:

The intent of this correspondence is to clarify the land use status of the area presently under lease by Utah International (Navajo Mine).

The predominant use of the area in question has been in the form of livestock grazing. Although dryland farming has been attempted, these endeavors have been very limited in scope and have met with marginal results.

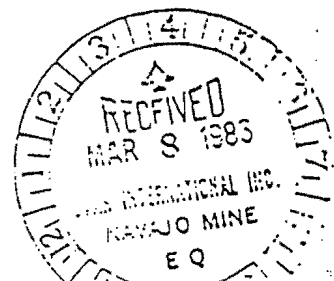
Furthermore, the physical and chemical characteristics of the soil types in the area, when coupled with the lack of available irrigation water, precludes the existence of prime farmland in the vicinity of the lease.

If I can be of any further assistance, please do not hesitate to contact me.

Respectfully,

Jerry W. Thomas
Natural Resource Manager

8-G-1



APPENDIX 8-G (cont)

USDA-SCS letter

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE 424 N. Mesa Verde; Aztec, NM 87410

December 8, 1983

Mr. Bill Skeet
Navajo Mine
P. O. Box 155
Fruitland, NM 87416

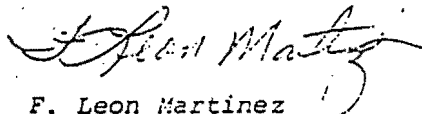
Dear Bill:

In response to our telephone conversation on December 8, 1983 regarding prime farmland in the Navajo Mine Area:

The prime farmland in San Juan County is all only on irrigated lands. There is no prime farmland on Navajo Mine itself, as shown on the attached map "Important Farmlands - San Juan County, New Mexico, November 1982."

If we can be of further assistance, please feel free to call us.

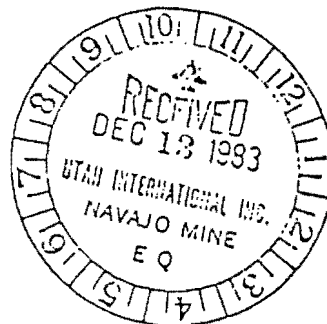
Sincerely,



F. Leon Martinez
Soil Conservationist

enc.
FLM:pc

8-G-2



Soil Survey of the Lowe Boxcut Exchange Area At Navajo Mine

Appendix 8-H

Prepared by

Buchanan Consultants, Ltd.
220 West Main
Farmington, New Mexico

Prepared for

BHP World Minerals

Navajo Mine

September 2000



Table of Contents

Introduction.....	1
General Nature of the Survey Area.....	1
Soil Survey Procedures.....	2
Results.....	6
References.....	8

List of Tables

Table 1.	OSMRE Topsoil and Topsoil Substitute Suitability Criteria for Navajo Mine.....	4
Table 2.	Area, percent of area, and volume of topdressing available from each soil mapping unit located in the Lowe Boxcut Exchange Area, Navajo Mine.....	7

List of Exhibits

Exhibit 1.	Lowe Boxcut Exchange Area Detailed Soils Map	9
------------	--	---

List of Appendices

Appendix A.	Area and volume of available topdressing for each soil map unit delineation in the Lowe Boxcut Exchange Area, Navajo Mine
Appendix B.	Northing, easting, depth of topdressing, and depth to bedrock for each soil survey site located in the Lowe Boxcut Exchange Area, Navajo Mine
Appendix C.	Lowe Boxcut Exchange Laboratory Data
Appendix D.	Soil Profile Descriptions

Introduction

A Second-Order Soil Survey was conducted by Buchanan Consultants, Ltd. (BCL), Farmington, New Mexico beginning in May 2000, to determine soil resources for the Lowe Boxcut Exchange at Navajo Mine Area (LBE/NJM). The proposed extension area is adjacent to the southeastern part of Area III at Navajo Mine. The objective of this survey is to document the types and proportions of soil and to assess the quantity of topdressing material available from the area.

This survey is intended to be used for obtaining mining permits and as a planning tool for mine operations. It describes the general location and quantity of salvageable topdressing within the survey area. This survey was conducted using established standards and procedures similar to those used during the 1985 Baseline Soil Survey for Navajo Mine. The information in this report is to be used for estimating the amount of suitable topdressing material available for reclamation and to supplement on-site investigations of topdressing removal areas.

General Nature of the Survey Area

The soil survey area is located within the Colorado Plateau physiographic province (Fennenon, 1983). The Colorado Plateau has within its borders a broad diversity of geologic materials, topography, soils, wildlife, and vegetation. The general terrain in the vicinity of the Navajo Mine is characterized by rough, broken topography, badlands, plateaus, and mesas, intermingled with escarpments and valleys or washes. The soils within the survey area are formed from eolian and alluvial sediments derived

from shale and sandstone. Climatic information for NJM can be found in Chapter 4 of the NJM Permit Application Package (PAP).

Soil Survey Procedures

The fieldwork for the LBE/NJM was conducted during May 2000. Aerial photographs (scale 1:24000) of the LBE/NJM were obtained from the National Aerial Photography Program (NAPP). These photographs were studied stereoscopically to provide predictions about the types and boundaries of soils. Tentative soil delineations were drawn on the photographs then digitized and transferred to an orthophotographic base-map. Predictions of soil types and boundaries were tested at sites located in the field.

The density of test-sites was determined by the complexity of soils within an area. A higher density of test-sites was used in areas of complex soils, and a lower density of test sites was used in more homogeneous areas. The location of all test sites was determined using a Trimble Pathfinder Pro-XL Global Positioning System (GPS). Differential corrections were obtained from the Mesa Verde National Park GPS Pathfinder Community Base Station Bulletinboard, which is maintained by the National Park Service. All site location data are presented using New Mexico West State Plane Coordinates (North American Datum 1927).

At each site, a soil pit was excavated to a depth of 60 inches or to a lithic contact, whichever was more shallow. Excavation was not necessary at some test sites because the soil type and its suitability for use as topdressing could be accurately predicted from the surface and from nearby test sites. At each excavated site, a description of the soil

profile was written. Descriptions included depth, texture, consistence, structure, effervescence, dry and moist Munsell color, visible salts, and quantity of coarse fragments for each soil horizon. Also noted were soil type, physiography, current vegetation, slope, aspect, depth of suitable topdressing, and any additional information pertinent to pedon classification or topdressing suitability determinations.

