PacifiCorp

Deer Creek Mine

C/015/0018

Clean Copy Submittal
Soil Sampling Information

R645-301-200: Soils
Replace Entire Section (Seven Clean Copies)

File in:
☐ Confidential
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☒ Expandable
Refer to Record No 0051 Date 071307
In C/015/0018 Incoming

240. Reclamation Plan (R645-301-200)

R645-301-242 Soil Redistribution

At the time of reclamation, PacifiCorp will reduce the footprint of the Deer Creek mine site disturbed area by redistributing soil and spoil material to be consistent with the post mining land use and water drainage system. This will be accomplished by cutting and/or filling the existing mine site footprint in each of the three (3) disturbed canyons; Deer Creek Canyon, Deer Canyon, and Elk Canyon. These areas will be re-contoured as outlined on Drawings DS-1781-D through DS-1784-D in **Appendix R645-301-500-C**.

Deer Creek was developed prior to the Surface Mining Control Reclamation Act and topsoil/subsoil material was never segregated or stockpiled during construction activities. The native soils on steep slopes in the disturbed area provide very little topsoil material. Nowhere in the vicinity of the mine is there a source of material that would usually be referred to as "topsoil". Since it would be impractical and very costly to transport other suitable material to the site, the existing fill material must be examined to determine its suitability for vegetal growth.

The soil materials in the existing fill were originally derived from sandstone and shale parent materials from the terraced area on the south side of Deer Creek Canyon. Soil sampling of this area was conducted in 1999. Eighteen (18) samples were taken and analyzed for the parameters described in Table 6 of the *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining* (Leatherwood, 1988). A sample location map of the terrace sampling is included in **Appendix R645-301-200- B**.

The soil material particles are mostly sand with textures from sandy clay loams to loamy sands. The water holding capacity is low, typical of sandy soils. They are calcareous soils as indicated in pH's of 7.5 – 8.5 and calcium carbonate equivalents above 8%. Salt content is too low for any harmful affects on plants. Potassium, phosphate and nitrogen, important plant nutrients, are very low indicating the need for fertilization to insure plant growth. The organic material throughout the disturbed area is principally coal debris. Percentage nitrogen is very low. For a more detailed discussion on soil type, characteristics, and quality, refer to **Volume 2, Chapter 2**.

Track-hoes, rubber tired backhoes, dozers and front-end loaders will be used to recontour the disturbed area. Travel over redistributed soil material will be minimized to the extent possible. This will be accomplished by reclaiming the mine in specific sequences, utilizing existing roads and travelways to live haul substitute soil material. It is important to understand that while reclamation will be specifically sequenced, various stages will be occurring simultaneously throughout the site. During the field season of 2002, a soil sampling program was implemented (refer to Table 3-1 Reclamation Schedule for implementation of program) to determine the quality of substitute topsoil

available for reclamation and to determine if refuse material is toxic- and/or acid-forming. Substitute topsoil must be used since no soil had been previously stockpiled for reclamation purposes. Quality of the topsoil will be analyzed to determine the suitability for revegetation success. Sampling locations and procedures are described below in complete detail.

As recontouring of an area is completed and available topsoil is redistributed, it will be fertilized, mulched, then roughened by deep gouging (pocking) with a trackhoe bucket or similar equipment that produces a depression approximately 3.0' dia. x 1.5' deep. These depressions will be developed throughout the reclaimed area and will influence the retention of moisture and greatly reduce sediment contributions to stream flow.

R645-301-233 Topsoil Substitutes and Supplements

According to the cut and fill mass balance calculations in the Engineering Section, sufficient soil materials (topsoil and subsoil) are available to reclaim the Deer Creek Mine. The anticipated topsoil placement locations are illustrated on Drawing DS-1816-D in **Appendix R645-301-500-C**. The cut and fill calculations in R645-301-500 assume that suitable soil in substantial quantity is located within the corridor of the undisturbed drainage.

To provide a suitable topsoil material for reclamation purposes, soils were sampled in 2002 as outlined on Map DS-1810-D in **R645-301-200-B**, the analytical results are found in Appendix R645-301-200A (refer to Table 3-1 Reclamation Schedule for implementation of program). Sample points were randomly placed along the corridor of the existing undisturbed drainage culvert and taken at three foot depth intervals to a point four feet below the grade of the proposed final surface configuration. Samples were collected by Energy West staff members qualified in collecting soil samples. The information required for by R645-301-130 was submitted with the technical data

The samples were analyzed at Intermountain Laboratory Inc. where quality was determined using the soil suitability criteria of Table 2, *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mines*, Leatherwood and Duce, 1988. The soil sample analysis results have been incorporated into **Appendix R645-301-200-A** of this section. Representative samples (site #1 and site #6; DS-1810-D) were also sampled in conjunction with the slope stability study in the spring of 2000. The description of this study is found in **Appendix R645-301-500-E** of the MRP. The sample analyses for these sites are also included in **Appendix R645-301-200-A**.

As shown in the analysis results, the substitute topsoil sampled within the corridor in 2002 was not suitable because of the high sodium content. Sodium Adsorption Ratio's (SAR's) in the upper portions of the soil profile were higher than 15. Those soils found in excess of an SAR value greater than 15 are considered unacceptable according the Guidelines. Therefore, to continue to rely on the cut/fill reclamation plan as described and to ensure an adequate quality of suitable substitute topsoil and soil cover for reclamation, Energy West commits to resample the substitute topsoil above the

buried culvert and analyze for Electrical Conductivity and SAR values (and, if necessary, based on item 2 below, analyze for CEC and ESP) once within each permit term, until such time as the soils are found acceptable for substitute topsoil use. Soils found unacceptable at the time of reclamation due to their high sodium content, will be 1) buried in the fill with at least 4 feet of non-toxic material, or 2) reclaimed through the use of amendments, prior to placement on the surface of the reclamation site.

