OGMCOAL DNR <ogmcoal@utah.gov>

Restoration of Prime Farmland after surface mining Coal Hollow C/015/0005

Priscilla Burton <priscillaburton@utah.gov> Mon, Mar 23, 2020 at 12:13 PM
To: bir.thapa@usda.gov
Cc: OGMCOAL DNR <ogmcoal@utah.gov>, Christine Belka <cbelka@osmre.gov>, Steve Christensen <stevechristensen@utah.gov>

Hello Mr. Thapa,

We spoke by telephone earlier today and you asked me to send an email outlining my request.

In 2016 and 2017, our agencies worked together to approve mining of prime farmland near the town of Alton in Kane County, Utah. The federal rule/law governing our responsibility is 30CFR823.4 Performance Standards on Prime Farmlands at https://ecfr.io/Title-30/pt30.3.823#se30.3.823_14 and section 515(b)(7) of the Surface Mining Control and Reclamation Act of 1977 (SMCRA). Here is a link to the SMCRA reference https://www.osmre.gov/lrg/docs/SMCRA.pdf please scroll to p. 77.

In 2019, The Coal Hollow Mine completed mining on the following prime farmland or farmland of statewide importance.

In Range 6 West, Township 39 South Section 12:

G. Ferril & Dorothy Heaton, P.O. Box 100063, Alton, UT 84710, 7.2 acres in parcel 9-6-12-1.

Orval & Greta Palmer, P.O. Box 100144, Alton, UT 84710-0144; 6.9 acres in parcels 9-6-12-3.

Dean R. Heaton, P.O. Box 435, Fredonia, AZ 86022, 17.9 acres in parcel 9-6-12-2.

In R 5 West T 39 S Section 7:

G. Ferril & Dorothy Heaton, have parcel 9-5-7-3A which is included in the 6.9 acres above.

Reconstruction of the soil will take place this summer. Former State Soil Scientist Michael Domeier and Meridith Albers reviewed and approved the soil reconstruction plans, which include density evaluation of the replaced soil horizons. Please see attached copy of the mine plan page (Chap 9, p. 12) that describes the density evaluation. The reconstruction plan was vague as to how to achieve a rapid, real time density measurement. The mine operator has suggested using a nuclear density probe. The operator gathered pre-disturbance measurements and proposes comparing the pre-disturbance measurements with post reconstruction measurements to show the density requirement has been met.

I have attached the mine operator's density monitoring proposal for your review. The new information is presented as redline text and in the new Appendix 9-1. This most recent submittal is missing Appendix A and Appendix D. I will send these appendices in a separate email, so that the attachments do not exceed the maximum memory.

As required by SMCRA, I am asking for your comment and approval of this approach. Feel free to call me to discuss this proposal. I am also working from home this week, due to Clovid-19. You can reach me at the cell phone below or by email.

Regards,

Priscilla Burton, MS, CPM, CPSSc
Environmental Soil Scientist
Utah Division of Oil, Gas, & Mining
Price Field Office

cell: 435-609-1014
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2 attachments

09 CHAPTER 9 12.pdf
83K

monitoring density 02112020.6066.pdf
22892K

OGMCOAL DNR <ogmcoal@utah.gov>

email #2 Coal Hollow C/015/0005 prime farmland density determination

1 message

Priscilla Burton <priscillaburton@utah.gov> Mon, Mar 23, 2020 at 12:18 PM
To: bir.thapa@usda.gov
Cc: OGMCOAL DNR <ogmcoal@utah.gov>, Steve Christensen <stevechristensen@utah.gov>, Christine Belka <cbelka@osmre.gov>

Hello Mr. Thapa,

This second email provides Appendix A and Appendix D of the new prime farmland Appendix 9-1.

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2 attachments

Appendix D.pdf
512K

Appendix A.pdf
13473K

average salvage depths of the B and C horizons in Prime Farmland areas is detailed in Table 13 in Volume 11: Supplemental Report section of the MRP in the report called: *Order 2 Soil Survey for the North Private Lease Expansion of the Coal Hollow Mine* (November 2014).

The C horizon will be stockpiled and stockpiled as B horizon soil, if the depth of C horizon soil to be stockpiled is less than 6 inches. It is anticipated that this consolidation of materials will not diminish the quality of the B horizon.

C horizon materials will primarily consist of soils with pH greater than 8.5.

317.440 Protection of Prime Farmland Stockpiles

Stockpiles of salvaged soil from the A, B, and C horizons will be placed at locations within the permit area where they will not be disturbed or be subject to excessive erosion. If left in place for more than 30 days, stockpiles will meet the requirements of R645-301- 232, R645-301-233.100, R645-301-234, R645-301-242, and R645-301-243.

Stockpiled Prime Farmland materials will be subject to the following conditions within 30 days of stockpiling.

(a) They will be selectively placed on a stable site within the permit area. Prime Farmland soils will be stockpiled by horizon and by landowner. Stockpile areas in the North Private Lease are shown on Drawing 2-4

(b) They will be protected from contaminants and unnecessary compaction that would interfere with revegetation.

(c) They will be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the UDOGM. The side slopes will be graded to a maximum 3h:1v. Drawing 2-4 shows the planned stockpile areas, anticipated storage time, quantities and size for the North Private Lease. The interim seed mix for the Prime Farmland stockpiles is the following:

Stockpile Interim Seed Mix		
		Rate (PLS/Acre)
Bromus carinatus	Mountain Brome	6
Elymus lanceolatus	Thickspike wheatgrass	4
Elymus amithii	Western wheatgrass	5
Elymus spicatus	Bluebunch wheatgrass	6
Poa pratensis	Kentucky bluegrass	0.4
Triticum aestivum x Secale cereal	Sterile Triticale	5.00
Total		**26.40**

(d) They will not be moved until required for redistribution unless approved by

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R645-302-317 Prime Farmland Performance Standards

317.100 Scope and Purpose

317.200 Responsible Agencies

The Natural Resources Conservation Service and UDOGM will consult with ACD on Prime Farmland areas within the North Private Lease mine permit area.

R645-302-315 makes clear that the authority with regard to prime farmland soils is the Secretary of Agriculture through the Utah NRCS State Soil Conservationist. The Division has initiated consultation with the State Conservationist per R645-301-315.100 and R645-301-315.200. Prior to approval, the State Conservationist is required to review and comment on the details of the proposed plan.

317.210 Prime Farmland Specifications

The NRCS within Utah will establish specifications for prime farmland soil removal, storage, replacement, and reconstruction.

The Division is in consultation with the NRCS State Conservationist to determine the preferred Prime Farmland soil-reconstruction. That coordinated review is ongoing and the recommendations made by the NRCS will be incorporated into the mining plan.

317.220 Implementation of Prime Farmland Specifications

UDOGM will use the soil-reconstruction specifications established by the NRCS to carry out its responsibilities in accordance with R645-302-310 through R645-302-~~311~~ 316 and R645-302-316 and R645-301-800.

317.300 Applicability

The requirements of the R645-302-317 will not apply to prime farmland that has been excluded in accordance with R645-302-311 and R645-302-312.

The current Coal Hollow mine was permitted after August 3, 1977.

317.400 Soil Removal and Stockpiling

Soil will be removed from Prime Farmland areas by horizon (A, B, and C) and stockpiled separately by landowner. Estimated salvage depths for the A, B, and C horizons for soil map units in the Prime Farmland areas can be found in Volume 11: Supplemental Report section of the MRP in the report called: *Order 2 Soil Survey for the North Private Lease Expansion of the*

Coal Hollow Mine (November 2014).

Soil samples will be collected from the Prime Farmland areas prior to salvaging to a depth of 48 inches and analyzed by horizons for pH, density, sodium adsorption ratio (SAR), conductivity (ECe), texture, and available water capacity. Sample locations will be approximately one per 2 acres. Horizon samples will be limited to depths of approximately 12 inches. Additional analysis parameters may be included after consultation with UDOGM and the NRCS. Prime Farmland soil samples were collected June 5 and August 16, 2018, data from the required analysis can be found in Appendix 9-1.

317.410 Timing

Prime farmland soils will be removed from the areas to be disturbed before drilling, blasting, or mining. ACD will minimize prime farmland soil removal and stockpiling activities during periods of soil saturation following storm events or spring runoff.

317.420 Salvage Depth of Prime Farmland Soils

The minimum depth of soil and substitute soil material to be reconstructed will be 48 inches, or a lesser depth equal to the depth to a subsurface horizon in the natural soil that inhibits or prevents root penetration, or a greater depth if determined necessary to restore the original soil productive capacity.

Table 13 in Volume 11: Supplemental Report section of the MRP in the report called: *Order 2 Soil Survey for the North Private Lease Expansion of the Coal Hollow Mine* (November 2014) details the estimated total salvage depths for Prime Farmland soil map unit. It is anticipated that the salvage depths of B and C horizons in adjacent Prime Farmland soil map units can be increased in order to achieve a minimum final reclamation soil profile depth of 48 inches. The estimated average soil depth that can be salvaged from soil map units A1, A2, N and D is limited by the depth to Tropic shale.

317.430 Soil Removal and Stockpiling

Soil removal and stockpiling will be conducted to:

317.431 Separate Removal and Stockpiling of Topsoil

The A horizon or topsoil in Prime Farmland areas will be removed and stockpiled separately by landowner in a manner that will create a final soil having a greater productive value than prior to mining. It is anticipated that the duration of stockpiling Prime Farmland topsoil will be of short duration, since the Prime Farmland areas are at the north end of the proposed mining sequence. Estimated average salvage depths of the A horizon or topsoil in Prime Farmland areas is detailed in Table 13 in Volume 11: Supplemental Report section of the MRP in the report called: *Order 2 Soil Survey for the North Private Lease Expansion of the Coal Hollow Mine* (November 2014).

317.432 Separate Removal and Stockpiling of B and C horizons

Removal and stockpiling of all Prime Farmland soil horizons will be directly monitored by a Certified Professional Soil Scientist.

The B and C horizons will be removed and stockpiled separately by landowner in a manner that will create a final soil having a greater productive value than prior to mining. It is anticipated that the duration of stockpiling Prime Farmland B and C soil horizons will be of short duration, since the Prime Farmland areas are at the north end of the proposed mining sequence. Estimated average salvage depths of the B and C horizons in Prime Farmland areas is detailed in Table 13 in Volume 11: Supplemental Report section of the MRP in the report called: *Order 2 Soil Survey for the North Private Lease Expansion of the Coal Hollow Mine* (November 2014).

The C horizon will be stockpiled and stockpiled as B horizon soil, if the depth of C horizon soil to be stockpiled is less than 6 inches. It is anticipated that this consolidation of materials will not diminish the quality of the B horizon.

C horizon materials will primarily consist of soils with pH greater than 8.5.

317.440 Protection of Prime Farmland Stockpiles

Stockpiles of salvaged soil from the A, B, and C horizons will be placed at locations within the permit area where they will not be disturbed or be subject to excessive erosion. If left in place for more than 30 days, stockpiles will meet the requirements of R645-301- 232, R645-301-233.100, R645-301-234, R645-301-242, and R645-301-243.

Stockpiled Prime Farmland materials will be subject to the following conditions within 30 days of stockpiling.

(a) They will be selectively placed on a stable site within the permit area. Prime Farmland soils will be stockpiled by horizon and by landowner. Stockpile areas in the North Private Lease are shown on Drawing 2-4

(b) They will be protected from contaminants and unnecessary compaction that would interfere with revegetation.

(c) They will be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the UDOGM. The side slopes will be graded to a maximum 3h:1v. Drawing 2-4 shows the planned stockpile areas, anticipated storage time, quantities and size for the North Private Lease. The interim seed mix for the Prime Farmland stockpiles is the following:

Stockpile Interim Seed Mix		
		Rate (PLS/Acre)
Bromus carinatus	Mountain Brome	6
Elymus lanceolatus	Thickspike wheatgrass	4
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Elymus spicatus	Bluebunch wheatgrass	6
Poa pratensis	Kentucky bluegrass	0.4
Triticum aestivum x Secale cereal	Sterile Triticale	5.00
Total		**26.40**

(d) They will not be moved until required for redistribution unless approved by the UDOGM. Drawing 2-4 shows the anticipated storage time for each stockpile in the North Private Lease.

317.500 Soil Replacement

317.510 Soil Profile Reconstruction

Prime Farmland topsoil and subsoil will be replaced by horizons in the order that they existed prior to removal with the A horizon being on top, the B horizon in the middle, and the C horizon on the bottom of the reconstructed soil profile. Soil samples will be collected from the final graded surface in the Prime Farmland areas on a basis of approximately one sample per two acres on a random statistical grid. The soil samples will be analyzed for horizon depth, pH, density, sodium adsorption ration (SAR), conductivity (ECe), texture, and available water capacity. Horizon samples will be limited to depths of approximately 12 inches.

317.520 Depth of Reconstructed Soil Profile

The combined depth of the reconstructed A, B, and C horizons will be a minimum of 48 inches. Substitute subsoil from adjacent soil map units will be incorporated as either B or C horizon material in areas where the soil depth was less than 48 inches prior to mining. Table 13 in Volume 11: Supplemental Report section of the MRP in the report called: *Order 2 Soil Survey for the North Private Lease Expansion of the Coal Hollow Mine* (November 2014) details the estimated soil profiles for each of the Prime Farmland soil map units.

317.530 -Soil Compaction Monitoring

Soil compaction or density will be monitored during replacement of the A, B, and C horizons. The soil will be ripped or disked as needed to achieve soil densities similar to those documented in the Prime Farmland soils prior to removal and stockpiling as detailed in R645-302-317.400. Prime Farmland soil samples were collected June 5 and August 16, 2018, density data from these samples can be found in Appendix 9-1. The overlying soil horizon will not be reconstructed until the desired soil density has been achieved in the underlying soil horizon.

317.540 Replacement of B and C horizons

The combined depth of the B and C horizons will be sufficient to achieve a total minimum depth of 48 inches when the A horizon is included as part of the depth.

317.550 Replacement of A horizon

The A horizon or topsoil will be replaced in Prime Farmland areas as the final soil surface layer. This surface soil layer will equal or exceed the thickness of the original surface soil layer. The thickness of the average original soil surface layer in Prime Farmland areas is detailed in Table 13 in Volume 11: Supplemental Report section of the MRP in the report called: *Order 2 Soil Survey for the North Private Lease Expansion of the Coal Hollow Mine* (November 2014).

