APPENDIX A

Soil Descriptions for the Proposed Project Area

Summary of the Physical Characteristics of Individual Soil Mapping Units Encountered in the HQPA [1]

Soil Map Unit #	Soil Map Unit Name	Slope Phase	Road Length	Soil Series	Land Capability [5] Non-Irrigated	Land Capability [5] Irrigated [6]	Soil Depth	Available Water Capacity	Permeability	Erosion Factor T [7]	Wind Erodibility [8] Group	Wind Erodibility [8] Index
95	Forkwood-Cambria Loams	0 to 6%	1,523'	45% Forkwood loam	3*e*	NR	very deep	high	moderate	5	5	56
				35% Cambria loam	4*e*	NR	very deep	high	moderate	5	5	56
110	Hiland-Bowbac Fine Sandy Loams	6 to 15%	609'	45% Hiland fine sandy loam	4*e*	NR	very deep	moderate	moderate	5	3	86
				35% Bowbac fine sandy loam	4*e*	NR	moderately deep	low	moderately slow	3	3	86
123	Kishona-Cambria Loams	0 to 6%	2,335'	45% Kishona clay loam	4*e*	NR	very deep	high	moderate	5	4L	86
				40% Cambria loam	4*e*	NR	very deep	high	moderate	5	5	56
168	Shingle-Taluce Badland Complex	10 to 40%	2,031'	30% Shingle clay loam	6*e*	NR	shallow	very low	very slow	2	4L	86
				25% Taluce fine sandy loam	6*e*	NR	shallow	very low	moderately slow	2	3	86
				20% Badland [3]	8	NR	shallow	high	very slow	---	---	---
182	Theedle-Kishona-Shingle Loams	3 to 20%	2,742'	35% Theedle loam	4*e*	NR	moderately deep	low	moderately slow	3	4L	86
				25% Kishona clay loam	4*e*	NR	very deep	high	moderate	5	4L	86
				20% Shingle clay loam	6*e*	NR	shallow	very low	very slow	2	4L	86
222	Theedle-Kishona Loams	6 to 15%	200'	45% Theedle loam	4*e*	NR	moderately deep	low	moderately slow	3	4L	86
				35% Kishona clay loam	4*e*	NR	very deep	high	moderate	5	4L	86
224	Tyzak-Rock Outcrop Complex [2]	6 to 70%	1,170'	50% Tyzak channery loam	7*e*	NR	shallow	very low	very slow	1	8	0
				50% Rock Outcrop [4]	NR	NR	---	---	---	---	---	---

[1] Information obtained from *Non-Technical Soil Description, Soil Survey WY609, Converse County Area, Wyoming, Southern Part.* Unpublished Report. United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (2003).

[2] Both the ten acre (Proposed Action) and forty acre (Alternative A) quarry sites are located within Soil Map Unit 224: Tyzak-Rock Outcrop Complex.

[3] Badland - Weathered bedrock at the surface to a depth of 60 inches or more.

[4] Rock Outcrop - Unweathered bedrock at the surface to a depth of 60 inches or more.

[5] Refer to the definitions of Land Capability on the following pages.

[6] NR = Not Rated.

[7] Refer to the definitions for Erosion Factor T on the following pages.

[8] Refer to the definitions for Wind Erodibility on the following pages.

CAPABILITY CLASSES are Designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, with Class I soils having few limitations and Class VIII soils having multiple limitations that prevent commercial crop production.

The capability classes are defined as follows:

- Class I soils have few limitations that restrict their use.

- Class II soils have some limitations that reduce the choice of plants or that require moderate conservation practices.

- Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices or both.

- Class IV soils have very severe limitations that restrict the choice of plants, require very careful management, or both.

- Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

- Class VI soils have severe limitations that make them generally unsuitable for cultivation.

- Class VII soils have very severe limitations that make them unsuitable for cultivation.

- Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example II*e*. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

EROSION FACTOR T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year. Soil loss (Erosion Factor) T is assigned according to properties of root limiting subsurface sol layers. The designation of a limiting layer implies that the material above the layer has more favorable plant growth properties. As limiting or less favorable soil layers become closer to the surface, the relative ability of a soil to maintain its productivity through natural and managed processes decreases. Criteria for assigning "T" are estimated from:

1. The severity of physical or chemical properties of subsurface layers.
2. The climatically influenced properties of soil moisture and temperature.
3. The economic feasibility of utilizing management practices to overcome limiting layers or conditions.

Erosion Factor "T" is expressed as soil loss tolerance in tons/acre based upon the depth to the limiting layer in inches as follows:

0 - 10 inches = 1 ton/acre	40 - 60 inches = 4 tons/acre
10 - 20 inches = 2 tons/acre	} 60 inches = 5 tons/acre
20 - 40 inches = 3 tons/acre	

WIND ERODIBILITY GROUPS are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

The WIND ERODIBILITY INDEX is used in the wind erosion equation (WEQ). The index number indicates the amount of soil lost in tons per acre per year. The range of wind erodibility index numbers is 0 to 300.