In order to provide the substitute topsoil and soil cover analyses prior to permit renewal in January 2012, an individual, qualified to conduct soil sampling will:

1) Provide field notes, surveyed map locations, and sampling of the following:

a) Disturbed soils to provide a baseline for comparison of salt values. The native soils will be sampled by horizon down to lithic contact.

b) Resample the proposed substitute topsoil locations above the buried culvert to provide an indication of the extent of salt loading in the surface 0-3 feet along the roadway and/or to show that the salt is leaching out of the surface three feet over time. The Permittee will find a site accessible by backhoe at one of these locations, such that the qualified individual can resample to greater depth at three foot increments.

2) Direct the laboratory that if, in any of the above samples, the Sodium Adsorption Ratio (SAR) values are greater than 15, an analysis of total Cation Exchange Capacity (CEC) and Exchangeable Sodium Percentage (ESP), will be required, such that a calculation of the gypsum requirement can be made.

3) Formulate the soil amendment and fertilization plan for reclamation.

In addition to the pre-reclamation sampling program, PacifiCorp commits to conducting field sampling during the reclamation project. Sampling will be conducted by random examination of the sub-material used to construct final reclamation contours prior to placement of substitute topsoil material. A paste pH and EC evaluation will be conducted at all selected sites. The Division will be notified of the results of the evaluation. Table 2 in the *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mines* will be used to accept or reject this material.

Underground Development Wastes.

The refuse material cut during topographic contouring will be used as fill along cut banks and highwalls. Before recontouring begins, however, a complete sampling program of the refuse piles needs to be implemented so the chemical characteristics can be known. Any acid- and/or toxic-forming refuse fill material found will be covered with four (4) feet non-acid and/or non-toxic

forming material. This will be accomplished by one or both of the following methods; 1) excavating a pit to bury the toxic soil material on-site and/or 2) sacrifice non-toxic substitute topsoil covering from certain areas of the mine site to cover the toxic soil material. The soil sampling program will identify problem areas throughout the mine site.

Partial sampling of the underground development waste (refuse) piles located in Deer Creek and Elk canyons was previously conducted (April 2000) in cooperation with the slope stability investigation. Two samples (Site #1 and Site # 6; **Appendix R645-301-200-A**) were taken to determine if the refuse material was acid or toxic forming or could be used as a suitable subsoil substitute. The sample analysis found that SAR's were elevated near the surface in each of the two samples taken. Heavy salting of travel areas during the winter months is most likely the contributing factor. Additional sampling of these refuse piles was conducted in conjunction with the substitute topsoil material sampling and described below. The addition sample analyses is found in **Appendix R645-301-200-A** . Sampling procedures are outlined below.

Sampling Procedures for Refuse Piles

Sampling was conducted while performing slope stability investigations (June, 2000) on the slopes of the refuse piles. Test holes were drilled with a rotary rig using water as the drilling fluid and a rock bit with drive casing to advance the holes through the overburden. Sampling was performed at three- to five-foot intervals in the overburden throughout the depth investigated. Both disturbed and undisturbed samples were obtained during field investigations. Disturbed samples were obtained by driving a 2-inch split spoon sampling tube through a distance of 18 inches using a 140-pound weight dropped for a distance of 30 inches.

Undisturbed samples were obtained by pushing a thin-walled sampling tube into the subsurface material using the hydraulic pressure on the drill rig. The location at which the undisturbed samples were obtained are shown on the boring logs in **Appendix R645-301-500-E** and on map DS-1810-D in **Appendix R645-301-200-B**. The document provided in this appendix was assembled by RB&G Engineering Consultants.

Once the samples were analyzed for stability properties, the remnant sample for each site was sent to Intermountain Laboratories for quality analysis. The parameters described in Table 6 of the *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining* (Leatherwood, 1988) were analyzed. Results of the analysis can be reviewed in **Appendix R645-301-200-A**.

To provide sufficient subsoil materials for reclamation purposes, refuse materials throughout the site were examined. Sampling was conducted in conjunction with the substitute topsoil sampling program during the 2002 field season. Samples of the material were taken in the

confines of the refuse piles in the Deer Creek and Elk canyons as well as in the mine site facility areas. Sample points were placed randomly in these areas and taken at various depth intervals to a point four feet below the final grade of the proposed final surface configuration. Samples were collected by Energy West staff members qualified in collecting soil samples. The requirements of R645-301-131 were followed. Sampling details and results have been incorporated in **Appendix R645-301-200-A**.

R645-301-243: Soil Nutrients and Amendments (Refer to **R645-301-300: Biology**)

R645-301-244: Soil Stabilization (Also refer to **R645-301-500: Engineering** for slope stability analysis)

Various sized rocks and boulders (litter) will be randomly placed on slopes of reclaimed areas where feasible or helpful to control slope slippage and to promote microhabitats. Mid-sized litter material will be placed on the prepared slopes and nested into the soil at random locations. This process will provide a natural esthetic appearance as well as slope containment.

Where it is deemed necessary, especially on slopes greater than 20%, a soil tackifier (refer to **R645-301-300: Biology**, Seeding Techniques) will be incorporated into the reclamation process to stabilize soil material.

Rills and gullies, which develop in areas that have been regraded and topsoiled and which either; 1) disrupts the approved post mining land use or the reestablishment of the vegetative cover, or 2) causes or contributes to the violation of water quality standards for receiving streams will be filled, regraded, or otherwise stabilized.