317.600 Revegetation and Restoration of Soil Productivity

317.610 Vegetation Establishment

Following prime farmland soil replacement, the soil surface will be stabilized with a vegetative cover or other means that effectively controls soil loss by wind and water erosion. Mulching and fertilization of prime farmland will be implemented as described in Chapter 2, Section 240. Unless the landowner specifies a change in the revegetation plans in the future, the pasture will be reclaimed with the existing pasture land species mixture (see Table 3-38). However, it is recommended that the landowner of each parcel work with local NRCS staff to develop a seeding mix suited to their specific site (irrigated vs. non-irrigated) and operation goals.

317.620 Restoration of Prime Farmland Productivity

317.621 Measurement of Prime Farmland Productivity

Productivity of the reconstructed Prime Farmland areas will be measured through the use of Animal Unit Months (AUM) for pasture as recommended by NRCS.

317.622 Productivity Monitoring Program

The productivity of the reconstructed Prime Farmland areas will be measured with a statistically valid program with 90 percent or greater confidence. The AUM yield assessment, for pastures land on prime farmland, will be at the rate of “26 pounds of dry forage consumed per 1,000 pound animal per day”.

317.623 Monitoring Period

The measurement period for determining average annual crop production will be a minimum of three years prior to release of the performance bond.

317.624 Management Level

The level of management applied to the reconstructed Prime Farmland during the measurement period will be equal to the management level on non-mined similar adjacent areas.

317.625 Restoration of Soil Productivity

Restoration of soil productivity will be considered achieved when the average yield during the measurement period equals or exceeds the average yield of the reference crop established for the same period for non-mined soils of the same or similar texture or slope phase of the soil series in the surrounding area under equivalent management practices.

317.626 Reference Crop

The reference crop on which restoration of soil productivity is proven will be selected from the crops most commonly produced on the surrounding prime farmland. Where row crops are the dominant crops grown on prime farmland in the area, the row crop requiring the greatest rooting depth will be chosen as one of the reference crops. For the North Private Lease Prime Farm Land, the reference crop will be pasture as in surrounding prime farmland supporting pasture lands.

317.627 Reference Crop Yields

Reference crop yields for the selected reference crop will be determined from, either:

317.627.1 Yield Records

Soil productivity standards of 2,000 lbs/ac for irrigated pastureland and 1,100 lbs/ac for dry pasturelands has been determined by the Division in consultation with the NRCS.

317.628 Adjustment of Reference Yields

Average reference crop yields in R645-302-317.627 may be adjusted, with concurrence of the NRCS, for:

ACD is not requesting adjustment of Reference Yields.

317.628.1 Environmental Impacts

Disease, pest, and weather-related seasonal variations; or

317.628.2 Management Practices

Differences in specific management practices where the overall management practices of the crops being compared are equivalent.

APPENDIX 9-1

North Private Lease

Prime Farmland Data

Introduction

It was determined prior to mining in the North Private Lease, that approximately 21.4 acres qualified as Prime farmland and 24.4 acres as Soils of Statewide Importance (see Drawing 2-3). Alton Coal Development, LLC (ACD) has elected to treat both of these soil classifications as Prime Farmland governed by those rules found in R645-302-316. Appendix 9-1 thus has been added to the MRP to store the information required in Chapter 9, 317.400 Soil Removal and Stockpiling

Prime Farmland soil samples were collected June 5 and August 16, 2018 under direction of Bruce Chesler, soil scientist. Data from the required analysis can be found in Appendix 9-1.

Fieldwork and Labwork Procedure

Twenty-one backhoe trench profiles and two hand augured holes were sampled on two separate dates in December, 2018. Sample locations are shown on Figure 1. Ninety-two 1-gallon bag bulk samples were filled from each soil horizon identified in the field by backhoe trench observations and by auger core sampling. These bulk bag samples were sent to Intermountain Labs in Sheridan, Wyoming (IML) on June 20, 2018 and September 14, 2018. Lab results can be found in Appendix A. Lab samples were reviewed and compared with UDOGM Guidelines for Topsoil Management 2008 in their suitability for use in reclamation planning. A summary of laboratory analytical results is presented in Table 1.

In addition to these bulk samples, soil micro-monolith boxes were prepared for each sampled horizon and are found in Appendix B of this document. Soil profile photos were also recorded and are found in Appendix C of this document.

Finally, as the ultimate goal of the sampling program is to determine the density of the prime farmland soils pre-mining to aid in replacing these at similar densities at the time of reclamation, ACD, also acquired field density test. Field density information was collected by Gem Engineering, Inc using nuclear density. A Gem Engineering technician was present at the time the backhoe trenches were excavated. For all trenches, the surface vegetation was removed with the backhoe creating a level, flat surface for the nuclear gage. The technician then would place a metal plate, similar in size to the nuclear gage, with a metal prob affixed vertically, on the prepared surface. The metal prob is pounded into the ground to pre-create a hole in the location that the probe of the nuclear density instrument could be inserted. The metal plate with prob is then carefully removed and replaced with the nuclear density instrument and the nuclear density prob can be lowered in the pre-created hole to the desired depth with in the hole. At this point, the technician proceeds to acquire the information necessary to determine compaction to the soil at the desired depth. The dry density measurement reported in lbs/cm^3 collected from the instrument can then be converted to g/cm^3 by a factor of 0.016. The backhoe was then employed to dig to the next desired depth of measurement with the nuclear density prob. This method was continued until the trench reached its final depth and density information obtained of in-place soil. Gem Engineering's Field Density Test Summary sheets can be found in Appendix D and a summary of this information ~~in comparison to the bulk densities determined from soil samples sent to Intermountain Labs~~converted to dry density gr./cm^3 is provided on Table 2.

Summary

Information required by Chapter 9, 317.400 has been collected within this document. The end results of the collection of the information contained in this document, is to aid in soil replacement to restore the prime farmland. Information contained herein will be utilized in fulfilling the requirements of MRP section 317.530 Soil Compaction Monitoring.

It should be noted that the IML data contains Bulk Density (gr./cm^3). This information is considered unsuitable for monitoring redistribution of prime farmland soils because it cannot be determined in a timely manner. Also, the IML bulk density data is not accurate, because the volume of the original soil core was not recorded. The IML bulk density data were obtained by picking out a soil clod from the 1-gallon sample bag at the lab. The volume of the clod was obtained by coating it in paraffin (to preserve the pore space within) and measuring its displacement in water.

It was determined that in order to achieve timely results at the time of soil replacement for soil compaction, an additional method that could be utilized as soil are being replaced was necessary. Therefore, the additional field density information obtained by Gem Engineering by the nuclear density method was added. From the information collected by Gem Engineering premining (Table 2), average dry densities of the prime farmland soil by horizon are as follow: A horizon – 1.35 gr./cm^3, B horizon – 1.53 gr./cm^3 and C horizon – 1.62 gr./cm^3.

It is anticipated that at the time of soil placement, ACD will place the horizons in separate layers and prior to placement of the overlying soil horizon, utilize the nuclear density to determine if the desired soil density has been achieved of the underlying soil horizon (desired soil densities will be equivalent to or less than the average premining soil density). In the event that an area has become excessively compacted, the immediate results of the nuclear density instrument would indicate this and the affected area could be disked to modify the soil density. The nuclear density method will allow placement of the successive soil horizons to proceed in a continuous manor without having to delay work until lab results can be obtained.

Figure 1 Soil Sample Locations in Prime Farmland and Soils of Statewide Importance

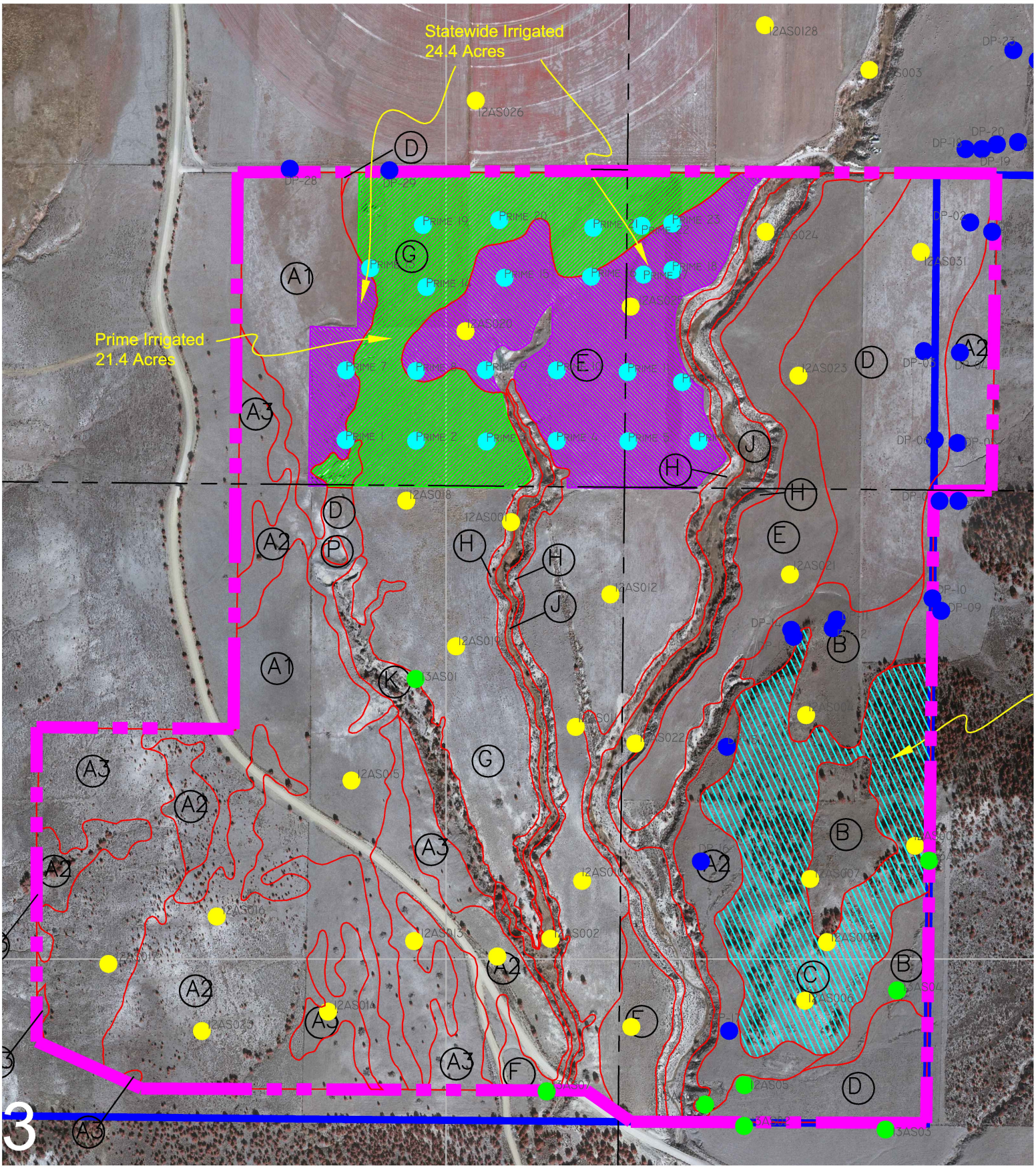


Table 1 Summary of laboratory analysis of soil samples collected from NPL Prime Farmland soils salvaged in 2018