Soil samples were collected from selected soil profiles that represented extensive soil components, soils that could not be classified in the field, or questionable topdressing resources. All samples were analyzed by Inter-Mountain Laboratories (IML), Farmington, New Mexico, for pH, electrical conductivity (EC), saturation percent (SP%), calcium, magnesium, sodium, sodium adsorption ratio (SAR), textural class (USDA) with percent sand, percent silt, and percent clay, carbonate percent, acid-base potential (ABP), hot-water-soluble boron, hot-water-soluble selenium, and total selenium. The methods used for soil analysis are described in Appendix 8-A of the NJM/PAP. The Topsoil and Topsoil Substitute Suitability Criteria for Navajo Mine were used to evaluate the suitability of all soil samples (Table 1).

As a group of test site descriptions were completed, delineations drawn on the orthophotograph were either verified or were changed to reflect field observations. An attempt was made to place a minimum of one test-site in each map unit delineation. The adjusted soil map unit delineations were digitized using PC-ARCINFO. The base map scale for this survey was 1:24000. The soils map is presented at a scale of 1:6000 for this report. This enlargement does not provide additional mapping detail beyond the scale of the base map. Soil mapping unit delineations were named on the basis of the soil components that exist within them. A map unit is a collection of soil areas or of

Table 1. OSMRE Topsoil and Topsoil Substitute Suitability Criteria for Navajo Mine.

	Good	Marginal	Unsuitable
PH	6.0-8.4	5.5-6.0 8.4-8.8	< 5.5 > 8.8
EC mmhos/cm	< 4.0	4.0-12.0	> 12.0
SAR			
sl and coarser	< 12.0	12.0-18.0	> 18.0
l and cl	< 10.0	10.0-16.0	> 16.0
40% clay	< 8.0	8.0-14.0	> 14.0
Texture	ls, sl, l, sil, with 35% c	s, lcs, cl, sicl with 45%	> 45% c
Saturation %	25-80	25-80	< 20 > 80
CaCO ₃ %	0-15	15-30	> 30
Coarse Fragments			
< 3 inch %	15	15-35	> 35
> 3 inch %	3	3-10	> 10
Erosion Factor	< .37	< .37	
Pyritic Sulfur	+5 T CaCO ₃ equiv./1000T	+0 T CaCO ₃ equiv./1000T	< -5 T CaCO ₃ equiv./1000T
Acid-base potential			
Boron	5 ppm	5 ppm	> 5 ppm
Selenium (Total)		≤ 0.8 ppm	> 0.8 ppm
Selenium (Extractable)		≤ 0.15 ppm	> 0.15 ppm

miscellaneous land types delineated in a soil survey. The components of a map unit are

- (i) the named soils or miscellaneous areas that are dominant or co-dominant in extent,
- (ii) similar soils or miscellaneous areas that may be extensive but not as extensive as the named components, and (iii) dissimilar soils or miscellaneous areas that are minor in

extent. Dissimilar components are those soils or miscellaneous areas which differ enough from the named components to affect major interpretations. Conversely, similar components are those soils that differ so little from named components that their soil interpretations for most uses (i.e., topdressing) are highly similar (USDA, 1996).

The components used to name the soil mapping units were phases of soil series and series variants, using surface texture, depth of suitable topdressing, dry consistence, and slope as phase criteria. A series variant has properties sufficiently different from the named soil series to suggest the establishment of a new series. The variant, however, is of such limited, known extent, that the creation of a new series is not justified (Soil Survey Division Staff, 1993). A key was developed to determine the classification of each soil type encountered in the LBE/NJM (NJM/PAP Section 8.7 Key to Soils). The types of soil mapping units used in this survey were consociations, complexes, and undifferentiated groups. The delineated areas of a consociation are dominantly a single soil taxon (or miscellaneous land type) and similar soils. Consociations were used in areas with predictable and homogeneous types of soil that provide similar depths of suitable topdressing. Complexes are composed of two or more dissimilar components that occur in a regular and predictable pattern. Complexes were used if dissimilar soils had a regular pattern of distribution but were not feasible to delineate separately at the base-map scale used. Undifferentiated groups consist of two or more taxon components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. Undifferentiated map units were mainly used when components had similar topdressing suitability and there was no advantage in determining component composition (USDA 1996).

Topdressing availability was calculated for each map unit delineation as a volume estimated from the mean topdressing thickness and area of the map unit. These calculations can be found for each individual map delineation in Appendix A. These volumes were summed to provide the total quantity of topdressing material available from each map unit and from the LBE/NJM. The total volume of topdressing available from the area was then reduced by 20 percent to account for estimated losses during recovery and handling; thus, providing the estimated volume of topdressing material available for reclamation from the LBE/NJM.

The extent and proportion of each soil map unit in the LBE/NJM is shown on the detailed soils map (scale 1:6000). *Exhibit 1. Lowe Boxcut Exchange Area Detailed Soils Map.* Each map unit delineation on the soils map represents an area on the landscape and consists of one or more components for which the map unit is named. A unique symbol is used in each delineation to distinguish the soil mapping unit name. The area (acres) and depth (inches) of suitable topdressing is also given for each delineation.

Results

A Second-Order Soil Survey of 107 acres was conducted for BHP Minerals, LBE/NJM. The soils in this area are complex and variable. Constructional and erosional processes have influenced the geomorphic surface.

A total of 11 mapping units were described using 9 soil series. A description of each soil mapping unit used in this survey, including the proportion and distribution of named components and inclusions, can be found in Section 8.5.2 Soil Mapping Unit

Descriptions of the NJM/PAP. The extent and proportion of each soil mapping unit is given in Table 2.

Table 2. Area, percent of area, and volume of topdressing available from each soil mapping unit located in the Lowe Boxcut Exchange Area, Navajo Mine.