PacifiCorp

Deer Creek Mine

C/015/0018

Clean Copy Submittal, Task ID 2748
Soil Sampling Information

Sampling Field Data / Laboratory Results
Add to end of R645-301-200 Soils, Appendix A (Seven Clean Copies)

Deer Creek Soil Sampling Program - Field Data
October thru November 2002

Sample ID	Date	Location	Use*	Hole #	Depth (ft.)	Color (Dry)	Color (Wet)	Field pH	Field EC (uS)
DC1902	10/18/2002	Elk Cyn Coal Bin (old wrs)	B	1	0-8	10YR 3/1 DARK GRAY	10YR 2/1 BLACK	9.53	206
DC2002	10/18/2002	Elk Cyn Coal Bin (old wrs)	B	1	8-13	2.5Y 5/1 GRAY	2.5Y 3/1 VERY DARK GRAY	9.48	261
DC2102	10/18/2002	Elk Cyn Coal Bin Access (old wrs)	B	2	0-10	2.5Y 5/1 GRAY	2.5Y 3/1 VERY DARK GRAY	8.81	2080
DC2202	10/18/2002	Elk Cyn Coal Bin Access (old wrs)	B	2	10-16	10YR 6/1 GRAY	10YR 3/1 VERY DARK GRAY	9.21	1590
DC2302	10/18/2002	Deer Creek Cyn Storage Yard (old wrs)	B	5	0-5	10YR 5/1 GRAY	10YR 4/1 DARK GRAY	9.93	525
DC2402	10/18/2002	Deer Creek Cyn Storage Yard (old wrs)	B	5	5-10	10YR 6/1 GRAY	10YR 4/2 DARK GRAY BROWN	9.53	1037
DC2502	10/18/2002	Deer Creek Cyn Storage Yard (old wrs)	B	5	10-15	10YR 6/1 GRAY	10YR 4/2 DARK GRAY BROWN	9.63	833
DC2602	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	0-5	10YR 4/1 DARK GRAY	10YR 2/1 BLACK	9.37	702
DC2702	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	5-10	10YR 5/1 GRAY	10YR 2/1 BLACK	11.65	1500
DC2802	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	10-15	10YR 4/1 DARK GRAY	10YR 2/1 BLACK	10.78	971
DC2902	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	15-20	10YR 4/1 DARK GRAY	10YR 2/1 BLACK	10.09	927
DC3002	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	20-25	10YR 5/1 GRAY	10YR 2/2 VERY DARK BROWN	9.7	997
DC3102	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	25-30	10YR 5/1 GRAY	10YR 4/2 DARK GRAY BROWN	9.67	1001
DC3202	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	30-35	10YR 4/1 DARK GRAY	10YR 3/2 VERY DARK GRAY BROWN	9.47	1310
DC3302	10/18/2002	Deer Creek Cyn Storage Yard (outslope of old wrs)	B	6	35-40	10YR 6/1 GRAY	10YR 3/2 VERY DARK GRAY BROWN	9.59	1170
DC3402	10/18/2002	Deer Creek Cyn Storage Yard	B	7	0-6	10YR 5/4 YELLOWISH BROWN	10YR 5/3 BROWN	9.25	2770
DC3502	10/18/2002	Deer Creek Cyn Storage Yard	B	7	6-11	10YR 6/4 LIGHT YELLOWISH BROWN	10YR 5/4 YELLOWISH BROWN	8.58	4340
DC3602	10/18/2002	Deer Creek Cyn Storage Yard	B	7	11-16	10YR 4/4 DARK YELLOWISH BROWN	10YR 3/4 DARK YELLOWISH BROWN	8.72	2590
DC3702	10/18/2002	Deer Creek Cyn Parking Lot	B	8	0-5	10YR 6/3 PALE BROWN	10YR 4/2 DARK GRAY BROWN	9.73	1970
DC3802	10/18/2002	Deer Creek Cyn Parking Lot	B	8	5-10	7.5 YR 6/4 LIGHT BROWN	7.5 YR 4/4 BROWN	8.94	2710
DC3902	10/18/2002	Deer Creek Cyn Parking Lot	B	8	10-15	10YR 6/3 PALE BROWN	10YR 4/3 BROWN	8.95	2170
DC4002	10/18/2002	Deer Creek Cyn Warehouse Area	B	9	0-4	10YR 6/3 PALE BROWN	10YR 3/2 VERY DARK GRAY BROWN	8.65	1055
DC4102	10/18/2002	Deer Creek Cyn Warehouse Area	B	9	4-8	10YR 6/3 PALE BROWN	10YR 4/3 BROWN	9.14	1680
DC4202	10/18/2002	Deer Creek Cyn Fan Access Road	A	11	0-8	10YR 5/3 BROWN	10YR 4/2 DARK GRAY BROWN	10.27	4400
DC4302	10/18/2002	Deer Creek Cyn Fan Access Road	A	11	8-13	10YR 6/2 LIGHT BROWN GRAY	10YR 4/2 DARK GRAY BROWN	8.69	929
DC4402	10/18/2002	Deer Creek Cyn Fan Access Road	A	11	13-16.5	2.5Y 8/1 WHITE	2.5Y 7/2 LIGHT GRAY	8.95	673
DC4502	10/18/2002	Deer Creek Cyn Fan Access Road	A	11	16.5-22	2.5Y 8/1 WHITE	2.5Y 7/2 LIGHT GRAY	9.47	317
DC4602	10/18/2002	Deer Creek Cyn Fan Access Road	A	12	0-8	10YR 6/3 PALE BROWN	10YR 4/3 BROWN	8.68	11500
DC4702	10/18/2002	Deer Creek Cyn Fan Access Road	A	12	8-13	10YR 6/2 LIGHT BROWN GRAY	10YR 4/3 BROWN	9.17	3640
DC4802	10/18/2002	Deer Creek Cyn Fan Access Road	A	12	13-18	2.5Y 7/2 LIGHT GRAY	2.5Y 6/2 LIGHT BROWN GRAY	8.99	2290
DC4902	10/18/2002	Deer Creek Cyn Shop Area		10	0-8	10YR 5/2 GRAY BROWN	10YR 3/2 VERY DARK GRAY BROWN	9.97	413
DC5002	11/13/2002	Deer Creek Cyn Main Access Road Area	A	3	0-3	5YR 3/1 VERY DARK GRAY	5YR 3/1 VERY DARK GRAY	6.5	1662
DC5102	11/13/2002	Deer Creek Cyn Main Access Road Area	A	3	3-6	5YR 3/1 VERY DARK GRAY	5YR 3/1 VERY DARK GRAY	6.79	2930
DC5202	11/13/2002	Deer Creek Cyn Main Access Road Area	A	3	6-9	5YR 2.5/1 BLACK	5YR 2.5/1 BLACK	6.81	3220
DC5302	11/13/2002	Deer Creek Cyn Main Access Road Area	A	3	9-12	5YR 4/1 DARK GRAY	5YR 4/1 DARK GRAY	6.83	1842
DC5402	11/13/2002	Deer Creek Cyn Main Access Road Area	A	4	0-3	5YR 4/1 DARK GRAY	5YR 4/1 DARK GRAY	6.82	3300
DC5502	11/13/2002	Deer Creek Cyn Main Access Road Area	A	4	3-6	5YR 3/1 VERY DARK GRAY	5YR 3/1 VERY DARK GRAY	6.9	3970
DC5602	11/13/2002	Deer Creek Cyn Main Access Road Area	A	4	6-8	5YR 3/1 VERY DARK GRAY	5YR 3/1 VERY DARK GRAY	6.9	3930