SampleID	Sampled	Begin Depth	End Depth	pH	Electrical Conductivity	Field Capacity	Wilting Point	Calcium PE	Magnesium PE	Sodium PE	SAR	Sand	Silt	Clay	Texture	Bulk Density
		inches	inches	s.u.	dS/m	%	%	meq/L	meq/L	meq/L		%	%	%		g/cm³
Prime 1	6/11/18	0	12	7.7	1.04	38.9	30.0	6.82	3.29	0.35	0.16	9.0	43.0	48.0	Silty Clay	3.78
Prime 1	6/11/18	12	24	8.0	0.51	32.8	24.0	2.56	1.66	0.21	0.14	3.0	60.0	37.0	Silty Clay Loam	3.05
Prime 1	6/11/18	24	36	8.2	0.35	28.4	21.3	1.35	1.53	0.26	0.22	<0.1	62.0	38.0	Silty Clay Loam	2.69
Prime 1	6/11/18	36	48	8.2	0.87	28.5	18.3	1.39	5.20	1.23	0.68	3.0	67.0	30.0	Silty Clay Loam	3.13
Prime 2	6/11/18	0	12	8.0	0.65	42.0	29.1	3.34	2.27	0.16	0.10	17.0	50.0	33.0	Silty Clay Loam	12.3
Prime 2	6/11/18	12	20	8.1	0.46	42.9	29.0	2.29	1.72	0.16	0.11	6.0	55.0	39.0	Silty Clay Loam	3.98
Prime 2	6/11/18	20	32	8.1	0.36	33.4	24.1	1.72	2.00	0.33	0.25	<0.1	48.0	52.0	Silty Clay	2.82
Prime 2	6/11/18	32	48	8.2	0.48	32.4	23.4	1.04	2.88	0.32	0.23	1.0	53.0	46.0	Silty Clay	3.19
Prime 3	6/11/18	0	12	7.9	0.61	47.6	26.5	3.68	2.03	0.13	0.08	14.0	50.0	36.0	Silty Clay Loam	10.5
Prime 3	6/11/18	12	18	8.1	0.56	42.0	29.4	2.55	2.67	0.14	0.08	10.0	46.0	44.0	Silty Clay	8.77
Prime 3	6/11/18	18	30	8.4	0.47	36.8	25.6	0.88	3.31	0.21	0.14	6.0	59.0	35.0	Silty Clay Loam	3.90
Prime 3	6/11/18	30	48	8.4	0.46	32.1	23.0	1.09	3.18	0.32	0.22	1.0	65.0	34.0	Silty Clay Loam	2.91
Prime 4	6/11/18	0	12	8.0	0.75	32.5	20.2	3.54	3.32	0.10	0.06	18.0	48.0	34.0	Silty Clay Loam	3.82
Prime 4	6/11/18	12	24	8.2	0.60	35.5	23.1	2.26	3.60	0.41	0.24	9.0	60.0	31.0	Silty Clay Loam	4.27
Prime 4	6/11/18	24	36	8.3	0.42	33.0	16.3	1.16	2.81	0.25	0.18	5.0	71.0	24.0	Silty Loam	3.79
Prime 4	6/11/18	36	48	8.7	0.36	21.2	5.4	1.14	2.23	0.33	0.25	65.0	25.0	10.0	Sandy Loam	3.68
Prime 5	6/11/18	0	12	7.9	0.73	30.8	11.8	3.97	3.22	0.21	0.11	43.0	37.0	20.0	Loam	3.08
Prime 5	6/11/18	12	18	7.8	0.74	33.6	26.2	3.91	3.30	0.30	0.16	12.0	47.0	41.0	Silty Clay	3.17
Prime 5	6/11/18	18	30	8.1	0.62	33.0	24.6	2.26	3.32	0.49	0.29	<0.1	57.0	43.0	Silty Clay	3.23
Prime 5	6/11/18	30	48	8.4	0.60	29.5	17.8	1.30	4.33	0.42	0.25	12.0	63.0	25.0	Silty Loam	3.67
Prime 6	6/11/18	0	12	7.8	0.60	28.7	9.8	3.68	1.65	0.12	0.08	46.0	37.0	17.0	Loam	3.60
Prime 6	6/11/18	12	20	8.0	0.58	34.3	21.4	3.14	2.44	0.17	0.10	14.0	49.0	37.0	Silty Clay Loam	4.75
Prime 6	6/11/18	20	36	8.2	0.35	33.2	22.7	1.71	1.93	0.24	0.18	8.0	56.0	36.0	Silty Clay Loam	3.10
Prime 6	6/11/18	36	48	8.3	0.34	23.0	12.0	1.58	2.23	0.26	0.19	44.0	34.0	22.0	Loam	3.01
Prime 7	6/11/18	0	12	7.9	0.65	35.7	21.4	4.46	1.63	0.21	0.12	33.0	32.0	35.0	Clay Loam	5.13
Prime 7	6/11/18	12	24	8.1	0.57	46.1	32.6	2.57	3.07	0.50	0.30	4.0	42.0	54.0	Silty Clay	4.17
Prime 7	6/11/18	24	36	8.2	3.65	30.7	23.1	3.23	32.1	10.8	2.57	<0.1	50.0	50.0	Silty Clay	2.70
Prime 7	6/11/18	36	48	8.2	5.95	29.8	22.8	5.97	52.2	23.8	4.41	<0.1	54.0	46.0	Silty Clay	2.66
Prime 8	6/11/18	0	12	7.9	0.57	40.4	31.2	3.24	2.58	0.26	0.15	8.0	51.0	41.0	Silty Clay	5.96
Prime 8	6/11/18	12	20	8.2	0.36	37.0	27.0	1.73	1.50	0.18	0.14	7.0	50.0	43.0	Silty Clay	5.16
Prime 8	6/11/18	20	32	8.0	0.43	35.9	25.6	2.01	2.18	0.22	0.15	17.0	41.0	42.0	Silty Clay	3.67
Prime 8	6/11/18	32	48	8.1	0.30	27.8	21.9	1.86	1.98	0.33	0.24	<0.1	56.0	44.0	Silty Clay	2.78
Prime 9	6/11/18	0	12	8.0	0.56	47.5	27.5	3.29	2.03	0.29	0.18	14.0	48.0	38.0	Silty Clay Loam	24.5
Prime 9	6/11/18	12	20	8.2	0.43	60.8	26.0	2.41	2.13	0.17	0.11	14.0	59.0	27.0	Silty Clay Loam	6.51
Prime 9	6/11/18	20	32	8.3	0.65	34.8	27.4	1.85	4.70	0.54	0.30	4.0	49.0	47.0	Silty Clay	2.94
Prime 9	6/11/18	32	48	8.4	1.30	26.7	20.6	1.48	10.7	0.77	0.31	1.0	64.0	35.0	Silty Clay Loam	2.46
Prime 10	6/11/18	0	12	7.8	1.02	34.1	26.9	5.76	4.77	0.17	0.07	9.0	49.0	42.0	Silty Clay	3.55
Prime 10	6/11/18	12	24	8.2	0.50	30.6	23.8	1.98	2.86	0.27	0.18	1.0	65.0	34.0	Silty Clay Loam	3.52
Prime 10	6/11/18	24	36	8.2	0.40	28.9	22.3	1.80	2.41	0.37	0.26	3.0	61.0	36.0	Silty Clay Loam	2.97
Prime 10	6/11/18	36	48	8.2	0.38	26.3	14.7	1.08	2.37	0.25	0.19	13.0	62.0	25.0	Silty Loam	3.15
Prime 11	6/11/18	0	12	7.6	0.64	34.9	17.9	3.68	2.47	0.16	0.09	26.0	45.0	29.0	Clay Loam	3.51
Prime 11	6/11/18	12	18	7.9	0.74	35.5	23.3	4.17	3.85	0.36	0.18	15.0	45.0	40.0	Silty Clay	3.46
Prime 11	6/11/18	18	30	8.2	0.41	29.1	21.0	2.24	2.59	0.23	0.15	3.0	63.0	34.0	Silty Clay Loam	3.07
Prime 11	6/11/18	30	48	8.3	0.42	29.0	18.7	1.31	3.13	0.25	0.17	5.0	66.0	29.0	Silty Clay Loam	3.05
Prime 12	6/11/18	0	12	7.8	0.66	*	*	3.95	1.96	0.15	0.09	49.0	37.0	14.0	Loam	3.49
Prime 12	6/11/18	12	24	8.1	0.54	27.3	8.5	2.61	2.35	0.15	0.09	53.0	32.0	15.0	Sandy Loam	2.79
Prime 12	6/11/18	24	36	8.0	0.55	33.4	21.5	2.15	3.58	0.37	0.22	21.0	42.0	37.0	Clay Loam	3.12
Prime 12	6/11/18	36	48	8.3	0.88	35.2	26.6	2.67	6.64	0.89	0.41	1.0	56.0	43.0	Silty Clay	3.00
Prime #13	8/16/18	0	12	7.8	0.67	38.1	26.0	3.41	3.52	0.87	0.47	9.0	46.0	45.0	Silty Clay	7.08
Prime #13	8/16/18	12	24	8.3	0.43	29.1	11.8	1.27	2.88	0.81	0.56	50.0	27.0	23.0	Sandy Clay Loam	3.53
Prime #13	8/16/18	24	36	8.5	0.48	31.7	23.3	2.04	3.95	1.13	0.65	<0.1	46.0	54.0	Silty Clay	2.66
Prime #13	8/16/18	36	48	8.7	0.45	31.1	22.2	1.16	3.02	1.56	1.08	3.0	55.0	42.0	Silty Clay	3.12
Prime #14	8/16/18	0	12	7.9	0.47	41.0	29.8	3.37	2.17	0.37	0.22	15.0	42.0	43.0	Silty Clay	7.63
Prime #14	8/16/18	12	24	8.0	0.43	37.8	25.4	2.63	2.19	0.28	0.18	12.0	48.0	40.0	Silty Clay	6.94
Prime #14	8/16/18	24	36	8.2	0.35	46.6	22.7	1.60	2.36	0.35	0.25	29.0	35.0	36.0	Clay Loam	3.66
Prime #14	8/16/18	36	48	8.4	0.39	33.8	25.0	1.01	3.11	0.49	0.34	1.0	49.0	50.0	Silty Clay	2.74
Prime #15	8/16/18	0	12	7.9	0.44	40.7	28.7	3.12	1.75	0.12	0.08	12.0	51.0	37.0	Silty Clay Loam	*
Prime #15	8/16/18	12	24	8.2	0.34	25.8	17.5	2.07	1.51	0.24	0.18	35.0	34.0	31.0	Clay Loam	3.38
Prime #15	8/16/18	24	36	8.4	0.29	34.1	25.4	1.53	1.73	0.37	0.29	9.0	42.0	49.0	Silty Clay	2.83
Prime #15	8/16/18	36	48	8.5	0.34	31.2	22.8	1.42	2.48	0.42	0.30	<0.1	48.0	52.0	Silty Clay	2.75
Prime #16	8/16/18	0	12	7.7	0.62	44.0	27.5	4.04	2.79	0.18	0.09	11.0	49.0	40.0	Silty Clay	*
Prime #16	8/16/18	12	24	7.5	0.61	38.0	25.8	3.98	2.83	0.13	0.07	12.0	47.0	41.0	Silty Clay	*
Prime #16	8/16/18	24	36	8.0	0.35	35.7	28.0	2.53	1.63	0.12	0.09	10.0	48.0	42.0	Silty Clay	4.96
Prime #16	8/16/18	36	48	8.2	0.31	37.9	30.8	1.91	1.61	0.13	0.10	14.0	44.0	42.0	Silty Clay	5.32
Prime #17	8/16/18	0	12	7.8	0.71	35.4	25.3	4.05	3.40	0.15	0.08	11.0	46.0	43.0	Silty Clay	3.81
Prime #17	8/16/18	12	24	8.1	0.40	37.0	25.2	2.41	2.41	0.18	0.11	9.0	47.0	44.0	Silty Clay	4.71
Prime #17	8/16/18	24	36	8.4	0.29	27.4	19.9	1.02	2.31	0.24	0.19	8.0	63.0	29.0	Silty Clay Loam	3.96
Prime #17	8/16/18	36	48	8.5	0.30	21.8	7.8	1.01	2.56	0.28	0.21	44.0	43.0	13.0	Loam	3.82
Prime #18	8/18/18	0	12	7.6	0.40	33.1	26.4	2.94	2.05	0.27	0.17	11.0	50.0	39.0	Silty Clay Loam	*
Prime #18	8/18/18	12	24	8.0	0.37	32.5	23.1	2.16	2.20	0.19	0.13	4.0	64.0	32.0	Silty Clay Loam	4.95
Prime #18	8/18/18	24	36	8.1	0.32	28.6	18.9	1.34	1.83	0.44	0.35	1.0	66.0	33.0	Silty Clay Loam	3.28
Prime #18	8/18/18	36	48	8.1	0.33	22.6	10.9	1.19	1.97	0.52	0.41	24.0	54.0	22.0	Silty Loam	3.04
Prime #19	8/16/18	0	12	7.6	0.59	41.2	35.6	3.34	2.71	0.55	0.32	13.0	38.0	49.0	Clay	5.06
Prime #19	8/16/18	12	24	8.0	0.39	43.2	27.8	2.03	2.00	0.48	0.34	14.0	41.0	45.0	Silty Clay	*
Prime #19	8/16/18	24	36	8.3	0.39	39.1	28.3	0.96	2.74	0.58	0.42	8.0	43.0	49.0	Silty Clay	6.36
Prime #19	8/16/18	36	48	8.4	0.36	29.0	22.0	1.32	2.69	0.68	0.48	2.0	56.0	42.0	Silty Clay	2.63
Prime #20	8/16/18	0	12	7.7	0.56	40.6	29.4	3.59	1.46	0.63	0.40	17.0	36.0	47.0	Clay	5.06
Prime #20	8/16/18	12	24	7.9	0.41	38.5	29.8	2.22	2.01	0.49	0.34	4.0	50.0	46.0	Silty Clay	5.47
Prime #20	8/16/18	24	36	8.0	0.40	43.7	27.5	1.78	2.55	0.52	0.35	14.0	39.0	47.0	Clay	6.36
Prime #20	8/16/18	36	48	8.3	0.41	31.9	23.8	1.26	2.85	0.60	0.42	<0.1	50.0	50.0	Silty Clay	2.52
Prime #21	8/16/18	0	12	7.8	0.73	44.3	31.1	4.11	2.60	0.56	0.31	18.0	38.0	44.0	Clay	*
Prime #21	8/16/18	12	24	8.1	0.34	36.3	25.8	1.56	1.65	0.48	0.38	6.0	49.0	45.0	Silty Clay	2.91
Prime #21	8/16/18	24	36	8.4	0.33	25.9	18.9	1.18	2.73	0.51	0.36	7.0	57.0	36.0	Silty Clay Loam	2.99
Prime #21	8/16/18	36	48	8.4	0.33	26.0	19.1	1.16	2.89	0.52	0.37	<0.1	64.0	36.0	Silty Clay Loam	2.77
Prime #22	8/16/18	0	12	7.8	0.61	35.7	25.8	3.60	2.74	0.51	0.29	10.0	42.0	48.0	Silty Clay	3.78
Prime #22	8/16/18	12	24	7.8	0.52	40.4	21.8	2.45	3.22	0.53	0.32	23.0	36.0	41.0	Clay	2.85
Prime #22	8/16/18	24	36	8.2	0.38	28.1	21.4	1.56	2.51	0.50	0.35	11.0	49.0	40.0	Silty Clay	2.76
Prime #22	8/16/18	36	48	8.3	0.40	24.5	16.3	1.55	2.83	0.52	0.35	16.0	58.0	26.0	Silty Loam	2.74
Prime #23	8/21/18	0	12	7.6	0.63	36.8	25.9	3.89	2.79	0.41	0.23	14.0	40.0	46.0	Silty Clay	6.22
Prime #23	8/21/18	12	24	7.8	0.50	35.5	28.3	2.66	2.73	0.44	0.27	4.0	43.0	53.0	Silty Clay	*
Prime #23	8/21/18	24	36	8.2	0.32	30.1	22.1	1.87	2.38	0.48	0.33	<0.1	56.0	44.0	Silty Clay	2.99
Prime #23	8/21/18	36	48	8.5	0.30	25.8	16.0	0.88	2.18	0.51	0.41	7.0	67.0	26.0	Silty Loam	2.84

DOGM Suitability (200	Good	Fair	Poor	Unacceptable

Note: * Analysis was unable to be performed due to lack of suitable sample required by the method

Table 2 GEM data converted to Bulk Densities on NPL Prime Farmland soils salvaged in 2018