Soil Symbol	Soil mapping Unit	Area Ac.	Percent of Area	Volume of Topdressing
Bc	Blancot	1.6	1.5	13,129
Bh	Blancot, very hard	32	29.9	210,351
Jh	Jocity, very hard	5.9	5.5	45,751
Ma	Mack	2.5	2.3	19,969
Ms	Mayqueen-Shiprock	6.2	5.8	49,743
Nt	Natrargids	38	35.5	0
Ra	Razito	9.3	8.7	74,822
Rh	Razito, very hard	2.2	2.1	3,281
Rv	Razito Variant, very hard	0.7	0.7	3,538
Sc	Shiprock	3.8	3.6	30,355
Sh	Shiprock, very hard	4.7	4.4	37,944

A total of 27 soil profiles were described in the LBE/NJM. The soil type, northing, easting, depth of suitable topdressing, and depth to bedrock are listed for each location (Appendix B). The results from laboratory analysis for sampled profiles are given in Appendix C, and soil profile descriptions for the 27 test-pit sites are presented in Appendix D.

A total of 488,883 yds³ of suitable topdressing was identified in the LBE/NJM. This volume was reduced by 20 percent to account for experienced losses during the removal and redistribution of topdressing material. Therefore, the volume of suitable topdressing material available for reclamation from the LBE/NJM is estimated to be 391,106 yds³. Assuming that the entire 107 acre area is disturbed, as a result of mining operations, approximately 27 inches of topdressing will be available for redistribution during the reclamation of the area.



References

Fenneman, N.M. 1983. Physiography of the Western United States. McGraw-Hill, New York, New York.

Soil Survey Division Staff. 1993. Soil Survey Manual. USDA Handbook No. 18. U.S Gov. Print. Office, Washington, D.C.

USDA. Nat. Res. Conserv. Serv. Soil Survey Staff, 1996. National Soils Handbook, Washington, D.C.

Appendix A
Area and Volume of Available Topdressing
for each Soil Map Unit Delineation in the
Lowe Boxcut Exchange Area,
Navajo Mine



Appendix A. Area and volume of available topdressing for each soil map unit delineation in the Lowe Boxcut Exchange Area, Navajo Mine.

Map Unit Delineation	Depth of Topdressing	Acreage	Volume (cu. yds.)
Bc-1	60.0	1.6	13129
Bh-1	51.0	8.5	58203
Bh-2	20.0	2.4	6332
Bh-3	49.0	18.3	120265
Bh-4	60.0	3.2	25551
Jh-1	58.0	5.9	45751
Ma-1	60.0	2.5	19969
Ms-1	60.0	6.2	49743
Nt-1	0.0	0.5	0
Nt-2	0.0	0.1	0
Nt-3	0.0	2.0	0
Nt-4	0.0	5.9	0
Nt-5	0.0	0.3	0
Nt-6	0.0	0.1	0
Nt-7	0.0	7.2	0
Nt-8	0.0	0.2	0
Nt-9	0.0	8.5	0
Nt-10	0.0	12.9	0
Ra-1	60.0	9.2	74348
Ra-2	43.0	0.1	474
Rh-1	11.0	2.2	3281
Rv-1	39.0	0.7	3538
Sc-1	60.0	3.8	30355
Sh-1	60.0	4.7	37944

Appendix B
Northing, Easting, Depth of Topdressing,
and Depth to Bedrock for Each Soil Survey Site
Located in the Lowe Boxcut Exchange Area,
Navajo Mine



Appendix B. Northing, easting, depth of topdressing, and depth to bedrock for each soil survey site located in the Lowe Boxcut Exchange Area, Navajo Mine.

Site Number	Soil Type	Easting	Northing	Topdressing Depth (in.)	Bedrock Depth (in.)
1	Sh	304606.2	2014848.7	60+	60+
2	Nt	304549.8	2015271.5	0	60+
3	Nt	304577.5	2015792.6	0	60+
4	Nt	304807.3	2015977.9	0	60+
5	Bh	304609.3	2016263.7	60+	60+
6	Nt	304630.0	2016792.8	0	60+
7	Bc	304788.3	2017310.8	60+	60+
8	Bc	304576.5	2017288.1	60+	60+
11	Ms	304604.0	2019457.0	60+	60+
12	Bh	304579.9	2019802.1	20	60+
13	Nt	304682.7	2020129.5	0	60+
14	Rh	304365.5	2020008.1	0	0
15	Rh	304466.1	2020362.6	22	60+
16	Nt	304720.2	2020499.4	0	60+
17	Bh	304534.5	2017952.4	27	60+
18	Nt	304691.1	2018945.1	0	48+
19	Jc	304413.9	2020880.7	55	55
20	Sh	304647.5	2021116.7	60+	60+
21	Jh	304377.6	2021399.8	60+	60+
22	Ms	304266.6	2021532.3	60+	60+
23	Ms	303921.7	2021504.1	60+	60+
24	Ra	303975.9	2021770.8	60+	60+
25	Ra	303384.0	2021633.0	60+	60+
26	Bc	303400.7	2021481.0	60+	60+
27	Bh	303109.5	2021786.5	42	60+
28	Bc	303130.6	2022566.4	60+	60+
29	Bc	303454.0	2022256.8	60+	60+

Appendix C
Lowe Boxcut Exchange
Laboratory Data





InterMountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

BHP Minerals - Navajo Mine

Fruitland, NM

IML Project #0300S02104

Client Project ID: Topdressing

Low / Dixon Baseline Topdressing

Report Date: 06/12/00

Date Received: 05/23/00

Lab Id	Sample Id	Depths Inch	pH	EC	Saturation	Ca	Mg	Na	SAR	Sand	Silt	Clay	Texture USDA	CaCO3
			s.u.	mmhos/cm	%	meq/L	meq/L	meq/L		%	%	%	%	
0300S02104	#5	16 - 35	7.6	5.90	41	28	2.2	51	13	61	12	27	SCL	2.4
0300S02105	#5	35 - 42	7.8	2.09	41	3.6	0.39	21	15	65	11	24	SCL	2.8
0300S02106	#6	2 - 19	7.9	3.21	38	3.8	0.29	32	22	69	12	19	SL	2.7
0300S02107	#12	5 - 20	7.9	1.16	44	1.4	0.32	11	12	55	17	28	SCL	3.6
0300S02108	#12	20 - 60	7.7	8.66	33	24	3.8	85	23	77	9	14	SL	3.7
0300S02109	#21	9 - 40	7.7	1.84	36	6.4	0.63	13	6.7	67	13	20	SCL	3.6
0300S02110	#29	10 - 24	7.7	1.23	46	1.8	0.24	11	11	55	15	30	SCL	5.6
0300S02111	#29	24 - 60	7.6	3.05	36	9.1	0.98	24	11	71	7	22	SCL	1.5