* - This column notes whether the sample was analyzed for subsoil (acid and/or toxic forming characteristics) or substitute topsoil.
The letter "A" denotes substitute topsoil and the letter "B" denotes subsoil.

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

Report ID: 010223411

Soil Analysis Report
Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	Depth (Ft.)	pH	Saturation	EC @ 25°C	Calcium	Magnesium	Sodium	SAR
				s.u.	%	mmhos/cm	meq/L	meq/L	meq/L	
0102S23411	DC1902	1	0 - 8	7.3	25.1	1.90	9.32	9.54	3.69	1.20
0102S23412	DC2002	1	8 - 13	7.1	22.8	2.38	17.6	14.6	3.96	0.99
0102S23413	DC2102	2	0 - 10	7.5	28.2	5.06	20.1	50.5	12.0	2.02
0102S23414	DC2202	2	10 - 16	7.7	28.6	5.47	24.2	45.8	17.0	2.88
0102S23415	DC2302	5	0 - 5	8.2	23.6	5.02	16.5	12.9	31.1	8.13
0102S23416	DC2402	5	5 - 10	7.8	25.1	5.53	5.28	27.2	38.7	9.60
0102S23417	DC2502	5	10 - 15	7.9	26.7	5.56	12.1	27.0	39.7	8.98
0102S23418	DC2602	6	0 - 5	7.1	24.1	6.35	28.8	31.1	26.6	4.86
0102S23419	DC2702	6	5 - 10	9.0	26.4	5.09	38.8	1.19	19.8	4.43
0102S23420	DC2802	6	10 - 15	8.6	30.4	4.77	36.4	4.25	21.8	4.83
0102S23421	DC2902	6	15 - 20	8.2	29.2	5.83	27.5	17.7	25.7	5.41
0102S23422	DC3002	6	20 - 25	8.1	29.5	5.04	12.8	15.7	36.3	9.62
0102S23423	DC3102	6	25 - 30	8.0	29.8	5.71	9.92	12.0	51.8	15.6
0102S23424	DC3202	6	30 - 35	7.9	29.3	7.65	10.6	10.3	68.8	21.3
0102S23425	DC3302	6	35 - 40	8.0	31.6	7.01	8.88	10.6	57.0	18.2
0102S23426	DC3402	7	0 - 6	8.2	33.0	17.7	28.8	17.8	148	30.5

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: BB
Rena Bradley, Assistant Soil Lab Supervisor

nter·Mou[redacted] Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

eport ID: 010223411

Soil Analysis Report
Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar
02S23411	DC1902	1	5.1	66.0	22.0	12.0	SANDY LOAM	7.4	4.6
02S23412	DC2002	1	6.8	50.0	38.0	12.0	LOAM	9.2	4.2
02S23413	DC2102	2	7.0	46.0	36.0	18.0	LOAM	14.7	7.3
102S23414	DC2202	2	3.9	56.0	25.0	19.0	SANDY LOAM	13.3	6.9
102S23415	DC2302	5	11.8	62.0	24.0	14.0	SANDY LOAM	9.5	4.5
102S23416	DC2402	5	7.8	54.0	30.0	16.0	SANDY LOAM	9.0	5.9
102S23417	DC2502	5	5.7	51.0	32.0	17.0	LOAM	12.2	8.3
102S23418	DC2602	6	18.5	52.0	30.0	18.0	SANDY LOAM	10.7	7.2
102S23419	DC2702	6	20.2	57.0	31.0	12.0	SANDY LOAM	13.1	8.2
0102S23420	DC2802	6	16.5	54.0	30.0	16.0	SANDY LOAM	13.3	8.3
0102S23421	DC2902	6	28.2	56.0	32.0	12.0	SANDY LOAM	12.3	7.7
0102S23422	DC3002	6	9.3	51.0	33.0	16.0	LOAM	12.1	7.3
0102S23423	DC3102	6	6.1	46.0	38.0	16.0	LOAM	12.1	7.3
0102S23424	DC3202	6	1.3	53.0	31.0	16.0	SANDY LOAM	11.3	7.1
0102S23425	DC3302	6	0.7	38.0	46.0	16.0	LOAM	15.8	8.3
0102S23426	DC3402	7	14.2	40.0	38.0	22.0	LOAM	15.1	8.5