			GEM Engineering Field Density Test Summary				Converted Density Data	
			Field Data					
Sample ID	Horizon	Depth inches	Elev. inches	Dry Density lbs/ft^3	Moisture Content %	Compaction %	Lab Max Dry Density gr./cm^3	Dry Density gr./cm^3
Prime 1	A	0-12	-6	76.7	18.3	75	**1.64**	**1.23**
	B	12-24	-18	98.5	10.3	86	**1.84**	**1.58**
	B	24-36	-32	103.4	11.4	90	**1.84**	**1.65**
	B	36-48						
			-60	101.2	17.5	88	**1.84**	**1.62**
Prime 2	A	0-12	-6	70.5	12.1	69	**1.64**	**1.13**
	A	12-20	-20	93.8	18.7	82	**1.84**	**1.50**
	B	20-32	-38	87.4	14.1	76	**1.84**	**1.40**
	B	32-48						
			-53	100.3	15.9	87	**1.84**	**1.60**
Prime 3	A	0-12	-6	72.1	13.8	70	**1.64**	**1.15**
	A	12-18	-18	79.9	15.9	69	**1.84**	**1.28**
	B	18-30						
	B	30-48	-36	92.4	13.2	80	**1.84**	**1.48**
			-53	96.1	17.0	84	**1.84**	**1.54**
Prime 4	A	0-12	-6	86.9	9.0	85	**1.64**	**1.39**
	B	12-24	-18	80.7	10.5	79	**1.64**	**1.29**
	B	24-36	-28	85.0	6.3	74	**1.84**	**1.36**
	B	36-48	-48	no test same material				
Prime 5	A	0-12	-6	91.5	4.9	89	**1.64**	**1.46**
	A	12-18	-18	80.1	13.7	78	**1.64**	**1.28**
	B	18-30	-28	93.6	10.5	81	**1.84**	**1.50**
	B	30-48	-48	no test same material				
Prime 6	A	0-12	Not Tested					
	A	12-20						
	B	20-36						
	B	36-48						
Prime 7	A	0-12	-6	84.4	11.3	82	**1.64**	**1.35**
	A	12-24	-14	90.6	10.0	79	**1.84**	**1.45**
	B	24-36	-32	100.5	17.1	87	**1.84**	**1.61**
	C	36-48	-48	103.9	15.6	90	**1.84**	**1.66**
Prime 8	A	0-12	-6	76.6	15.7	75	**1.64**	**1.23**
	A	12-20	-18	78.2	14.9	76	**1.64**	**1.25**
	B	20-32						
	B	32-48	-38	95.6	17.9	83	**1.84**	**1.53**
			-53	no test same material				
Prime 9	A	0-12	-6	73.2	12.8	71	**1.64**	**1.17**
	A	12-20	-20	57.7	13.5	56	**1.64**	**0.92**
	B	20-32						
	B	32-48	-36	96.40	18.70	84	**1.84**	**1.54**
			-56	98.00	15.30	85	**1.84**	**1.57**
Prime 10	A	0-12	-6	76.5	11.9	75	**1.64**	**1.22**
	A	12-24	-18	87.3	8.9	76	**1.84**	**1.40**
	B	24-36	-28	98.1	7.4	85	**1.84**	**1.57**
	B	36-48	-48	no test same material				
Prime 11	A	0-12	-6	93.4	9.3	91	**1.64**	**1.49**
	A	12-18	-18	84.4	14.8	73	**1.84**	**1.35**
	B	18-30	-24	93.2	9.7	81	**1.84**	**1.49**
	B	30-48						
			-53	no test same material				
Prime 12	A	0-12	Not Tested					
	B	12-24						
	B	24-36						
	B	36-48						
Prime 13	A	0-12	-8	95.4	5.8	96	**1.58**	**1.53**
	A	12-24	-24	98.3	14.5	82	**1.92**	**1.57**
	B	24-36	-36	99.4	17.0	91	**1.75**	**1.59**
	B	36-48	-48	102.8	22.1	89	**1.85**	**1.64**
Prime 14	A	0-12	-12	84.7	6.9	86	**1.58**	**1.36**
	B	12-24	-26	78.4	16.3	65	**1.92**	**1.25**
	B	24-36	-36	96.4	18.7	88	**1.75**	**1.54**
	B	36-48	-48	102.1	18.1	88	**1.85**	**1.63**
Prime 15	A	0-12	-16	68.7	8.7	69	**1.58**	**1.10**
	A	12-24	-26	89.7	18.3	75	**1.92**	**1.44**
	B	24-36	-36	97.0	19.2	89	**1.75**	**1.55**
	B	36-48	-48	103.9	16.6	90	**1.85**	**1.66**
Prime 16	A	0-12	-8	85.9	13.8	87	**1.58**	**1.37**
	A	12-24	-24	85.1	12.6	71	**1.92**	**1.36**
	B	24-36	-36	84.3	16.0	77	**1.75**	**1.35**
	B	36-48	-48	83.2	17.4	72	**1.85**	**1.33**
Prime 17	A	0-12	-8	86.9	11.0	88	**1.58**	**1.39**
	A	12-24	-24	95.6	9.9	80	**1.92**	**1.53**
	B	24-36	-36	94.8	9.8	87	**1.75**	**1.52**
	B	36-48	-48	95.1	13.8	82	**1.85**	**1.52**
Prime 18	A	0-9	Not Tested					
Hand	B	9-24						
Augured	B	24-36						
	B	36-48						
	C	48-60						
Prime 19	A	0-12	-12	71.1	12.1	72	**1.58**	**1.14**
	A	12-24	-28	97.1	18.5	81	**1.92**	**1.55**
	B	24-36	-36	101.9	14.3	93	**1.75**	**1.63**
	B	36-48	-48	102.6	16.7	89	**1.85**	**1.64**
Prime 20	A	0-12	-12	76.0	11.3	77	**1.58**	**1.22**
	A	12-24	-28	86.1	12.9	72	**1.92**	**1.38**
	B	24-36	-38	90.4	20.7	83	**1.75**	**1.45**
	C	36-48	-48	98.8	20.1	86	**1.85**	**1.58**
Prime 21	A	0-12	-8	82.2	13.6	83	**1.58**	**1.32**
	A	12-24	-24	104.0	13.9	87	**1.92**	**1.66**
	B	24-36	-36	101.4	10.7	93	**1.75**	**1.62**
	B	36-48	-48	101.9	12.6	88	**1.85**	**1.63**
Prime 22	A	0-12	-8	82.3	9.6	83	**1.58**	**1.32**
	A	12-24	-24	89.7	16.9	75	**1.92**	**1.44**
	B	24-36	-36	92.5	10.5	84	**1.75**	**1.48**
	B	36-48	-48	100.4	12.4	87	**1.85**	**1.61**
Prime 23	A	0-12	Not Tested					
Hand	A	12-24						
Augured	B	24-36						
	B	36-48						