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

Page 2 of 6

BHP Minerals - Navajo Mine

Fruitland, NM

IML Project #0300S02104

Client Project ID: Topdressing

Date Received: 05/23/00

Low / Dixon Baseline Topdressing

Report Date: 06/12/00

Lab Id	Sample Id	Depths Inch	Total Sulfur %	AcidBase Total S t/kt	Neutral. Potential t/kt	ABP Total S t/kt
0300S02104	#5	16 - 35	0.44	13.8	26.8	13.0
0300S02105	#5	35 - 42	0.04	1.3	27.5	26.3
0300S02106	#6	2 - 19	0.04	1.3	28.6	27.4
0300S02107	#12	5 - 20	0.03	0.9	36.6	35.6
0300S02108	#12	20 - 60	0.24	7.5	37.3	29.8
0300S02109	#21	9 - 40	0.01	0.3	36.5	36.2
0300S02110	#29	10 - 24	0.02	0.6	55.0	54.4
0300S02111	#29	24 - 60	0.04	1.3	17.7	16.5



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

Page 3 of 6

BHP Minerals - Navajo Mine

Fruitland, NM

IML Project #0300S02104

Client Project ID: Topdressing

Date Received: 05/23/00

Low / Dixon Baseline Topdressing

Report Date: 06/12/00

Lab Id	Sample Id	Depths Inch	Boron Soluble mg/Kg	Selenium Total mg/Kg	Selenium Soluble mg/Kg
0300S02104	#5	16 - 35	1.6	0.40	<0.02
0300S02105	#5	35 - 42	0.9	<0.25	<0.02
0300S02106	#6	2 - 19	1.5	0.30	<0.02
0300S02107	#12	5 - 20	0.9	<0.25	<0.02
0300S02108	#12	20 - 60	1.4	0.30	<0.02
0300S02109	#21	9 - 40	0.6	<0.25	<0.02
0300S02110	#29	10 - 24	1.2	0.30	<0.02
0300S02111	#29	24 - 60	1.0	0.25	0.02



Inter-Mountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

Page 4 of 6

BHP Minerals - Navajo Mine

Fruitland, NM

Low / Dixon Baseline Topdressing

Client Project ID: Topdressing

Date Received: 05/23/00

IML Project #0300S02104

Report Date: 06/12/00

Lab Id	Sample Id	Depths Inch	pH	EC	Saturation	Ca	Mg	Na	SAR	Sand	Silt	Clay	Texture USDA	CaCO3
			s.u.	mmhos/cm	%	meq/L	meq/L	meq/L		%	%	%		%
0300S02107	#12	5 - 20	7.9	1.16	44	1.4	0.32	11	12	55	17	28	SCL	3.6
0300S02107D	#12	5 - 20	7.9	1.28	44	1.4	0.32	11	12	55	17	28	SCL	3.7



InterMountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

Page 5 of 6

BHP Minerals - Navajo Mine

Fruitland, NM

IML Project #0300S02104

Client Project ID: Topdressing

Low / Dixon Baseline Topdressing

Report Date: 06/12/00

Date Received: 05/23/00

Lab Id	Sample Id	Depths Inch	Total Sulfur %	AcidBase Total S t/kt	Neutral. Potential t/kt	ABP Total S t/kt
0300S02107	#12	5 - 20	0.03	0.9	36.6	35.6
0300S02107D	#12	5 - 20	0.03	0.9	37.8	36.9



InterMountain Laboratories, Inc.

2506 West Main Street

Farmington, New Mexico 87401

Tel. (505) 326-4737

Page 6 of 6

BHP Minerals - Navajo Mine

Fruitland, NM

Client Project ID: Topdressing

Date Received: 05/23/00

Low / Dixon Baseline Topdressing

IML Project #0300S02104

Report Date: 06/12/00

Lab Id	Sample Id	Depths Inch	Boron Soluble mg/Kg	Selenium Total mg/Kg	Selenium Soluble mg/Kg
0300S02107	#12	5 - 20	0.9	<0.25	<0.02
0300S02107D	#12	5 - 20	0.9	<0.25	<0.02