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: RB
Rena Bradley, Assistant Soil Lab Supervisor

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

Report ID: 010223411

Soil Analysis Report

Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	TOC %	Total Sulfur %	T.S. AB t/1000t	Neutral. Pot. t/1000t	T.S. ABP t/1000t	TKN %	Boron ppm	Nitrogen Nitrate ppm	Selenium ppm	Available Sodium meq/100g	Exchangeable Sodium meq/100g
0102S23411	DC1902	1	14.6	0.15	4.69	215	211	0.24	1.21	0.96	<0.02	0.18	0.09
0102S23412	DC2002	1	7.6	0.10	3.12	256	252	0.11	0.76	1.20	<0.02	0.14	0.05
0102S23413	DC2102	2	6.8	0.36	11.2	411	400	0.13	0.85	16.5	0.06	0.65	0.31
0102S23414	DC2202	2	17.2	0.49	15.3	357	342	0.20	1.12	20.4	0.04	0.77	0.28
0102S23415	DC2302	5	4.6	0.07	2.19	358	355	0.08	0.79	0.96	<0.02	1.47	0.73
0102S23416	DC2402	5	1.2	0.03	0.94	415	414	0.03	0.40	1.84	0.02	1.67	0.70
0102S23417	DC2502	5	1.9	0.05	1.56	329	327	0.04	0.97	0.88	0.02	1.59	0.53
0102S23418	DC2602	6	6.2	0.02	0.62	384	383	0.11	1.24	3.56	0.04	1.13	0.49
0102S23419	DC2702	6	7.5	0.17	5.31	396	390	0.14	0.77	1.76	0.04	1.01	0.49
0102S23420	DC2802	6	8.5	0.02	0.62	335	335	0.16	1.19	2.84	0.04	1.14	0.48
0102S23421	DC2902	6	6.3	0.11	3.44	318	315	0.14	1.14	2.76	0.02	1.26	0.51
0102S23422	DC3002	6	3.8	0.13	4.06	286	281	0.07	1.14	2.14	0.02	1.78	0.71
0102S23423	DC3102	6	3.7	<0.01	0.00	240	240	0.08	0.79	0.78	0.02	2.51	0.97
0102S23424	DC3202	6	5.2	0.12	3.75	240	237	0.06	0.66	1.86	<0.02	2.99	0.98
0102S23425	DC3302	6	3.4	0.18	5.62	230	224	0.05	0.77	0.48	0.02	2.76	0.96
0102S23426	DC3402	7	0.8	0.05	1.56	372	370	0.04	1.16	0.28	0.02	6.39	1.52

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: Rena Bradley, Assistant Soil Lab Supervisor

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

Report ID: 010223411

Soil Analysis Report
Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	Depth (ft.)	pH s.u.	Saturation %	EC @ 25°C mmhos/cm	Calcium meq/L	Magnesium meq/L	Sodium meq/L	SAR
0102S23427	DC3502	7	6-11	7.8	36.3	18.2	21.6	41.3	138	24.5
0102S23428	DC3602	7	11-16	7.8	34.9	11.8	21.3	76.1	54.9	7.86
0102S23429	DC3702	8	0-5	8.6	27.5	9.14	4.80	4.91	96.0	43.6
0102S23430	DC3802	8	5-10	7.9	32.5	12.2	9.75	26.0	105	24.8
0102S23431	DC3902	8	10-15	7.8	30.1	9.72	11.2	28.5	77.2	17.3
0102S23432	DC4002	9	0-4	8.6	29.1	19.1	43.7	4.41	179	36.6
0102S23433	DC4102	9	4-8	7.5	26.3	9.32	12.3	29.5	70.5	15.4
0102S23434	DC4202	11	0-8	7.5	31.5	4.00	7.56	12.1	23.7	7.56
0102S23435	DC4302	11	8-13	7.2	23.5	4.63	11.6	15.6	23.3	6.31
0102S23436	DC4402	11	13-16.5	7.6	24.2	3.13	5.62	13.3	14.0	4.57
0102S23437	DC4502	11	16.5-22	7.6	23.9	2.67	3.50	9.71	8.08	3.14
0102S23438	DC4602	12	0-8	7.8	24.3	31.4	12.9	13.3	367	101
0102S23439	DC4702	12	8-13	7.5	25.7	19.4	19.2	15.0	190	46.0
0102S23440	DC4802	12	13-18	7.6	26.2	10.9	12.9	14.2	97.5	26.5
0102S23441	DC4902	10	0-8	7.9	32.2	7.62	7.67	8.02	67.4	24.1
0102S23442	DC5002	3	0-3	7.6	32.6	10.6	19.8	31.0	87.7	17.4

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By:

Rena Bradley, Assistant Soil Lab Supervisor

nter·Mour[redacted] Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

Report ID: 010223411

Soil Analysis Report

Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar
102S23427	DC3502	7	2.1	29.0	45.0	26.0	LOAM	20.2	9.1
102S23428	DC3602	7	2.3	32.0	46.0	22.0	LOAM	19.0	7.6
102S23429	DC3702	8	11.0	44.0	36.0	20.0	LOAM	18.1	7.2
102S23430	DC3802	8	1.3	33.0	44.0	23.0	LOAM	18.4	7.6
102S23431	DC3902	8	<0.5	40.0	38.0	22.0	LOAM	17.1	7.0
102S23432	DC4002	9	9.8	50.0	28.0	22.0	SANDY CLAY LOAM	19.1	7.3
102S23433	DC4102	9	4.2	52.0	32.0	16.0	SANDY LOAM	18.5	6.7
102S23434	DC4202	11	1.2	44.0	36.0	20.0	LOAM	19.4	6.8
102S23435	DC4302	11	2.0	58.0	26.0	16.0	SANDY LOAM	12.2	4.1
102S23436	DC4402	11	<0.5	44.0	44.0	12.0	LOAM	17.5	2.4
102S23437	DC4502	11	<0.5	42.0	47.0	11.0	LOAM	18.2	2.1
0102S23438	DC4602	12	41.8	56.0	30.0	14.0	SANDY LOAM	14.1	4.8
0102S23439	DC4702	12	8.6	54.0	30.0	16.0	SANDY LOAM	14.8	5.1
0102S23440	DC4802	12	0.9	47.0	37.0	16.0	LOAM		
0102S23441	DC4902	10	6.1	45.0	37.0	18.0	LOAM	19.8	6.4
0102S23442	DC5002	3	51.6	44.0	34.0	22.0	LOAM	16.3	8.0

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
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Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: RB
Rena Bradley, Assistant Soil Lab Supervisor

nter·Mou[redacted]Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

eport ID: 010223411

Soil Analysis Report

Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	TOC	Total Sulfur	T.S. AB	Neutral. Pot.	T.S. ABP	TKN	Boron	Nitrogen Nitrate	Selenium	Available Sodium	Exchangeable Sodium
			%	%	t/1000t	t/1000t	t/1000t	%	ppm	ppm	ppm	meq/100g	meq/100g
02S23427	DC3502	7	0.8	0.03	0.94	374	373	0.04	0.69	0.20	0.02	7.26	2.26
102S23428	DC3602	7	0.5	0.01	0.31	410	410	0.03	0.50	0.42	0.02	2.64	0.72
102S23429	DC3702	8	2.2	<0.01	0.00	373	373	0.04	0.83	0.34	<0.02	4.96	2.32
102S23430	DC3802	8	0.6	0.01	0.31	376	376	0.02	0.46	0.26	<0.02	5.09	1.68
102S23431	DC3902	8	0.6	0.02	0.62	446	445	0.02	0.40	1.26	0.02	3.30	0.98
102S23432	DC4002	9	0.9	0.03	0.94	389	388	0.03	1.03	6.34	0.02	8.44	3.22
102S23433	DC4102	9	2.5	0.01	0.31	362	361	0.03	0.59	0.60	<0.02	2.93	1.08
102S23434	DC4202	11	0.6	0.02	0.62	299	299	0.07	0.41	6.12	<0.02	1.32	0.57
102S23435	DC4302	11	1.0	0.02	0.62	295	294	0.02	0.26	5.82	<0.02	0.87	0.32
0102S23436	DC4402	11	<0.1	0.01	0.31	289	289	0.01	0.11	1.66	<0.02	0.44	0.10
0102S23437	DC4502	11	<0.1	0.01	0.31	272	272	0.01	0.07	0.90	<0.02	0.27	0.08
0102S23438	DC4602	12	0.3	0.03	0.94	274	273	0.03	0.39	3.70	<0.02	13.2	4.31
0102S23439	DC4702	12	0.6	0.02	0.62	369	368	0.03	0.21	1.74	<0.02	7.48	2.59
0102S23440	DC4802	12	0.2	0.02	0.62	352	352	0.02	0.17	2.14	<0.02	4.28	1.73
0102S23441	DC4902	10	2.7	0.04	1.25	317	316	0.05	1.46	0.46	<0.02	3.90	1.73
0102S23442	DC5002	3	3.3	0.05	1.56	319	317	0.09	0.87	1.66	0.02	4.74	1.88

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By:

Rena Bradley, Assistant Soil Lab Supervisor

nter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

Report ID: 010223411

Soil Analysis Report
Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	Depth (ft)	pH s.u.	Saturation %	EC @ 25°C mmhos/cm	Calcium meq/L	Magnesium meq/L	Sodium meq/L	SAR
0102S23443	DC5102	3	3-6	7.4	26.2	10.9	10.4	12.6	115	33.9
0102S23444	DC5202	3	6-9	7.4	36.5	10.9	15.7	46.1	79.5	14.3
0102S23445	DC5302	3	9-12	7.6	32.0	7.40	11.6	24.4	55.5	13.1
0102S23446	DC5402	4	0-3	7.6	27.3	21.7	10.6	7.49	242	80.6
0102S23447	DC5502	4	3-6	7.6	34.0	10.8	16.7	34.0	73.5	14.6
0102S23448	DC5602	4	6-8	7.7	31.0	20.8	19.0	16.6	206	48.8

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: RB
Rena Bradley, Assistant Soil Lab Supervisor