Appendix A----Intermountain Labs Analytical results

Appendix B

Soil Profile Location Photos

Soil Profile- Prime 1

Soil Profile- Prime 2

Soil Profile- Prime 3

Soil Profile- Prime 4

Soil Profile- Prime 5

Soil Profile- Prime 6

Soil Profile- Prime 7

Soil Profile- Prime 8

Soil Profile- Prime 9

Soil Profile- Prime 10

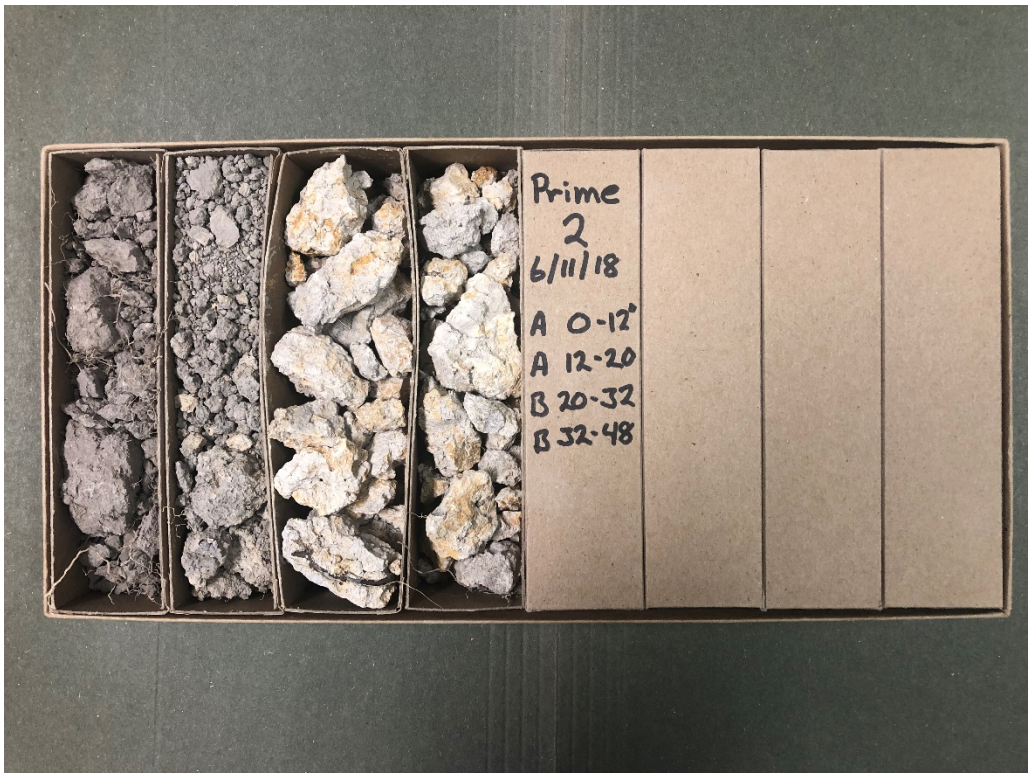
Soil Profile- Prime 11

Soil Profile- Prime 12

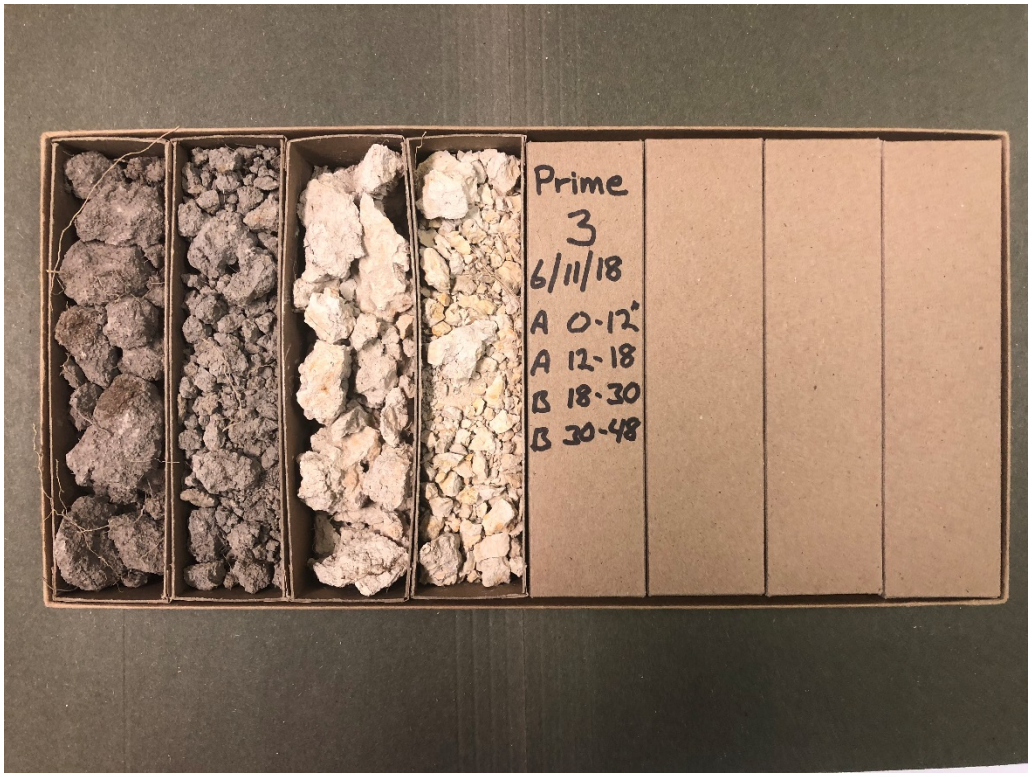
Appendix C

Soil Profile Box Photographs

Profile Box - Prime 1

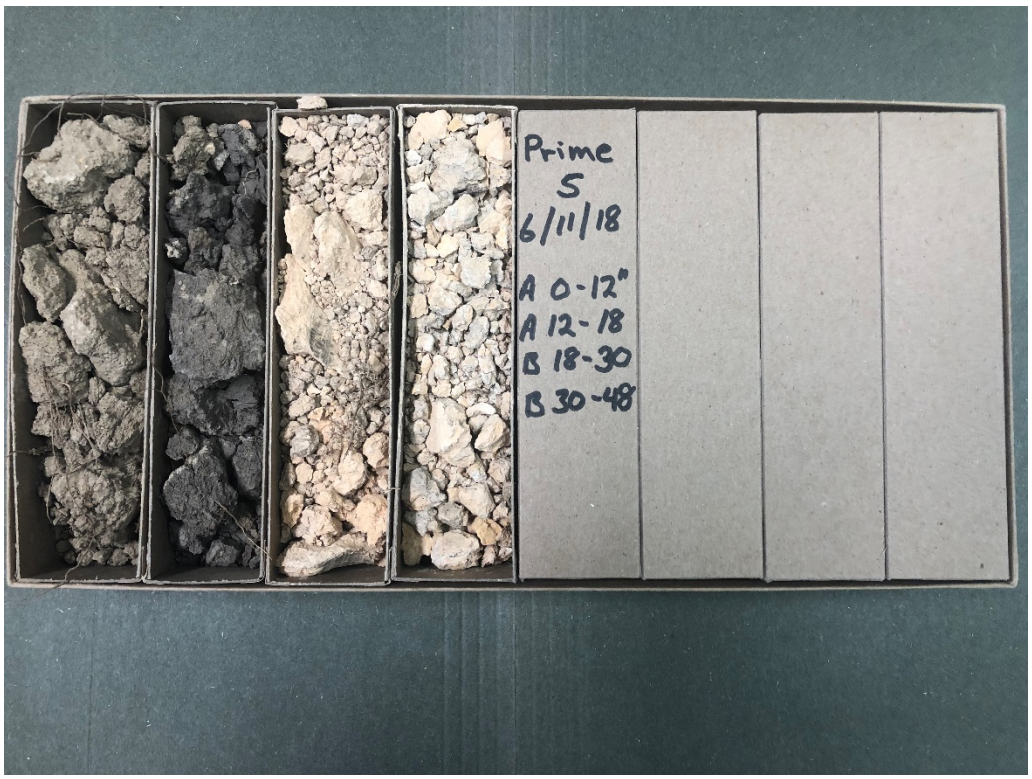


Profile Box - Prime 2



Profile Box - Prime 3

Profile Box - Prime 4



Profile Box - Prime 5

Profile Box - Prime 6

Profile Box - Prime 7

Profile Box - Prime 8

Profile Box - Prime 9

Profile Box - Prime 10

Profile Box - Prime 11

Profile Box - Prime 12

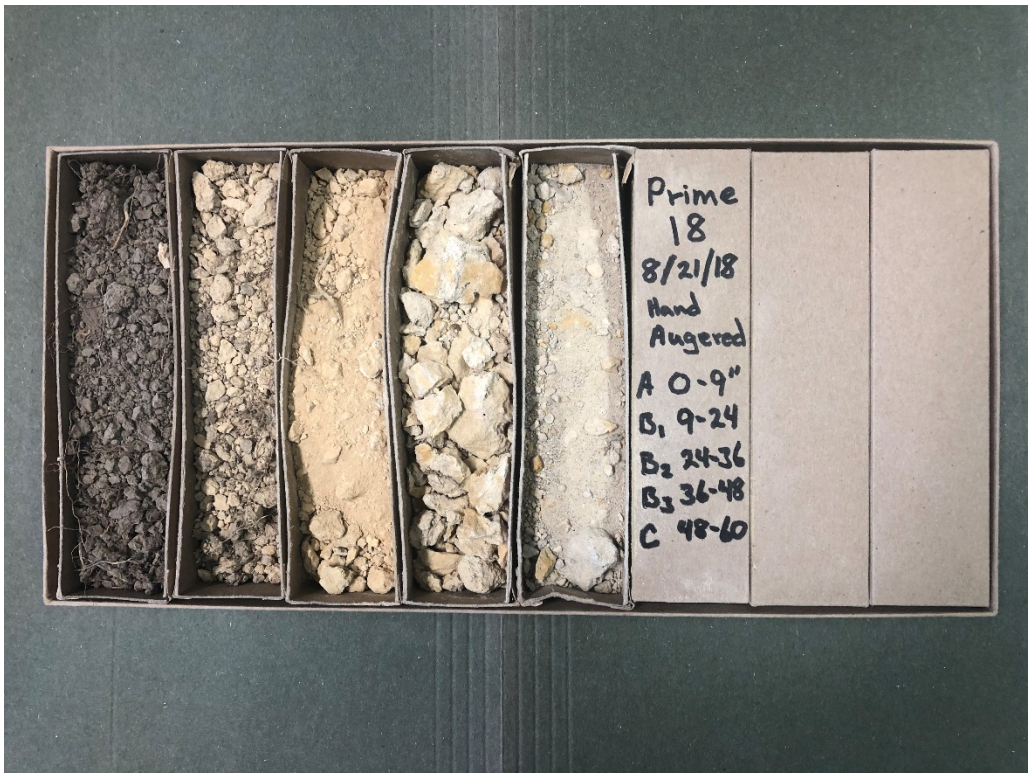
Profile Box - Prime 13

Profile Box - Prime 14

Profile Box - Prime 15

Profile Box - Prime 16

Profile Box - Prime 17



Profile Box - Prime 18

Profile Box - Prime 19

Profile Box - Prime 20

Profile Box - Prime 21

Profile Box - Prime 22

Profile Box - Prime 23

Appendix D

Gem Engineering, LLC
Field Density Test Summary Sheets

Appendix A----Intermountain Labs Analytical results

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Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 8/1/2018

CLIENT: Alton Coal Development, LLC
Project: Coal Hollow Mine
Lab Order: S1806383

CASE NARRATIVE

Report ID: S1806383001

Samples Prime 1, Prime 10, Prime 11, Prime 12, Prime 2, Prime 3, Prime 4, Prime 5, Prime 6, Prime 7, Prime 8 and Prime 9 were received on June 22, 2018.

Samples were analyzed using the methods outlined in the following references:

U.S.E.P.A. 600/2-78-054 "Field and Laboratory Methods Applicable to Overburden and Mining Soils", 1978
American Society of Agronomy, Number 9, Part 2, 1982
USDA Handbook 60 "Diagnosis and Improvement of Saline and Alkali Soils", 1969
Wyoming Department of Environmental Quality, Land Quality Division, Guideline No. 1, 1984
New Mexico Overburden and Soils Inventory and Handling Guideline, March 1987
State of Utah, Division of Oil, Gas, and Mining: Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, April 1988
Montana Department of State Lands, Reclamation Division: Soil, Overburden, and Regraded Spoil Guidelines, December 1994
State of Nevada Modified Sobek Procedure
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Available water capacity was unable to be performed on Prime 12 (0-12") due to insufficient sample volume.

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Soil Analysis Report

Alton Coal Development, LLC
463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1806383001

Project: Coal Hollow Mine
Date Received: 6/22/2018

Date Reported: 8/1/2018
Work Order: S1806383

Lab ID	Sample ID	Depths Inches	pH s.u.	Electrical Conductivity dS/m	Field Capacity %	Wilting Point %	Calcium PE meq/L	Magnesium PE meq/L	Sodium PE meq/L	SAR
S1806383-001	Prime 1	0-12	7.7	1.04	38.9	30.0	6.82	3.29	0.35	0.16
S1806383-002	Prime 1	12-24	8.0	0.51	32.8	24.0	2.56	1.66	0.21	0.14
S1806383-003	Prime 1	24-36	8.2	0.35	28.4	21.3	1.35	1.53	0.26	0.22
S1806383-004	Prime 1	36-48	8.2	0.87	28.5	18.3	1.39	5.20	1.23	0.68
S1806383-005	Prime 2	0-12	8.0	0.65	42.0	29.1	3.34	2.27	0.16	0.10
S1806383-006	Prime 2	12-20	8.1	0.46	42.9	29.0	2.29	1.72	0.16	0.11
S1806383-007	Prime 2	20-32	8.1	0.36	33.4	24.1	1.72	2.00	0.33	0.25
S1806383-008	Prime 2	32-48	8.2	0.48	32.4	23.4	1.04	2.88	0.32	0.23
S1806383-009	Prime 3	0-12	7.9	0.61	47.6	26.5	3.68	2.03	0.13	0.08
S1806383-010	Prime 3	12-18	8.1	0.56	42.0	29.4	2.55	2.67	0.14	0.08
S1806383-011	Prime 3	18-30	8.4	0.47	36.8	25.6	0.88	3.31	0.21	0.14
S1806383-012	Prime 3	30-48	8.4	0.46	32.1	23.0	1.09	3.18	0.32	0.22
S1806383-013	Prime 4	0-12	8.0	0.75	32.5	20.2	3.54	3.32	0.10	0.06
S1806383-014	Prime 4	12-24	8.2	0.60	35.5	23.1	2.26	3.60	0.41	0.24
S1806383-015	Prime 4	24-36	8.3	0.42	33.0	16.3	1.16	2.81	0.25	0.18
S1806383-016	Prime 4	36-48	8.7	0.36	21.2	5.4	1.14	2.23	0.33	0.25
S1806383-017	Prime 5	0-12	7.9	0.73	30.8	11.8	3.97	3.22	0.21	0.11
S1806383-018	Prime 5	12-18	7.8	0.74	33.6	26.2	3.91	3.30	0.30	0.16
S1806383-019	Prime 5	18-30	8.1	0.62	33.0	24.6	2.26	3.32	0.49	0.29
S1806383-020	Prime 5	30-48	8.4	0.60	29.5	17.8	1.30	4.33	0.42	0.25

These results apply only 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, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Your Environmental Monitoring Partner

Soil Analysis Report

Alton Coal Development, LLC
463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1806383001

Project: Coal Hollow Mine
Date Received: 6/22/2018

Date Reported: 8/1/2018
Work Order: S1806383

Lab ID	Sample ID	Depths Inches	pH s.u.	Electrical Conductivity dS/m	Field Capacity %	Wilting Point %	Calcium PE meq/L	Magnesium PE meq/L	Sodium PE meq/L	SAR
S1806383-021	Prime 6	0-12	7.8	0.60	28.7	9.8	3.68	1.65	0.12	0.08
S1806383-022	Prime 6	12-20	8.0	0.58	34.3	21.4	3.14	2.44	0.17	0.10
S1806383-023	Prime 6	20-36	8.2	0.35	33.2	22.7	1.71	1.93	0.24	0.18
S1806383-024	Prime 6	36-48	8.3	0.34	23.0	12.0	1.58	2.23	0.26	0.19
S1806383-025	Prime 7	0-12	7.9	0.65	35.7	21.4	4.46	1.63	0.21	0.12
S1806383-026	Prime 7	12-24	8.1	0.57	46.1	32.6	2.57	3.07	0.50	0.30
S1806383-027	Prime 7	24-36	8.2	3.65	30.7	23.1	3.23	32.1	10.8	2.57
S1806383-028	Prime 7	36-48	8.2	5.95	29.8	22.8	5.97	52.2	23.8	4.41
S1806383-029	Prime 8	0-12	7.9	0.57	40.4	31.2	3.24	2.58	0.26	0.15
S1806383-030	Prime 8	12-20	8.2	0.36	37.0	27.0	1.73	1.50	0.18	0.14
S1806383-031	Prime 8	20-32	8.0	0.43	35.9	25.6	2.01	2.18	0.22	0.15
S1806383-032	Prime 8	32-48	8.1	0.30	27.8	21.9	1.86	1.98	0.33	0.24
S1806383-033	Prime 9	0-12	8.0	0.56	47.5	27.5	3.29	2.03	0.29	0.18
S1806383-034	Prime 9	12-20	8.2	0.43	60.8	26.0	2.41	2.13	0.17	0.11
S1806383-035	Prime 9	20-32	8.3	0.65	34.8	27.4	1.85	4.70	0.54	0.30
S1806383-036	Prime 9	32-48	8.4	1.30	26.7	20.6	1.48	10.7	0.77	0.31
S1806383-037	Prime 10	0-12	7.8	1.02	34.1	26.9	5.76	4.77	0.17	0.07
S1806383-038	Prime 10	12-24	8.2	0.50	30.6	23.8	1.98	2.86	0.27	0.18
S1806383-039	Prime 10	24-36	8.2	0.40	28.9	22.3	1.80	2.41	0.37	0.26
S1806383-040	Prime 10	36-48	8.2	0.38	26.3	14.7	1.08	2.37	0.25	0.19

These results apply only 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, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Soil Analysis Report

Alton Coal Development, LLC

463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1806383001

Project: Coal Hollow Mine

Date Received: 6/22/2018

Date Reported: 8/1/2018

Work Order: S1806383

Lab ID	Sample ID	Depths Inches	pH s.u.	Electrical Conductivity dS/m	Field Capacity %	Wilting Point %	Calcium PE meq/L	Magnesium PE meq/L	Sodium PE meq/L	SAR
S1806383-041	Prime 11	0-12	7.6	0.64	34.9	17.9	3.68	2.47	0.16	0.09
S1806383-042	Prime 11	12-18	7.9	0.74	35.5	23.3	4.17	3.85	0.36	0.18
S1806383-043	Prime 11	18-30	8.2	0.41	29.1	21.0	2.24	2.59	0.23	0.15
S1806383-044	Prime 11	30-48	8.3	0.42	29.0	18.7	1.31	3.13	0.25	0.17
S1806383-045	Prime 12	0-12	7.8	0.66			3.95	1.96	0.15	0.09
S1806383-046	Prime 12	12-24	8.1	0.54	27.3	8.5	2.61	2.35	0.15	0.09
S1806383-047	Prime 12	24-36	8.0	0.55	33.4	21.5	2.15	3.58	0.37	0.22
S1806383-048	Prime 12	36-48	8.3	0.88	35.2	26.6	2.67	6.64	0.89	0.41

These results apply only 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, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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Alton Coal Development, LLC
463 North 100 West
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Report ID: S1806383001

Project: Coal Hollow Mine
Date Received: 6/22/2018

Date Reported: 8/1/2018
Work Order: S1806383

Lab ID	Sample ID	Depths Inches	Sand %	Silt %	Clay %	Texture	Bulk Density g/cm³
S1806383-001	Prime 1	0-12	9.0	43.0	48.0	Silty Clay	3.78
S1806383-002	Prime 1	12-24	3.0	60.0	37.0	Silty Clay Loam	3.05
S1806383-003	Prime 1	24-36	<0.1	62.0	38.0	Silty Clay Loam	2.69
S1806383-004	Prime 1	36-48	3.0	67.0	30.0	Silty Clay Loam	3.13
S1806383-005	Prime 2	0-12	17.0	50.0	33.0	Silty Clay Loam	12.3
S1806383-006	Prime 2	12-20	6.0	55.0	39.0	Silty Clay Loam	3.98
S1806383-007	Prime 2	20-32	<0.1	48.0	52.0	Silty Clay	2.82
S1806383-008	Prime 2	32-48	1.0	53.0	46.0	Silty Clay	3.19
S1806383-009	Prime 3	0-12	14.0	50.0	36.0	Silty Clay Loam	10.5
S1806383-010	Prime 3	12-18	10.0	46.0	44.0	Silty Clay	8.77
S1806383-011	Prime 3	18-30	6.0	59.0	35.0	Silty Clay Loam	3.90
S1806383-012	Prime 3	30-48	1.0	65.0	34.0	Silty Clay Loam	2.91
S1806383-013	Prime 4	0-12	18.0	48.0	34.0	Silty Clay Loam	3.82
S1806383-014	Prime 4	12-24	9.0	60.0	31.0	Silty Clay Loam	4.27
S1806383-015	Prime 4	24-36	5.0	71.0	24.0	Silty Loam	3.79
S1806383-016	Prime 4	36-48	65.0	25.0	10.0	Sandy Loam	3.68
S1806383-017	Prime 5	0-12	43.0	37.0	20.0	Loam	3.08
S1806383-018	Prime 5	12-18	12.0	47.0	41.0	Silty Clay	3.17
S1806383-019	Prime 5	18-30	<0.1	57.0	43.0	Silty Clay	3.23
S1806383-020	Prime 5	30-48	12.0	63.0	25.0	Silty Loam	3.67