Appendix D
Soil Profile Descriptions



Soil Description

Soil Type **BLANCOT** File No. _____

Area **D. DUJE / DIXON BASELINE** Date **05/23/00** Stop No. **28**

Classification **sublucry Hapleryid** **EP / BAB**

Location _____

N. veg. (or crop) **SPCR, H. ja, ATOB, SAIB** Climate _____

Parent Material **Alluvium**

Physiography **Terrace**

Relief _____ Drainage _____ Salt or Alkali _____

Elevation _____ Gr. Water _____ Stoniness _____

Slope **0-1** Moisture _____

Aspect _____ Root distrib. _____

Erosion **slight**

Permeability _____

Additional notes: _____

Samples (depth inches) **All Suitable**

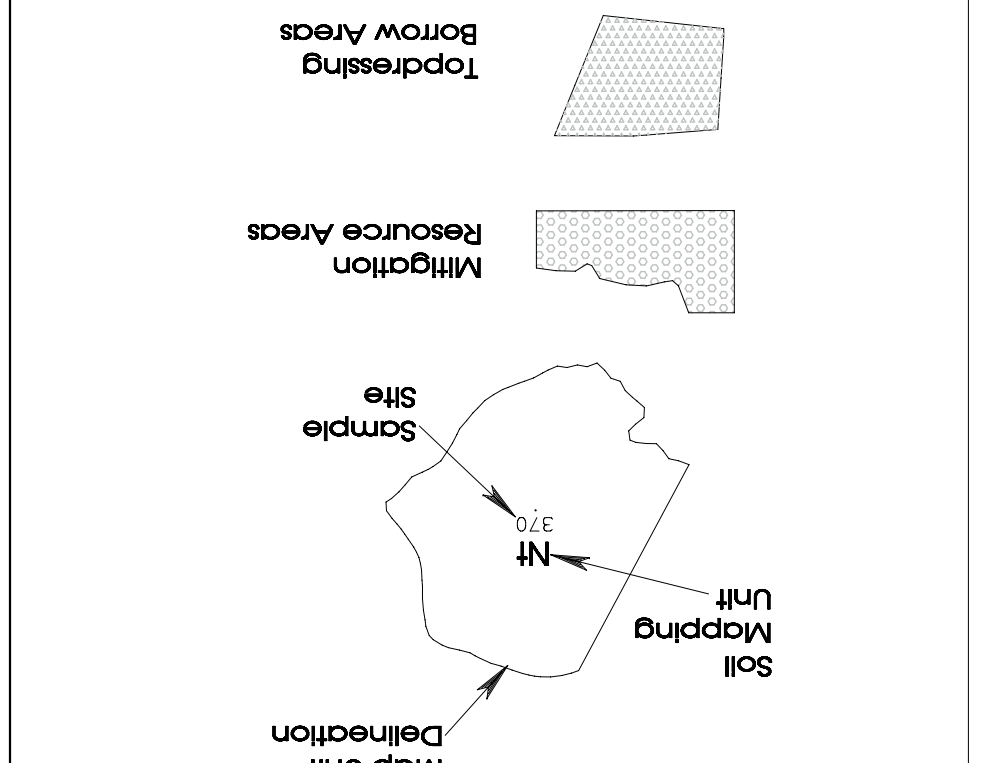
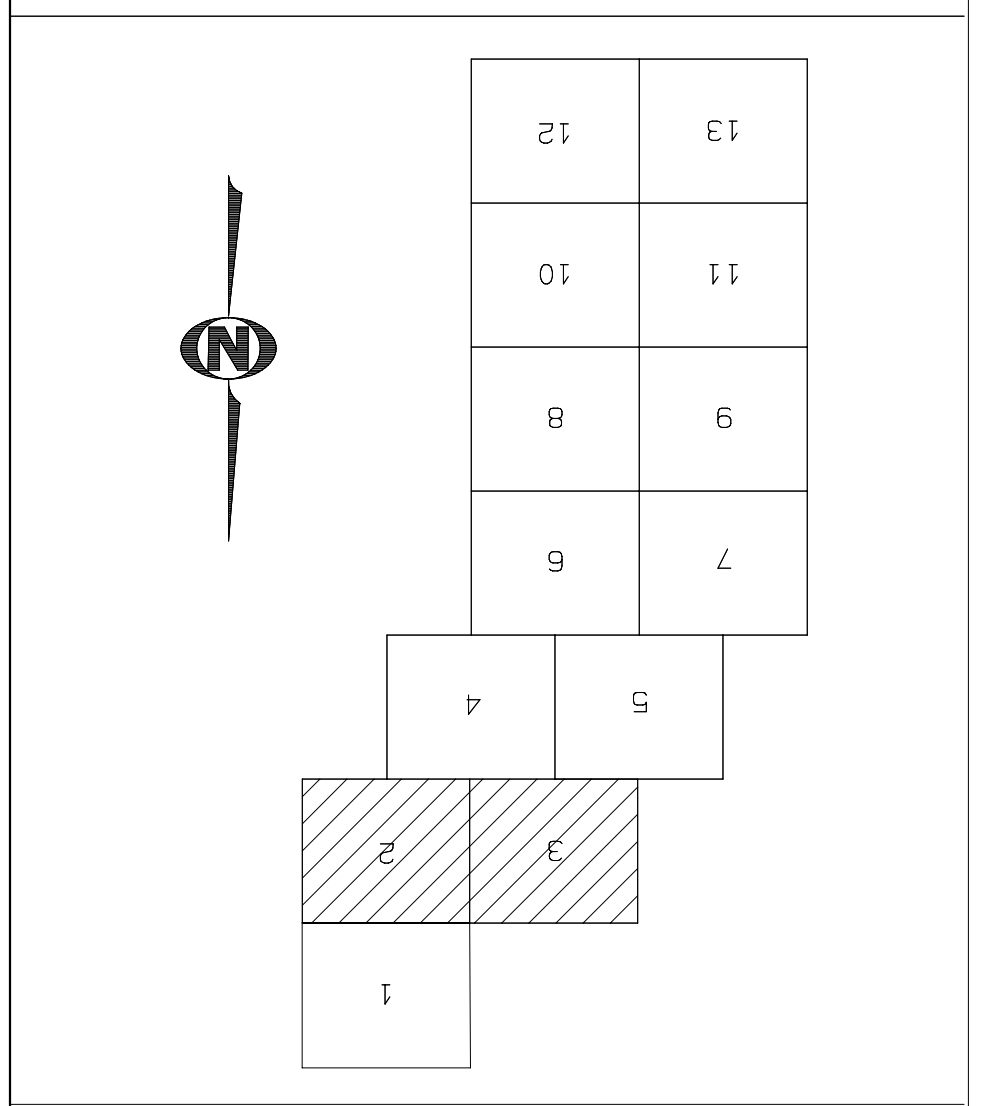
Typic Blancot with SL/SCL surface

Horizon	Depth	Color		Texture	Structure	Consistence			pH Reaction	Boundary		
		Dry	Moist			Dry	Moist	Wet				
A	0-8			Sc1	WSBK	sh			eo			
Bt	8-21			Sc1 Cl	sp	vh			es			
C1	21-45			sl	m	h			eo			
C2	45-52			cl	m	vh			es1			
C3	52-60			Sc1	m	h			eo			

inches
Pit Depth (60)
Bedrock (60+)
Topsoil (60)