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

Report ID: 010223411

Soil Analysis Report
Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar %
102S23443	DC5102	3	55.5	50.0	31.2	18.8	LOAM	15.7	7.6
102S23444	DC5202	3	42.3	48.0	32.0	20.0	LOAM	20.1	10.0
102S23445	DC5302	3	46.8	45.0	32.5	22.5	LOAM	17.2	8.4
102S23446	DC5402	4	50.0	56.0	28.0	16.0	SANDY LOAM	13.9	6.5
102S23447	DC5502	4	40.6	48.0	32.0	20.0	LOAM	18.2	8.1
102S23448	DC5602	4	47.8	54.0	28.0	18.0	SANDY LOAM	16.6	8.1

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By:

Rena Bradley, Assistant Soil Lab Supervisor

nter·Mountain Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

eport ID: 010223411

Soil Analysis Report
Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	TOC %	Total Sulfur %	T.S. AB t/1000t	Neutral. Pot. t/1000t	T.S. ABP t/1000t	TKN %	Boron ppm	Nitrogen Nitrate ppm	Selenium ppm	Available Sodium meq/100g	Exchangeable Sodium meq/100g
02S23443	DC5102	3	9.5	0.09	2.81	266	264	0.10	1.11	6.98	<0.02	9.44	6.43
102S23444	DC5202	3	2.1	<0.01	0.00	356	356	0.06	0.97	13.2	0.02	5.22	2.32
102S23445	DC5302	3	2.6	0.02	0.62	337	336	0.05	1.51	4.16	<0.02	3.98	2.20
102S23446	DC5402	4	3.2	0.05	1.56	284	283	0.04	0.86	3.80	<0.02	10.8	4.21
102S23447	DC5502	4	<0.1	0.03	0.94	321	320	0.08	17.4	<0.02	0.02	4.52	2.02
102S23448	DC5602	4	10.4	0.11	3.44	288	285	0.07	1.19	7.24	<0.02	10.2	3.84

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: BB
Rena Bradley, Assistant Soil Lab Supervisor

nter·Mou[redacted]Laboratories, Inc.

1633 Terra Avenue
Sheridan, WY 82801

eport ID: 010223411

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Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
Date Received: 11/21/02

Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	pH	Saturation	EC @ 25°C	Calcium	Magnesium	Sodium	SAR
			s.u.	%	mmhos/cm	meq/L	meq/L	meq/L	
02S23431	DC3902	8	7.8	30.1	9.72	11.2	28.5	77.2	17.3
02S23431D	DC3902	8	7.8	28.9	9.76	11.7	29.1	79.9	17.7
102S23440	DC4802	12	7.6	26.2	10.9	12.9	14.2	97.5	26.5
102S23440D	DC4802	12	7.6	26.0	10.7	12.7	12.9	97.2	27.2
102S23443	DC5102	3	7.4	26.2	10.9	10.4	12.6	115	33.9
102S23443D	DC5102	3	7.4	27.2	11.5	9.90	10.8	115	35.7
102S23445	DC5302	3	7.6	32.0	7.40	11.6	24.4	55.5	13.1
102S23445D	DC5302	3	7.6	30.4	7.33	11.1	23.4	54.8	13.2

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
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Reviewed By: RB
Rena Bradley, Assistant Soil Lab Supervisor

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lient Project ID: Deer Creek Mine
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Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar %
02S23431	DC3902	8	<0.5	40.0	38.0	22.0	LOAM	17.1	7.0
02S23431D	DC3902	8		38.0	40.0	22.0	LOAM		
02S23440	DC4802	12	0.9	47.0	37.0	16.0	LOAM		
02S23440D	DC4802	12		45.0	39.0	16.0	LOAM		
02S23443	DC5102	3	55.5	50.0	31.2	18.8	LOAM	15.7	7.6
02S23443D	DC5102	3		52.5	30.0	17.5	SANDY LOAM		
02S23445	DC5302	3	46.8	45.0	32.5	22.5	LOAM	17.2	8.4
02S23445D	DC5302	3		43.8	33.7	22.5	LOAM		

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By:
Rena Bradley, Assistant Soil Lab Supervisor

Inter-Mountain Laboratories, Inc.

1633 Terra Avenue
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Report ID: 010223411

Soil Analysis Report
Energy West Mining Co.
P.O. Box 310
Huntington, UT 84528

Client Project ID: Deer Creek Mine
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Set #0102S23411
Report Date: 03/06/03

Lab Id	Sample Id	Hole #	TOC %	Total Sulfur %	T.S. AB t/1000t	Neutral. Pot. t/1000t	T.S. ABP t/1000t	TKN %	Boron ppm	Nitrogen Nitrate ppm	Selenium ppm	Available Sodium meq/100g	Exchangeable Sodium meq/100g
0102S23431	DC3902	8	0.6	0.02	0.62	446	445	0.02	0.40	1.26	0.02	3.30	0.98
0102S23431D	DC3902	8	0.7	0.02	0.62	439	439	0.03	0.44	1.18	<0.02	3.28	0.97
0102S23440	DC4802	12	0.2	0.02	0.62	352	352	0.02	0.17	2.14	<0.02	4.28	1.73
0102S23440D	DC4802	12	0.5	0.02	0.62	353	352	0.02	0.16	2.06	<0.02	4.31	1.78
0102S23443	DC5102	3	9.5	0.09	2.81	266	264	0.10	1.11	6.98	<0.02	9.44	6.43
0102S23443D	DC5102	3	8.7	0.09	2.81	270	268	0.08	1.17	7.18	<0.02	9.74	6.61
0102S23445	DC5302	3	2.6	0.02	0.62	337	336	0.05	1.51	4.16	<0.02	3.98	2.20
0102S23445D	DC5302	3	2.2	0.02	0.62	346	346	0.06	1.45	3.80	<0.02	3.83	2.16