These results apply only 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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Karen Secor, Soil Lab Supervisor

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463 North 100 West
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Report ID: S1806383001

Project: Coal Hollow Mine
Date Received: 6/22/2018

Date Reported: 8/1/2018
Work Order: S1806383

Lab ID	Sample ID	Depths Inches	Sand %	Silt %	Clay %	Texture	Bulk Density g/cm³
S1806383-021	Prime 6	0-12	46.0	37.0	17.0	Loam	3.60
S1806383-022	Prime 6	12-20	14.0	49.0	37.0	Silty Clay Loam	4.75
S1806383-023	Prime 6	20-36	8.0	56.0	36.0	Silty Clay Loam	3.10
S1806383-024	Prime 6	36-48	44.0	34.0	22.0	Loam	3.01
S1806383-025	Prime 7	0-12	33.0	32.0	35.0	Clay Loam	5.13
S1806383-026	Prime 7	12-24	4.0	42.0	54.0	Silty Clay	4.17
S1806383-027	Prime 7	24-36	<0.1	50.0	50.0	Silty Clay	2.70
S1806383-028	Prime 7	36-48	<0.1	54.0	46.0	Silty Clay	2.66
S1806383-029	Prime 8	0-12	8.0	51.0	41.0	Silty Clay	5.96
S1806383-030	Prime 8	12-20	7.0	50.0	43.0	Silty Clay	5.16
S1806383-031	Prime 8	20-32	17.0	41.0	42.0	Silty Clay	3.67
S1806383-032	Prime 8	32-48	<0.1	56.0	44.0	Silty Clay	2.78
S1806383-033	Prime 9	0-12	14.0	48.0	38.0	Silty Clay Loam	24.5
S1806383-034	Prime 9	12-20	14.0	59.0	27.0	Silty Clay Loam	6.51
S1806383-035	Prime 9	20-32	4.0	49.0	47.0	Silty Clay	2.94
S1806383-036	Prime 9	32-48	1.0	64.0	35.0	Silty Clay Loam	2.46
S1806383-037	Prime 10	0-12	9.0	49.0	42.0	Silty Clay	3.55
S1806383-038	Prime 10	12-24	1.0	65.0	34.0	Silty Clay Loam	3.52
S1806383-039	Prime 10	24-36	3.0	61.0	36.0	Silty Clay Loam	2.97
S1806383-040	Prime 10	36-48	13.0	62.0	25.0	Silty Loam	3.15

These results apply only 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, Neutral. Pot.= Neutralization Potential
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Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Alton Coal Development, LLC

463 North 100 West
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Report ID: S1806383001

Project: Coal Hollow Mine

Date Received: 6/22/2018

Date Reported: 8/1/2018

Work Order: S1806383

Lab ID	Sample ID	Depths Inches	Sand %	Silt %	Clay %	Texture	Bulk Density g/cm³
S1806383-041	Prime 11	0-12	26.0	45.0	29.0	Clay Loam	3.51
S1806383-042	Prime 11	12-18	15.0	45.0	40.0	Silty Clay	3.46
S1806383-043	Prime 11	18-30	3.0	63.0	34.0	Silty Clay Loam	3.07
S1806383-044	Prime 11	30-48	5.0	66.0	29.0	Silty Clay Loam	3.05
S1806383-045	Prime 12	0-12	49.0	37.0	14.0	Loam	3.49
S1806383-046	Prime 12	12-24	53.0	32.0	15.0	Sandy Loam	2.79
S1806383-047	Prime 12	24-36	21.0	42.0	37.0	Clay Loam	3.12
S1806383-048	Prime 12	36-48	1.0	56.0	43.0	Silty Clay	3.00

These results apply only 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, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

All shaded fields must be completed.
This is a legal document; any misrepresentation may be construed as fraud.

WEB

1 of 6

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address	Contact Name and Email
463 N 100 W, Suite 1 Cedar City, Utah 84721	Kirk Nicholes Voice FAX knicholes@altoncoal.com
Invoice Address	**Purchase Order #** / **Quote #**
Same	

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	S1806383	6/11/2018		Prime 1 0-12"	SL	1	X	X	X	X	X	X
2				12-24"		1	X	X	X	X	X	X
3				24-36"		1	X	X	X	X	X	X
4				36-48"		1	X	X	X	X	X	X
5				Prime 2 0-12"		1	X	X	X	X	X	X
6				12-20"		1	X	X	X	X	X	X
7				20-32"		1	X	X	X	X	X	X
8				32-48"		1	X	X	X	X	X	X
9				~~Prime 3 0-12"~~								
10				~~12-18"~~								
11				~~18-30"~~								
12				~~30-48"~~								
13				~~Prime 4 0-12"~~								
14												

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	6/20/18	7:00	Karen A Secor	6/22/18	1030

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☑ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☑ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab	Client	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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WEB

2 of 6

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address
463 N 100 W, Suite 1
Cedar City, Utah 84721

Contact Name and Email
Kirk Nicholes
Voice
FAX knicholes@altoncoal.com

Invoice Address
Same

Purchase Order #

Quote #

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	5180383	6/11/2018		Prime 3 0-12"	SL	1	X	X	X	X	X	X
2				12-18"		1	X	X	X	X	X	X
3				18-30"		1	X	X	X	X	X	X
4				30-48"		1	X	X	X	X	X	X
5				Prime 4 0-12"		1	X	X	X	X	X	X
6				12-24		1	X	X	X	X	X	X
7				24-36"		1	X	X	X	X	X	X
8				36-48"								
9												
10												
11												
12												
13												
14												

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	6/20/18	7:00	Karen A Secu	6/22/18	1030

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ URGENT - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab	Client	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

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Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address
463 N 100 W, Suite 1
Cedar City, Utah 84721

Contact Name and Email
Kirk Nicholes
Voice
FAX knicholes@altoncoal.com

Invoice Address
Same

Purchase Order #

Quote #

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	S1806383	6/11/2018		Prime 5 0-12"	SL	1	X	X	X	X	X	X
2				12-18"		1	X	X	X	X	X	X
3				18-30"		1	X	X	X	X	X	X
4				30-48"		1	X	X	X	X	X	X
5		6-13-18		Prime 6 0-12"		1	X	X	X	X	X	X
6				12-20"		1	X	X	X	X	X	X
7				20-36"		1	X	X	X	X	X	X
8				36-48"		1	X	X	X	X	X	X
9												
10												
11												
12												
13												
14												

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	6/20/18	7:00	Karen A Serna	6/22/18	1630

SHIPPING INFO
- [x] UPS
- [ ] Fed Express
- [ ] US Mail
- [ ] Hand Carried
- [ ] Other_____

MATRIX CODES

Water	WT
Soil	SL
Solid	SD
Trip Blank	TB
Other	OT

TURN AROUND TIMES
Check desired service
- [x] Standard turnaround
- [ ] **RUSH** - 5 Working Days
- [ ] **URGENT** - < 2 Working Days

Rush & Urgent Surcharges will be applied

COMPLIANCE INFORMATION

Compliance Monitoring ?	Y / N
Program (SDWA, NPDES, ...)	
PWSID / Permit #	
Chlorinated?	Y / N
Sample Disposal: Lab	Client

ADDITIONAL REMARKS

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

All shaded fields must be completed.
This is a legal document; any misrepresentation may be construed as fraud.

WEB

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address
463 N 100 W, Suite 1
Cedar City, Utah 84721

Contact Name and Email
Kirk Nicholes
Voice
FAX knicholes@altoncoal.com

Invoice Address
Same

Purchase Order #

Quote #

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water							
1	S1806383	6/11/2018		Prime 7 0-12"	SL	1	X	X	X	X	X	X							
2				12-24"		1	X	X	X	X	X	X							
3				24-36"		1	X	X	X	X	X	X							
4				36-48"		1	X	X	X	X	X	X							
5				Prime 8 0-12"		1	X	X	X	X	X	X							
6				12-20"		1	X	X	X	X	X	X							
7				20-32"		1	X	X	X	X	X	X							
8				32-48"		1	X	X	X	X	X	X							
9																			
10																			
11																			
12																			
13																			
14																			

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	6/20/18	7:00	Karen A Sea	6/22/18	1030

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☑ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☑ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab	Client	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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WEB

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address
463 N 100 W, Suite 1
Cedar City, Utah 84721

Contact Name and Email
Kirk Nicholes
Voice
FAX knicholes@altoncoal.com

Invoice Address
Same

Purchase Order #

Quote #

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water							
1	5180383	6/11/2018		Prime 9 0-12"	SC	1	X	X	X	X	X	X							
2				12-20"		1	X	X	X	X	X	X							
3				20-32"		1	X	X	X	X	X	X							
4				32-48"		1	X	X	X	X	X	X							
5				Prime 10 0-12"		1	X	X	X	X	X	X							
6				12-24"		1	X	X	X	X	X	X							
7				24-36"		1	X	X	X	X	X	X							
8				36-48"		1	X	X	X	X	X	X							
9																			
10																			
11																			
12																			
13																			
14																			

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	6/20/18	7:00	Karen A Sorn	6/22/18	1030

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☒ UPS	Water	WT	Check desired service	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☑ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ RUSH - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ URGENT - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab	Client	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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WEB

6 of 6

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address	Contact Name and Email
463 N 100 W, Suite 1 Cedar City, Utah 84721	Kirk Nicholes Voice FAX knicholes@altoncoal.com
Invoice Address	**Purchase Order #** / **Quote #**
Same	

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	S1806383	6/11/2018		Prime 11 0 - 12"	SL	1	X	X	X	X	X	X
2				12 - 18"		1	X	X	X	X	X	X
3				18 - 30"		1	X	X	X	X	X	X
4				30 - 48"		1	X	X	X	X	X	X
5		6/13/18		Prime 12 0 - 12"		1	X	X	X	X	X	X
6				12 - 24"		1	X	X	X	X	X	X
7				24 - 36"		1	X	X	X	X	X	X
8				36 - 48"		1	X	X	X	X	X	X
9												
10												
11												
12												
13												
14												

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	6/20/18	7:00	Karen Sea	6/22/18	1030

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☒ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	*Rush & Urgent Surcharges will be applied*	Sample Disposal: Lab	Client	

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 11/1/2018

CLIENT: Alton Coal Development, LLC
Project: Coal Hollow Mine
Lab Order: S1809272

CASE NARRATIVE

Report ID: S1809272001

Samples Prime #13, Prime #14, Prime #15, Prime #16, Prime #17, Prime #18, Prime #19, Prime #20, Prime #21, Prime #22 and Prime #23 were received on September 18, 2018.

Samples were analyzed using the methods outlined in the following references:

U.S.E.P.A. 600/2-78-054 "Field and Laboratory Methods Applicable to Overburden and Mining Soils", 1978
American Society of Agronomy, Number 9, Part 2, 1982
USDA Handbook 60 "Diagnosis and Improvement of Saline and Alkali Soils", 1969
Wyoming Department of Environmental Quality, Land Quality Division, Guideline No. 1, 1984
New Mexico Overburden and Soils Inventory and Handling Guideline, March 1987
State of Utah, Division of Oil, Gas, and Mining: Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, April 1988
Montana Department of State Lands, Reclamation Division: Soil, Overburden, and Regraded Spoil Guidelines, December 1994
State of Nevada Modified Sobek Procedure
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Bulk density analysis was unable to be performed on the following samples due to lack of suitable sample required by the method: Prime #15 (0-12"), Prime #16 (0-12 and 12-24"), Prime #18 (0-12"), Prime #19 (12-24"), Prime #21 (0-12"), and Prime #23 (12-24").

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Soil Analysis Report

Alton Coal Development, LLC
463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1809272001

Project: Coal Hollow Mine
Date Received: 9/18/2018

Date Reported: 11/1/2018
Work Order: S1809272

Lab ID	Sample ID	Depths Inches	pH s.u.	Electrical Conductivity dS/m	Field Capacity %	Wilting Point %	Calcium PE meq/L	Magnesium PE meq/L	Sodium PE meq/L	SAR
S1809272-001	Prime #13	0-12	7.8	0.67	38.1	26.0	3.41	3.52	0.87	0.47
S1809272-002	Prime #13	12-24	8.3	0.43	29.1	11.8	1.27	2.88	0.81	0.56
S1809272-003	Prime #13	24-36	8.5	0.48	31.7	23.3	2.04	3.95	1.13	0.65
S1809272-004	Prime #13	36-48	8.7	0.45	31.1	22.2	1.16	3.02	1.56	1.08
S1809272-005	Prime #14	0-12	7.9	0.47	41.0	29.8	3.37	2.17	0.37	0.22
S1809272-006	Prime #14	12-24	8.0	0.43	37.8	25.4	2.63	2.19	0.28	0.18
S1809272-007	Prime #14	24-36	8.2	0.35	46.6	22.7	1.60	2.36	0.35	0.25
S1809272-008	Prime #14	36-48	8.4	0.39	33.8	25.0	1.01	3.11	0.49	0.34
S1809272-009	Prime #15	0-12	7.9	0.44	40.7	28.7	3.12	1.75	0.12	0.08
S1809272-010	Prime #15	12-24	8.2	0.34	25.8	17.5	2.07	1.51	0.24	0.18
S1809272-011	Prime #15	24-36	8.4	0.29	34.1	25.4	1.53	1.73	0.37	0.29
S1809272-012	Prime #15	36-48	8.5	0.34	31.2	22.8	1.42	2.48	0.42	0.30
S1809272-013	Prime #16	0-12	7.7	0.62	44.0	27.5	4.04	2.79	0.18	0.09
S1809272-014	Prime #16	12-24	7.5	0.61	38.0	25.8	3.98	2.83	0.13	0.07
S1809272-015	Prime #16	24-36	8.0	0.35	35.7	28.0	2.53	1.63	0.12	0.09
S1809272-016	Prime #16	36-48	8.2	0.31	37.9	30.8	1.91	1.61	0.13	0.10
S1809272-017	Prime #17	0-12	7.8	0.71	35.4	25.3	4.05	3.40	0.15	0.08
S1809272-018	Prime #17	12-24	8.1	0.40	37.0	25.2	2.41	2.41	0.18	0.11
S1809272-019	Prime #17	24-36	8.4	0.29	27.4	19.9	1.02	2.31	0.24	0.19
S1809272-020	Prime #17	36-48	8.5	0.30	21.8	7.8	1.01	2.56	0.28	0.21