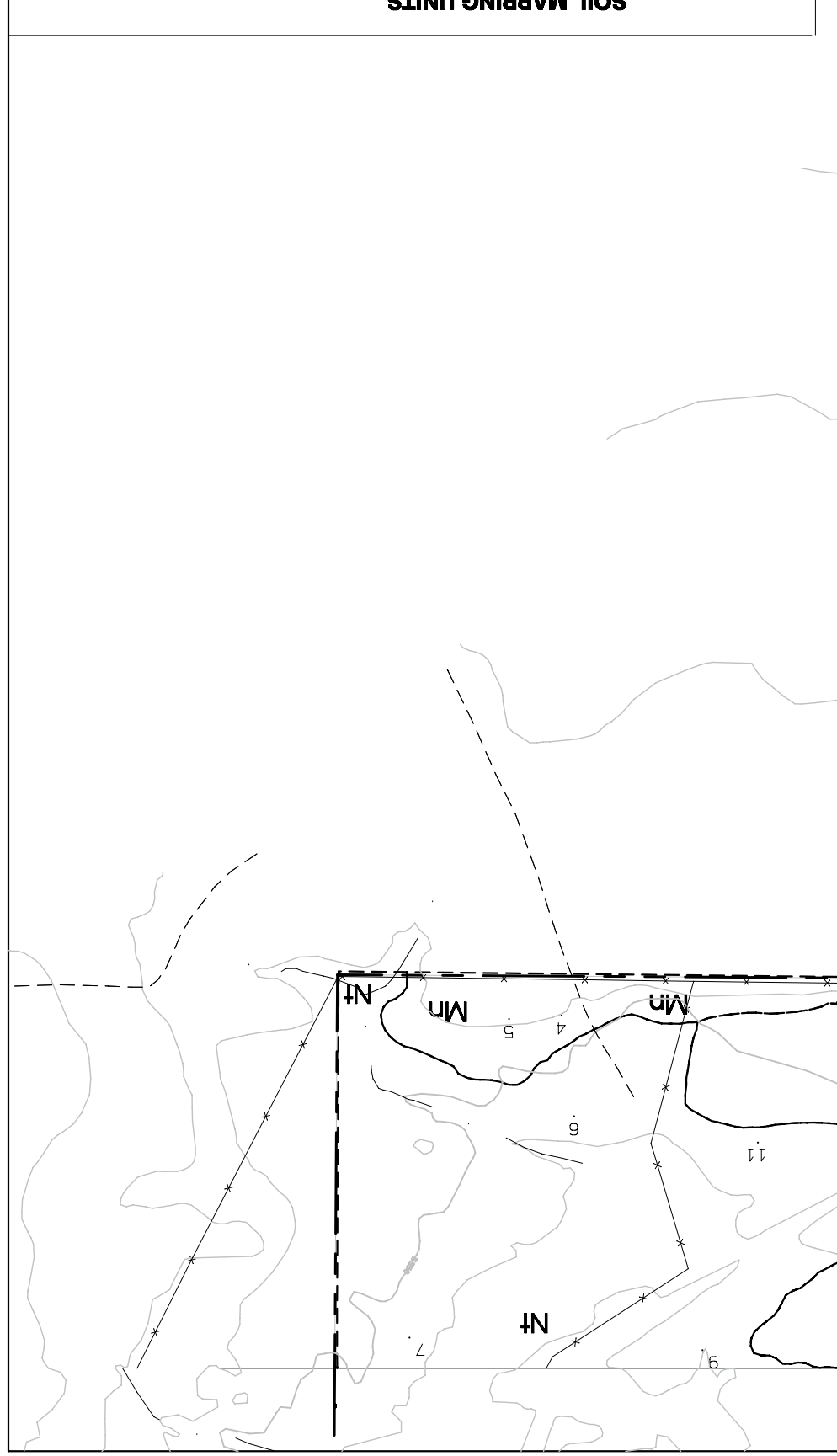
NO.	DATE	BY	REVISION
1	11-20-06	JK	SOILS RECORDS UNIT NEW OPEN LETTERS SHOWN
2	01-19-06	JK	ADDED NEW RECORDS TO SOILS RECORDS TO OPEN
3	02-02-06	JK	ADDED NEW RECORDS AND SCHEDULE

EXHIBIT 8-1, 2 of 7
 BHP NAVAJO COAL COMPANY
 P. O. BOX 1717, FULTON, NEW MEXICO 87416
 PREPARED BY: P. J. P
 SCALE: 1" = 500'
 APPROVED BY: [Signature]
 DATE: JULY 20, 2006
 SHEET 2 OF 7



SOIL MAPPING UNITS

Ba	Badlands
Bc	Balcob and Montero
Bd	Balcob, very hard
Dst	Disturbed Areas
Fq	Fair and Peralta
Gr	Gravel
Jc	Locally, very hard
Md	Mud
Mk	Mucky
Mq	Mucky-queen
Mv	Mucky-queen-shiprock, very hard
Nk	Naked
Nl	Natural
Nv	Natural, overgrown
Rd	Road
Ra	Roadbed Areas
Rn	Road, very hard
Rv	Roadbed, very hard
Sc	Shiprock
Sh	Shiprock, very hard
Sl	Shiprock-blancet
Sr	Shiprock, variant
Sz	Shrub
Ta	Trail
Tv	Trail, very hard
Ts	Topsoil Stockpile



LEGEND

---	PERMIT BOUNDARY
-.-.-	LEASE CORNER
▲ 5422.45	HORIZ. & VERT. CONTROL
~	INTERMEDIATE CONTOUR
~	INDEX CONTOUR
• 5329.5	SPOT ELEVATION
—•—	POWERLINE
○	TREES
— — —	RAILROAD
— — —	DRAINAGE
— — —	DAM
— — —	CULVERT
— — —	IRRIGATION LINE
— — —	FENCE
— — —	BUILDING
— — —	TRAIL
— — —	HAUL ROAD
— — —	DIRT ROAD
— — —	PAVED ROAD