These results only apply to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By:

Rena Bradley, Assistant Soil Lab Supervisor

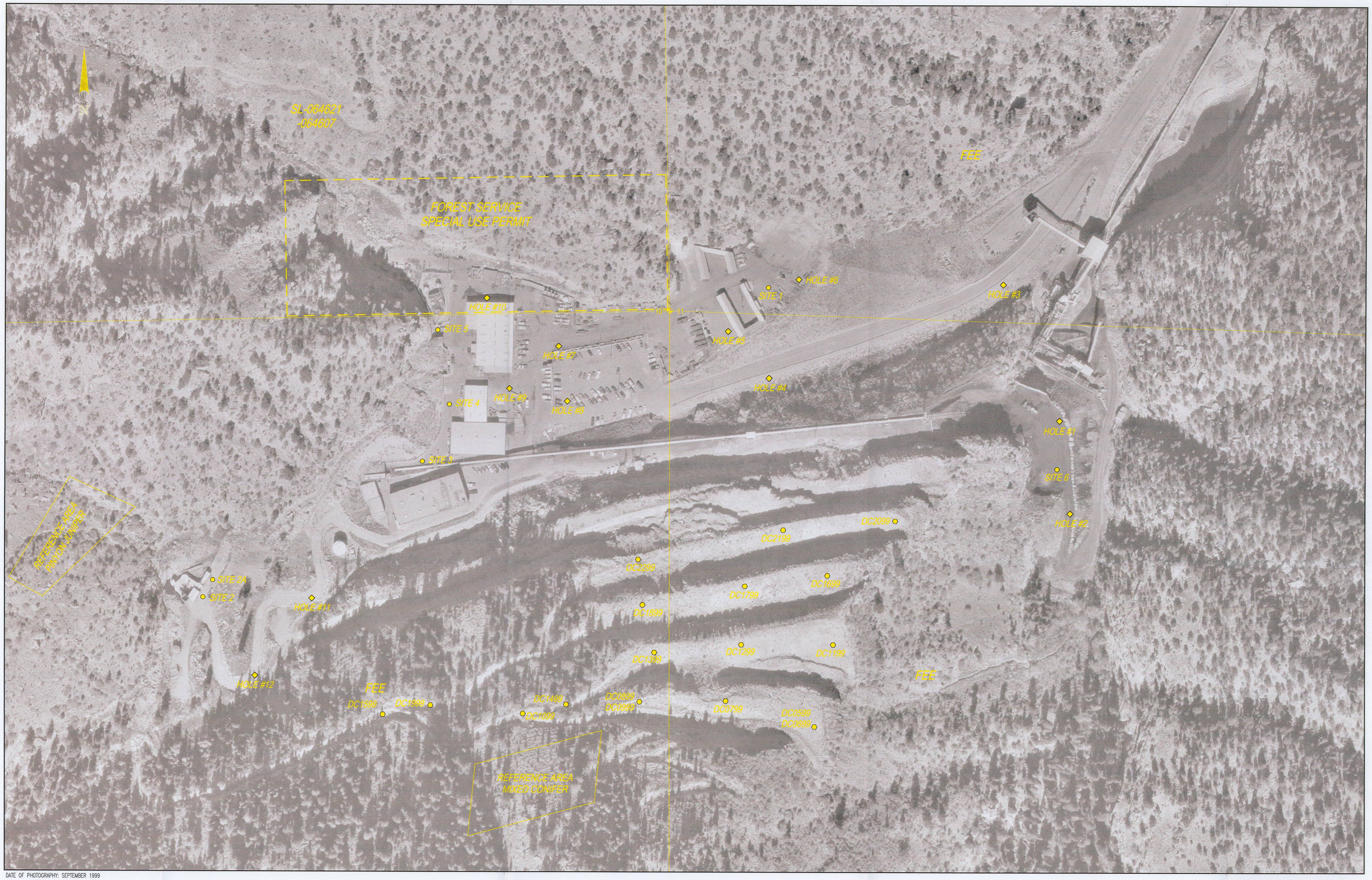
PacifiCorp

Deer Creek Mine

C/015/0018

Clean Copy Submittal, Task ID 2748
Soil Sampling Information

Map DS1810D
Replace Map (Seven Clean Copies)



LEGEND

SITE 1 = SLOPE STABILITY RECLAMATION SOIL SAMPLING SITES – 2000

DC2199 = DEER CREEK TERRACE SOIL SAMPLING SITES – 1999

HOLE #1 = DEER CREEK SOIL SAMPLING PROGRAM – 2002

DATE OF PHOTOGRAPHY: SEPTEMBER 1999

CAD FILE NAME/DISK#: DS1810D.DWG

RECEIVED
JUL 16 2007
DIV. OF OIL, GAS & MINING

DATE	REVISIONS	BY	CHK
10-24-02	ADDED 2002 SOIL SAMPLING LOCATIONS	DCO	
11-7-01	REVISED SOIL SAMPLING SITE SYMBOLS FOR SITE 1 & SITE 2A	KJL	
11-2-01	REVISED NOTATION ON SOIL SAMPLE SITE DC0899	KJL	
3-9-01	ADDED PROPOSED TOPSOIL AND SUBSOIL SAMPLING AREAS	KJL	

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

DEER CREEK COAL MINE
MINE PLAN AREA
SOIL SAMPLE LOCATION MAP

DRAWN BY: K. LARSEN
SCALE: 1"=100'
DATE: AUGUST 28, 2000
DRAWING #: DS1810D
SHEET 1 OF 1
REV.