These results apply only 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, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Soil Analysis Report

Alton Coal Development, LLC
463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1809272001

Project: Coal Hollow Mine
Date Received: 9/18/2018

Date Reported: 11/1/2018
Work Order: S1809272

Lab ID	Sample ID	Depths Inches	pH s.u.	Electrical Conductivity dS/m	Field Capacity %	Wilting Point %	Calcium PE meq/L	Magnesium PE meq/L	Sodium PE meq/L	SAR
S1809272-021	Prime #18	0-12	7.6	0.40	33.1	26.4	2.94	2.05	0.27	0.17
S1809272-022	Prime #18	12-24	8.0	0.37	32.5	23.1	2.16	2.20	0.19	0.13
S1809272-023	Prime #18	24-36	8.1	0.32	28.6	18.9	1.34	1.83	0.44	0.35
S1809272-024	Prime #18	36-48	8.1	0.33	22.6	10.9	1.19	1.97	0.52	0.41
S1809272-025	Prime #19	0-12	7.6	0.59	41.2	35.6	3.34	2.71	0.55	0.32
S1809272-026	Prime #19	12-24	8.0	0.39	43.2	27.8	2.03	2.0	0.48	0.34
S1809272-027	Prime #19	24-36	8.3	0.39	39.1	28.3	0.96	2.74	0.58	0.42
S1809272-028	Prime #19	36-48	8.4	0.36	29.0	22.0	1.32	2.69	0.68	0.48
S1809272-029	Prime #20	0-12	7.7	0.56	40.6	29.4	3.59	1.46	0.63	0.40
S1809272-030	Prime #20	12-24	7.9	0.41	38.5	29.8	2.22	2.01	0.49	0.34
S1809272-031	Prime #20	24-36	8.0	0.40	43.7	27.5	1.78	2.55	0.52	0.35
S1809272-032	Prime #20	36-48	8.3	0.41	31.9	23.8	1.26	2.85	0.60	0.42
S1809272-033	Prime #21	0-12	7.8	0.73	44.3	31.1	4.11	2.60	0.56	0.31
S1809272-034	Prime #21	12-24	8.1	0.34	36.3	25.8	1.56	1.65	0.48	0.38
S1809272-035	Prime #21	24-36	8.4	0.33	25.9	18.9	1.18	2.73	0.51	0.36
S1809272-036	Prime #21	36-48	8.4	0.33	26.0	19.1	1.16	2.89	0.52	0.37
S1809272-037	Prime #22	0-12	7.8	0.61	35.7	25.8	3.60	2.74	0.51	0.29
S1809272-038	Prime #22	12-24	7.8	0.52	40.4	21.8	2.45	3.22	0.53	0.32
S1809272-039	Prime #22	24-36	8.2	0.38	28.1	21.4	1.56	2.51	0.50	0.35
S1809272-040	Prime #22	36-48	8.3	0.40	24.5	16.3	1.55	2.83	0.52	0.35

These results apply only 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, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Your Environmental Monitoring Partner

Soil Analysis Report

Alton Coal Development, LLC

463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1809272001

Project: Coal Hollow Mine

Date Received: 9/18/2018

Date Reported: 11/1/2018

Work Order: S1809272

Lab ID	Sample ID	Depths Inches	pH s.u.	Electrical Conductivity dS/m	Field Capacity %	Wilting Point %	Calcium PE meq/L	Magnesium PE meq/L	Sodium PE meq/L	SAR
S1809272-041	Prime #23	0-12	7.6	0.63	36.8	25.9	3.89	2.79	0.41	0.23
S1809272-042	Prime #23	12-24	7.8	0.50	35.5	28.3	2.66	2.73	0.44	0.27
S1809272-043	Prime #23	24-36	8.2	0.32	30.1	22.1	1.87	2.38	0.48	0.33
S1809272-044	Prime #23	36-48	8.5	0.30	25.8	16.0	0.88	2.18	0.51	0.41

These results apply only 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: Karen A Secor

Karen Secor, Soil Lab Supervisor

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Soil Analysis Report

Alton Coal Development, LLC
463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1809272001

Project: Coal Hollow Mine
Date Received: 9/18/2018

Date Reported: 11/1/2018
Work Order: S1809272

Lab ID	Sample ID	Depths Inches	Sand %	Silt %	Clay %	Texture	Bulk Density g/cm³
S1809272-001	Prime #13	0-12	9.0	46.0	45.0	Silty Clay	7.08
S1809272-002	Prime #13	12-24	50.0	27.0	23.0	Sandy Clay Loam	3.53
S1809272-003	Prime #13	24-36	<0.1	46.0	54.0	Silty Clay	2.66
S1809272-004	Prime #13	36-48	3.0	55.0	42.0	Silty Clay	3.12
S1809272-005	Prime #14	0-12	15.0	42.0	43.0	Silty Clay	7.63
S1809272-006	Prime #14	12-24	12.0	48.0	40.0	Silty Clay	6.94
S1809272-007	Prime #14	24-36	29.0	35.0	36.0	Clay Loam	3.66
S1809272-008	Prime #14	36-48	1.0	49.0	50.0	Silty Clay	2.74
S1809272-009	Prime #15	0-12	12.0	51.0	37.0	Silty Clay Loam	
S1809272-010	Prime #15	12-24	35.0	34.0	31.0	Clay Loam	3.38
S1809272-011	Prime #15	24-36	9.0	42.0	49.0	Silty Clay	2.83
S1809272-012	Prime #15	36-48	<0.1	48.0	52.0	Silty Clay	2.75
S1809272-013	Prime #16	0-12	11.0	49.0	40.0	Silty Clay	
S1809272-014	Prime #16	12-24	12.0	47.0	41.0	Silty Clay	
S1809272-015	Prime #16	24-36	10.0	48.0	42.0	Silty Clay	4.96
S1809272-016	Prime #16	36-48	14.0	44.0	42.0	Silty Clay	5.32
S1809272-017	Prime #17	0-12	11.0	46.0	43.0	Silty Clay	3.81
S1809272-018	Prime #17	12-24	9.0	47.0	44.0	Silty Clay	4.71
S1809272-019	Prime #17	24-36	8.0	63.0	29.0	Silty Clay Loam	3.96
S1809272-020	Prime #17	36-48	44.0	43.0	13.0	Loam	3.82

These results apply only 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, Neutral. Pot.= Neutralization Potential
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Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Your Environmental Monitoring Partner

Soil Analysis Report

Alton Coal Development, LLC

463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1809272001

Project: Coal Hollow Mine
Date Received: 9/18/2018

Date Reported: 11/1/2018
Work Order: S1809272

Lab ID	Sample ID	Depths Inches	Sand %	Silt %	Clay %	Texture	Bulk Density g/cm³
S1809272-021	Prime #18	0-12	11.0	50.0	39.0	Silty Clay Loam	
S1809272-022	Prime #18	12-24	4.0	64.0	32.0	Silty Clay Loam	4.95
S1809272-023	Prime #18	24-36	1.0	66.0	33.0	Silty Clay Loam	3.28
S1809272-024	Prime #18	36-48	24.0	54.0	22.0	Silty Loam	3.04
S1809272-025	Prime #19	0-12	13.0	38.0	49.0	Clay	5.06
S1809272-026	Prime #19	12-24	14.0	41.0	45.0	Silty Clay	
S1809272-027	Prime #19	24-36	8.0	43.0	49.0	Silty Clay	6.36
S1809272-028	Prime #19	36-48	2.0	56.0	42.0	Silty Clay	2.63
S1809272-029	Prime #20	0-12	17.0	36.0	47.0	Clay	5.06
S1809272-030	Prime #20	12-24	4.0	50.0	46.0	Silty Clay	5.47
S1809272-031	Prime #20	24-36	14.0	39.0	47.0	Clay	6.36
S1809272-032	Prime #20	36-48	<0.1	50.0	50.0	Silty Clay	2.52
S1809272-033	Prime #21	0-12	18.0	38.0	44.0	Clay	
S1809272-034	Prime #21	12-24	6.0	49.0	45.0	Silty Clay	2.91
S1809272-035	Prime #21	24-36	7.0	57.0	36.0	Silty Clay Loam	2.99
S1809272-036	Prime #21	36-48	<0.1	64.0	36.0	Silty Clay Loam	2.77
S1809272-037	Prime #22	0-12	10.0	42.0	48.0	Silty Clay	3.78
S1809272-038	Prime #22	12-24	23.0	36.0	41.0	Clay	2.85
S1809272-039	Prime #22	24-36	11.0	49.0	40.0	Silty Clay	2.76
S1809272-040	Prime #22	36-48	16.0	58.0	26.0	Silty Loam	2.74

These results apply only 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, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Soil Analysis Report

Alton Coal Development, LLC

463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1809272001

Project: Coal Hollow Mine
Date Received: 9/18/2018

Date Reported: 11/1/2018
Work Order: S1809272

Lab ID	Sample ID	Depths Inches	Sand %	Silt %	Clay %	Texture	Bulk Density g/cm³
S1809272-041	Prime #23	0-12	14.0	40.0	46.0	Silty Clay	6.22
S1809272-042	Prime #23	12-24	4.0	43.0	53.0	Silty Clay	
S1809272-043	Prime #23	24-36	<0.1	56.0	44.0	Silty Clay	2.99
S1809272-044	Prime #23	36-48	7.0	67.0	26.0	Silty Loam	2.84

These results apply only 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, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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This is a legal document; any misrepresentation may be construed as fraud.

WEB
Page 1 of 5

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address	Contact Name and Email	
463 N 100 W, Suite 1 Cedar City, Utah 84721	Kirk Nicholes	
	Voice	
	FAX	knicholes@altoncoal.com
Invoice Address	**Purchase Order #**	**Quote #**
Same		

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	51809272	8-18-18		Prime #13 0-12"	SL	1	X	X	X	X	X	X
2				12"-24"		1	X	X	X	X	X	X
3				24"-36"		1	X	X	X	X	X	X
4				36"-48"		1	X	X	X	X	X	X
5				Prime #14 0-12"		1	X	X	X	X	X	X
6				12"-24"		1	X	X	X	X	X	X
7				24"-36"		1	X	X	X	X	X	X
8				36"-48"		1	X	X	X	X	X	X
9												
10												
11												
12												
13												
14												

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	9/14/18		Kara Alea	9/18/18	1053

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☒ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	***Rush & Urgent Surcharges will be applied***	Sample Disposal: Lab ____	Client ____	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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2 of 5

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address
463 N 100 W, Suite 1
Cedar City, Utah 84721

Contact Name and Email
Kirk Nicholes
Voice
FAX knicholes@altoncoal.com

Invoice Address
Same

Purchase Order #

Quote #

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water							
1	51809272	8-16-18		Prime #15 0-12	SL	1	X	X	X	X	X	X							
2				12"-24		1	X	X	X	X	X	X							
3				24"-36"		1	X	X	X	X	X	X							
4				36"-48"		1	X	X	X	X	X	X							
5				Prime #16 0-12"		1	X	X	X	X	X	X							
6				12"-24"		1	X	X	X	X	X	X							
7				24"-36"		1	X	X	X	X	X	X							
8				36"-48"		1	X	X	X	X	X	X							
9																			
10																			
11																			
12																			
13																			
14																			

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	9/14/18		Karen A Sean	9/18/18	1053

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☒ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	***Rush & Urgent Surcharges will be applied***	Sample Disposal: Lab ____	Client ____	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

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3 of 5

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address	Contact Name and Email
463 N 100 W, Suite 1 Cedar City, Utah 84721	Kirk Nicholes Voice FAX knicholes@altoncoal.com
Invoice Address	**Purchase Order #** / **Quote #**
Same	

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	51809272	8-16-18		Prime #17 0-12"	SL	1	X	X	X	X	X	X
2				#2		1	X	X	X	X	X	X
3				#3		1	X	X	X	X	X	X
4				#4		1	X	X	X	X	X	X
5		8-18-18		Prime #18 #1		1	X	X	X	X	X	X
6				#2		1	X	X	X	X	X	X
7				#3		1	X	X	X	X	X	X
8				#4		1	X	X	X	X	X	X
9												
10												
11												
12												
13												
14												

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	9/14/18		Karen A Sec	9/18/18	1053

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☑ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☑ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	***Rush & Urgent Surcharges will be applied***	Sample Disposal: Lab ____	Client ____	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

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4 of 5

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address	Contact Name and Email
463 N 100 W, Suite 1 Cedar City, Utah 84721	Kirk Nicholes Voice FAX knicholes@altoncoal.com
Invoice Address	**Purchase Order #** / **Quote #**
Same	

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	51809272	8-16-17		Prime 19 #1	SL	1	X	X	X	X	X	X
2				#2		1	X	X	X	X	X	X
3				#3		1	X	X	X	X	X	X
4				#4		1	X	X	X	X	X	X
5				Prime 28 #1		1	X	X	X	X	X	X
6				#2		1	X	X	X	X	X	X
7				#3		1	X	X	X	X	X	X
8				#4		1	X	X	X	X	X	X
9												
10												
11												
12												
13												
14												

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	9/14/18		Kane Abe	9/18/18	1053

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☑ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☑ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	***Rush & Urgent Surcharges will be applied***	Sample Disposal: Lab	Client	

Inter-Mountain Labs, Inc.
Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

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5 of 5

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Alton Coal Development, LLC	Coal Hollow Mine		435-691-1551

Report Address: 463 N 100 W, Suite 1, Cedar City, Utah 84721

Contact Name and Email: Kirk Nicholes; Voice; FAX; knicholes@altoncoal.com

Invoice Address: Same

Purchase Order #:

Quote #:

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION		Matrix	# of Containers	pH	Density	SAR	EC	Texture	Available Water
1	5189272	8-16-18		Prime #21	#1	SG	1	X	X	X	X	X	X
2					#2		1	X	X	X	X	X	X
3					#3		1	X	X	X	X	X	X
4					#4		1	X	X	X	X	X	X
5				Prime #22	#1		1	X	X	X	X	X	X
6					#2		1	X	X	X	X	X	X
7					#3		1	X	X	X	X	X	X
8					#4		1	X	X	X	X	X	X
9		8-21-18		Prime #23	#1		1	X	X	X	X	X	X
10					#2		1	X	X	X	X	X	X
11					#3		1	X	X	X	X	X	X
12					#4		1	X	X	X	X	X	X
13													
14													

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	B. Kirk Nicholes /B. Kirk Nicholes	9/14/18		Karen Allen	9/18/18	1053

SHIPPING INFO	MATRIX CODES		TURN AROUND TIMES	COMPLIANCE INFORMATION		ADDITIONAL REMARKS
☑ UPS	Water	WT	**Check desired service**	Compliance Monitoring ?	Y / N	
☐ Fed Express	Soil	SL	☐ Standard turnaround	Program (SDWA, NPDES, ...)		
☐ US Mail	Solid	SD	☐ **RUSH** - 5 Working Days	PWSID / Permit #		
☐ Hand Carried	Trip Blank	TB	☐ **URGENT** - < 2 Working Days	Chlorinated?	Y / N	
☐ Other_____	Other	OT	***Rush & Urgent Surcharges will be applied***	Sample Disposal: Lab	Client	

Appendix D

Gem Engineering, LLC
Field Density Test Summary Sheets

Field Density Test Summary

GEM ENGINEERING, INC.
485 North Aviation Way ♦ Cedar City, UT 84721
Phone (435) 867-6478 ♦ Fax (435) 867-4372
www.gemengineeringinc.com

Client: Alton Coal Development

Project #:

Project Name & Location: Alton Coal Mine

Contractor:

Weather:

Equipment used:

Field Density Tests: For:

Test Date	Test No.	Test Location	Elev.	Laboratory Data		Field Data		% Comp	% Req'd
				Lab Max Dry Density	Optimum Moisture	Dry Density	Moisture Content		
6/5/18	1	Prime 1	- 6"	102.5	18.0%	76.7	18.3%	75	
6/5/18	2	Prime 1	- 18"	115.0	14.0%	98.5	10.3%	86	
6/5/18	3	Prime 1	- 32"	115.0	14.0%	103.4	11.4%	90	
6/5/18	4	Prime 1	- 60"	115.0	14.0%	101.2	17.5%	88	
6/5/18	5	Prime 2	- 6"	102.5	18.0%	70.5	12.1%	69	
6/5/18	6	Prime 2	- 20"	115.0	14.0%	93.8	18.7%	82	
6/5/18	7	Prime 2	- 38"	115.0	14.0%	87.4	14.1%	76	
6/5/18	8	Prime 2	- 53"	115.0	14.0%	100.3	15.9%	87	
6/5/18	9	Prime 3	- 6"	102.5	18.0%	72.1	13.8%	70	
6/5/18	10	Prime 3	- 18"	115.0	14.0%	79.9	15.9%	69	
6/5/18	11	Prime 3	- 36"	115.0	14.0%	92.4	13.2%	80	
6/5/18	12	Prime 3	- 53"	115.0	14.0%	96.1	17.0%	84	
6/5/18	13	Prime 7	- 6"	102.5	18.0%	84.4	11.3%	82	
6/5/18	14	Prime 7	- 14"	115.0	14.0%	90.6	10.0%	79	
6/5/18	15	Prime 7	- 32"	115.0	14.0%	100.5	17.1%	87	
6/5/18	16	Prime 7	- 48"	115.0	14.0%	103.9	15.6%	90	
6/5/18	17	Prime 8	- 6"	102.5	18.0%	76.6	15.7%	75	
6/5/18	18	Prime 8	- 18"	102.5	18.0%	78.2	14.9%	76	
6/5/18	19	Prime 8	- 38"	115.0	14.0%	95.6	17.9%	83	
6/5/18	20	Prime 8	- 53"	no test same material					

Gauge:

Density Standard Count:

Moisture Standard Count:

(x) Client's representative was advised of the test results.

GEM Engineering, Inc. **Representative**

Received by: _____ **Technician(s):** Pat Shannon

Representing: _____ **Reviewed by:** _____

Abbreviations: ABC=aggregate base course AC=asphalt concrete BBOF=below bottom of footing BFG=below finish grade BG=below grade BOC=back of curb BOF=bottom of footing BRG=below rough grade BSC=bituminous surface course BSG=below sub grade CL=centerline EL=elevation FG=finished grade FSG=finished sub grade LT=left MH=manhole NSG=native sub grade PC=property corner PL=property line PZ=pipe zone RG=rough grade RT=right SG=sub grade SL=sewer line STA=station WL=water line

Compaction test results reflect the tested fill at the location existing on this date. Test locations and elevations are approximate. No other warranty either expressed or implied is provided.

Field Density Test Summary

GEM ENGINEERING, INC.
485 North Aviation Way ♦ Cedar City, UT 84721
Phone (435) 867-6478 ♦ Fax (435) 867-4372
www.gemengineeringinc.com

Client: Alton Coal Development

Project #:

Project Name & Location: Alton Coal Mine

Contractor:

Weather:

Equipment used:

Field Density Tests: For:

Test Date	Test No.	Test Location	Elev.	Laboratory Data: Lab Max Dry Density	Laboratory Data: Optimum Moisture	Field Data: Dry Density	Field Data: Moisture Content	% Comp	% Req'd
6/5/18	21	Prime 9	- 6"	102.5	18.0%	73.2	12.8%	71	
6/5/18	22	Prime 9	- 20"	102.5	18.0%	57.7	13.5%	56	
6/5/18	23	Prime 9	- 36"	115.0	14.0%	96.4	18.7%	84	
6/5/18	24	Prime 9	- 56"	115.0	14.0%	98.0	15.3%	85	
6/5/18	25	Prime 4	- 6"	102.5	18.0%	86.9	9.0%	85	
6/5/18	26	Prime 4	- 18"	102.5	18.0%	80.7	10.5%	79	
6/5/18	27	Prime 4	- 28"	115.0	14.0%	85.0	6.3%	74	
6/5/18	28	Prime 4	- 48"	no test hit bedrock					
6/5/18	29	Prime 10	- 6"	102.5	18.0%	76.5	11.9%	75	
6/5/18	30	Prime 10	- 18"	115.0	14.0%	87.3	8.9%	76	
6/5/18	31	Prime 10	- 28"	115.0	14.0%	98.1	7.4%	85	
6/5/18	32	Prime 10	- 48"	no test same material					
6/5/18	33	Prime 5	- 6"	102.5	18.0%	91.5	4.9%	89	
6/5/18	34	Prime 5	- 18"	102.5	18.0%	80.1	13.7%	78	
6/5/18	35	Prime 5	- 28"	115.0	14.0%	93.6	10.5%	81	
6/5/18	36	Prime 5	- 48"	no test same material					
6/5/18	37	Prime 11	- 6"	102.5	18.0%	93.4	9.3%	91	
6/5/18	38	Prime 11	- 18"	115.0	14.0%	84.4	14.8%	73	
6/5/18	39	Prime 11	- 24"	115.0	14.0%	93.2	9.7%	81	
6/5/18	40	Prime 11	- 53"	no test same material					

Gauge:

Density Standard Count:

Moisture Standard Count:

(x) Client's representative was advised of the test results.

GEM Engineering, Inc. **Representative**

Received by: _____ **Technician(s):** Pat Shannon

Representing: _____ **Reviewed by:** _____

Abbreviations: ABC=aggregate base course AC=asphalt concrete BBOF=below bottom of footing BFG=below finish grade BG=below grade BOC=back of curb BOF=bottom of footing BRG=below rough grade BSC=bituminous surface course BSG=below sub grade CL=centerline EL=elevation FG=finished grade FSG=finished sub grade LT=left MH=manhole NSG=native sub grade PC=property corner PL=property line PZ=pipe zone RG=rough grade RT=right SG=sub grade SL=sewer line STA=station WL=water line

Compaction test results reflect the tested fill at the location existing on this date. Test locations and elevations are approximate. No other warranty either expressed or implied is provided.

Field Density Test Summary

GEM ENGINEERING, INC.
485 North Aviation Way ♦ Cedar City, UT 84721
Phone (435) 867-6478 ♦ Fax (435) 867-4372
www.gemengineeringinc.com

Client: Alton Coal

Project #:

Project Name & Location: Alton Coal Mine

Contractor:

Weather:

Equipment used:

Field Density Tests: For: Prime's #13, 14, 15, 16, 17, 19, 20, 21, 22

Test Date	Test No.	Test Location	Elev.	Laboratory Data		Field Data		% Comp	% Req'd
				Lab Max Dry Density	Optimum Moisture	Dry Density	Moisture Content		
8/16/18	1	Prime #13	- 8"	99.0	18.0%	95.4	5.8%	96	
8/16/18	2	Prime #13	- 24"	120.0	11.5%	98.3	14.5%	82	
8/16/18	3	Prime #13	- 36"	109.5	13.5%	99.4	17.0%	91	
8/16/18	4	Prime #13	- 48"	115.5	14.5%	102.8	22.1%	89	
8/16/18	5	Prime #19	12"	99.0	18.0%	71.1	12.1%	72	
8/16/18	6	Prime #19	- 28"	120.0	11.5%	97.1	18.5%	81	
8/16/18	7	Prime #19	- 36"	109.5	13.5%	101.9	14.3%	93	
8/16/18	8	Prime #19	- 48"	115.5	14.5%	102.6	16.7%	89	
8/16/18	9	Prime #14	- 12"	99.0	18.0%	84.7	6.9%	86	
8/16/18	10	Prime #14	- 26"	120.0	11.5%	78.4	16.3%	65	
8/16/18	11	Prime #14	- 36"	109.5	13.5%	96.4	18.7%	88	
8/16/18	12	Prime #14	- 48"	115.5	14.5%	102.1	18.1%	88	
8/16/18	13	Prime #20	- 12"	99.0	18.0%	76.0	11.3%	77	
8/16/18	14	Prime #20	- 24"	120.0	11.5%	86.1	12.9%	72	
8/16/18	15	Prime #20	- 38"	109.5	11.5%	90.4	20.7%	83	
8/16/18	16	Prime #20	- 48"	115.5	14.5%	98.8	20.1%	86	
8/16/18	17	Prime #15	- 16"	99.0	18.0%	68.7	8.7%	69	
8/16/18	18	Prime #15	- 26"	120.0	11.5%	89.7	18.3%	75	
8/16/18	19	Prime #15	- 36"	109.5	13.5%	97.0	19.2%	89	
8/16/18	20	Prime #15	- 48"	115.5	14.5%	103.9	16.6%	90	

Gauge:

Density Standard Count:

Moisture Standard Count:

(x) Client's representative was advised of the test results.

GEM Engineering, Inc. **Representative**

Received by: _____ **Technician(s):** Pat Shannon

Representing: _____ **Reviewed by:** _____

Abbreviations: ABC=aggregate base course AC=asphalt concrete BBOF=below bottom of footing BFG=below finish grade BG=below grade BOC=back of curb BOF=bottom of footing BRG=below rough grade BSC=bituminous surface course BSG=below sub grade CL=centerline EL=elevation FG=finished grade FSG=finished sub grade LT=left MH=manhole NSG=native sub grade PC=property corner PL=property line PZ=pipe zone RG=rough grade RT=right SG=sub grade SL=sewer line STA=station WL=water line

Compaction test results reflect the tested fill at the location existing on this date. Test locations and elevations are approximate. No other warranty either expressed or implied is provided.

Field Density Test Summary

GEM ENGINEERING, INC.
485 North Aviation Way ♦ Cedar City, UT 84721
Phone (435) 867-6478 ♦ Fax (435) 867-4372
www.gemengineeringinc.com

Client: Alton Coal

Project #:

Project Name & Location: Alton Coal Mine

Contractor:

Weather:

Equipment used:

Field Density Tests: For: Prime's #13, 14, 15, 16, 17, 19, 20, 21, 22

Test Date	Test No.	Test Location	Elev.	Laboratory Data		Field Data		% Comp	% Req'd
				Lab Max Dry Density	Optimum Moisture	Dry Density	Moisture Content		
8/16/18	21	Prime #16	- 8"	99.0	18.0%	85.9	13.8%	87	
8/16/18	22	Prime #16	- 24"	120.0	11.5%	85.1	12.6%	71	
8/16/18	23	Prime #16	- 36"	109.5	13.5%	84.3	16.0%	77	
8/16/18	24	Prime #16	- 48"	115.5	14.5%	83.2	17.4%	72	
8/16/18	25	Prime #21	- 8"	99.0	18.0%	82.2	13.6%	83	
8/16/18	26	Prime #21	-24"	120.0	11.5%	104.0	13.9%	87	
8/16/18	27	Prime #21	- 36"	109.5	13.5%	101.4	10.7%	93	
8/16/18	28	Prime #21	- 48"	115.5	14.5%	101.9	12.6%	88	
8/16/18	29	Prime #22	- 8"	99.0	18.0%	82.3	9.6%	83	
8/16/18	30	Prime #22	- 24"	120.0	11.5%	89.7	16.9%	75	
8/16/18	31	Prime #22	- 36"	109.5	13.5%	92.5	10.5%	84	
8/16/18	32	Prime #22	- 48"	115.5	14.5%	100.4	12.4%	87	
8/16/18	33	Prime #17	- 8"	99.0	18.0%	86.9	11.0%	88	
8/16/18	34	Prime #17	- 24"	120.0	11.5%	95.6	9.9%	80	
8/16/18	35	Prime #17	- 36"	109.5	13.5%	94.8	9.8%	87	
8/16/18	36	Prime #17	- 48"	115.5	14.5%	95.1	13.8%	82	

Gauge:

Density Standard Count:

Moisture Standard Count:

(x) Client's representative was advised of the test results.

GEM Engineering, Inc. **Representative**

Received by: _____ **Technician(s):** Pat Shannon

Representing: _____ **Reviewed by:** _____

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