Match Line see Exhibit 8-1, 1 of 7

Match Line see Exhibit 8-1, 3 of 7

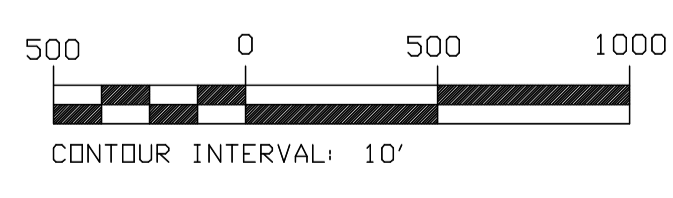
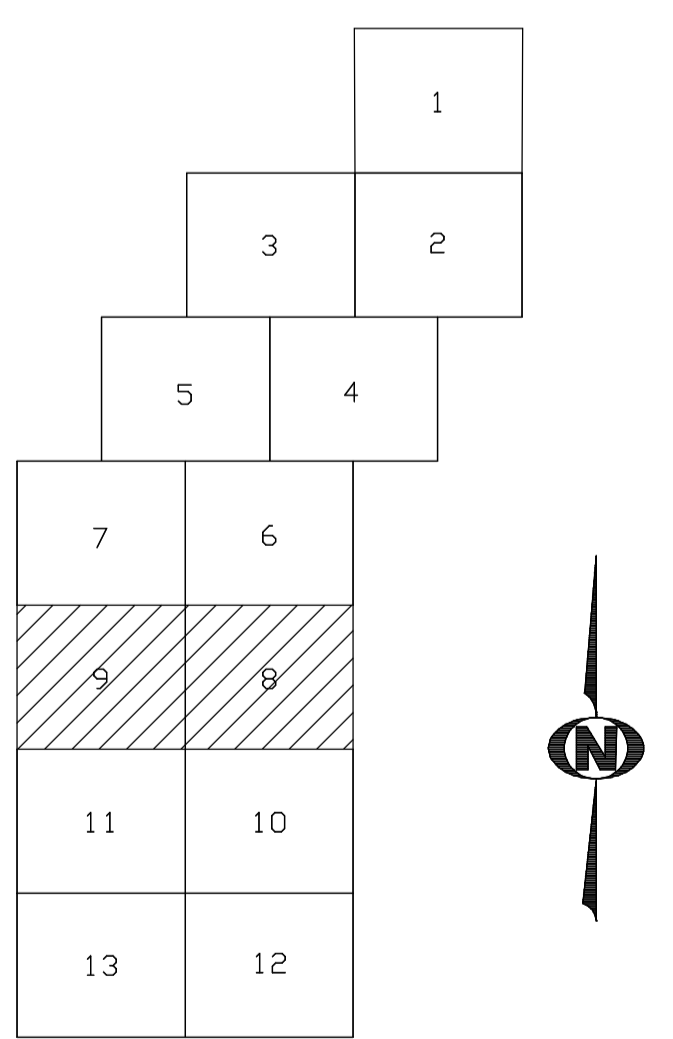
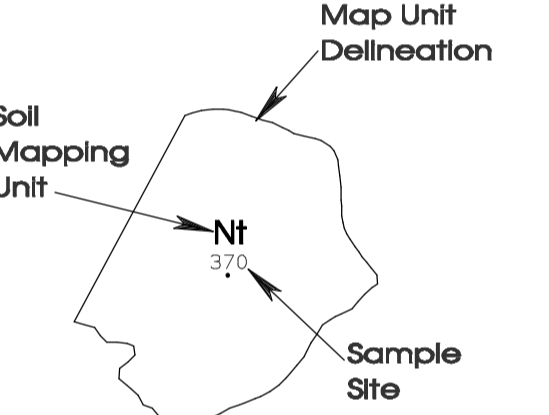
Match Line see Exhibit B-1, 4 of 7

LEGEND

- PAVED ROAD
- DIRT ROAD
- HAUL ROAD
- TRAIL
- BUILDING
- FENCE
- IRRIGATION LINE
- CULVERT
- DAM
- DRAINAGE
- RAILROAD
- TREES
- POWERLINE
- SPOT ELEVATION
x 5338.5
- INDEX CONTOUR
5300
- INTERMEDIATE CONTOUR
- HORIZ. & VERT. CONTROL
219
5422.45
- LEASE CORNER
L-30
- PERMIT BOUNDARY

SOIL MAPPING UNITS

- Ba Badlands
- Bd Bacobi and Monierco
- Bc Blanco
- Bh Blanco, very hard
- Dst Disturbed Areas
- Fa Fats and Pensayo
- Gr Grieta
- Jc Jochy-Gilco
- Jh Jochy, very hard
- Ma Mack
- Mn Mayqueen
- Ms Mayqueen-Shiprock
- Mv Mayqueen-Shiprock, very hard
- Na Nakal
- Nt Natargids
- Nv Natargids, overblown
- Pnd Ponds
- Ra Razito
- Rcl Reclaimed Areas
- Rh Razito, very hard
- Ri Redlands Variant
- Rv Redlands Variant, very hard
- Sc Shiprock
- Sh Shiprock, very hard
- Sl Shiprock-Blanco
- Sv Shiprock Variant
- Sz Stumble
- Ta Trail
- Th Trail, very hard
- Ts Topsoil Stockpile



NO.	DATE	BY	REVISION DESCRIPTION	SCALE	DATE	BY	APPROVAL
1	7-12-08	FJF	ADDED ONE EASTSIDE OF LINE PER AND SUBMITTED TO DDP FOR REVIEW.	1" = 500'			
2	7-18-08	FJF	REVISED AND REVISITED SOILS RESOURCES TO DATE (LETTER DATED 5/24/08)	1" = 500'			
3	7-21-08	FJF	SOILS RESOURCES UPDATE PER DDP LETTER DATED 5/24/08	1" = 500'			

EXHIBIT B-1

BHP NAVAJO COAL COMPANY

P. O. BOX 1717 FRUITLAND, NEW MEXICO 87416

DETAILED SOILS MAP
AREA - III

PREPARED BY: [Signature] DRAWN BY: FJF SCALE: 1" = 500'
 APPROVED BY: [Signature] DATE: JULY 20, 2008 SHEET 6 OF 7
 PATH: C:\DRAFTING\2008\188 DATA\09\EXHIBIT B-1, 4-7, 5-7, 188.dwg

C:\DRAFTING\2008\188 DATA\09\EXHIBIT B-1, 4-7, 5-7, 188.dwg

PREPARED BY: **SKANSKA** SCALE: 1" = 500'

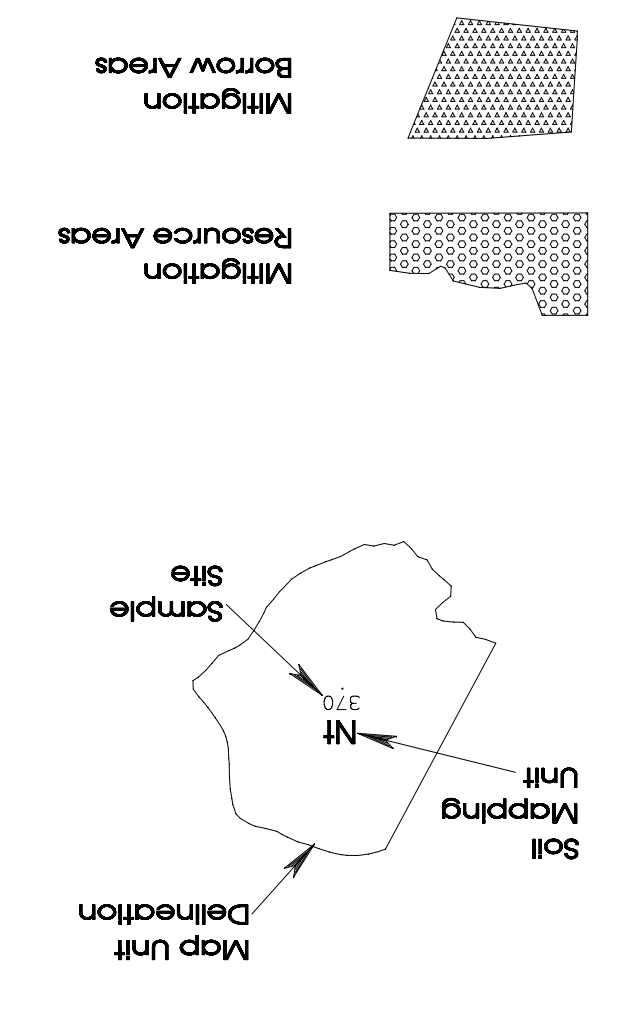
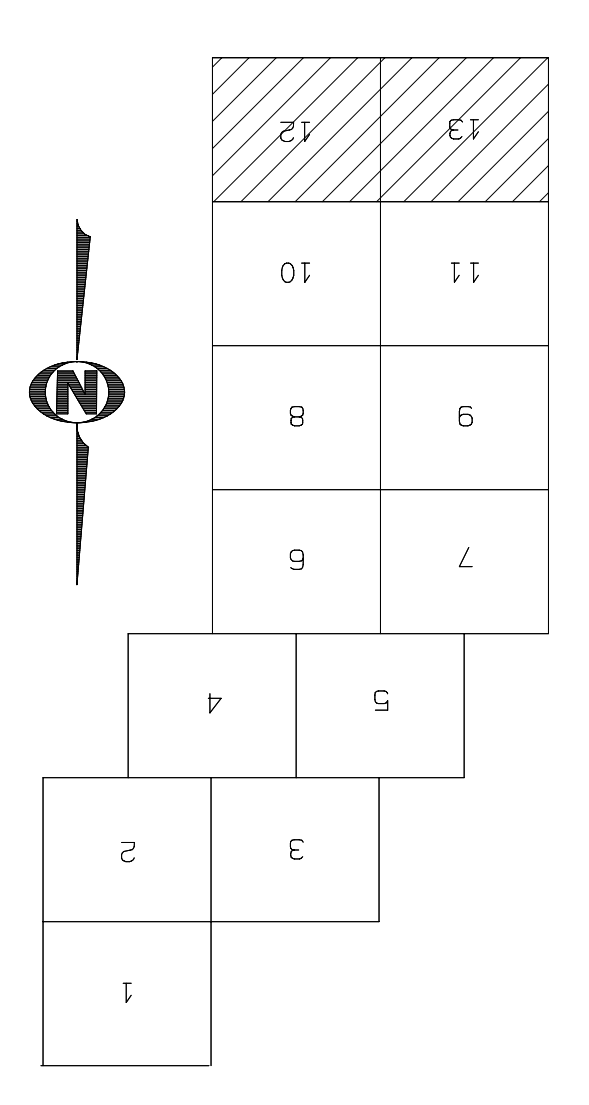
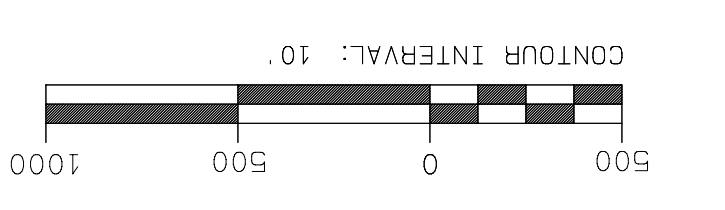
APPROVED BY: **DATE: JULY 20, 2006 SHEET 7 OF 7**

AREA - IV NORTH

BHP NAVAJO COAL COMPANY

EXHIBIT 8-1

NO.	DATE	BY	REVISION
1	7-21-06	SK	ISSUED FOR CONSTRUCTION PERMITS
2	7-21-06	SK	ISSUED FOR CONSTRUCTION PERMITS



- SOIL MAPPING UNITS**
- Ba Balcón Mojave
 - Bd Balcón and Pecos
 - Bn Balcón, very hard
 - Bc Balcón
 - Bt Balcón, very hard
 - Dst Disturbed Areas
 - Fo Fols and Pecos
 - Gr Gravel
 - Jc Jochy, gice
 - Jh Jochy, very hard
 - Ma Mack
 - Mn Mayaguez
 - Ms Mayaguez-shippock
 - Mv Mayaguez-shippock, very hard
 - Nc Nacá
 - Nf Nofregids
 - Nv Nofregids, overblow
 - Pnd Ponds
 - Ra Rallo
 - Rd Rallo, very hard
 - Rh Rallo, very hard
 - Rv Rallo, very hard, very hard
 - Sc Shippock
 - Sh Shippock, very hard
 - Sn Shippock-shippock
 - Sv Shippock-Voront
 - Sr Shippock
 - Ta Tall, very hard
 - Ts Topsoil Shippock

- LEGEND**
- PAVED ROAD
 - DIRT ROAD
 - HAUL ROAD
 - TRAIL
 - BUILDINGS
 - FENCE
 - IRRIGATION LINE
 - CULVERT
 - DAM
 - DRAINAGE
 - RAILROAD
 - TREES
 - POWERLINE
 - SPT ELEVATION
 - INDEX CONTOUR
 - INTERMEDIATE CONTOUR
 - HORIZ. & VERT. CONTROL
 - LEASE CORNER
 - PERMIT BOUNDARY

