

State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 Phone: (303)894-2100 Fax: (303)894-2109



Table with 4 columns and 1 row for tracking.

RECEIVED FEB - 7 2014 COGCC

SUNDRY NOTICE

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

Form with 11 numbered sections for operator and well information, including contact name, address, API number, and location details.

General Notice

Large form section containing checkboxes for 'CHANGE OF LOCATION', 'CHANGE SPACING UNIT', 'CHANGE OF OPERATOR', 'ABANDONED LOCATION', 'SPUD DATE', 'SUBSEQUENT REPORT OF STAGE', and 'RECLAMATION'.

Technical Engineering/Environmental Notice

Form section with checkboxes for 'Notice of Intent', 'Request to Vent or Flare', 'E&P Waste Disposal', and other technical notices.

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct and complete.

Signed: [Signature] Date: 12/7/12 Email: dcesark@mesa-energy.net Print Name: DAVID CESARK Title: VP- Environmental & Regulatory Affairs

COGCC Approved: [Signature] Title: Oil & Gas Location Assessment Specialist Date: 2-7-14

CONDITIONS OF APPROVAL, IF ANY:

Specialist

TECHNICAL INFORMATION PAGE



FOR OGCC USE ONLY

1. OGCC Operator Number: 10316 API Number: 05-103-11602

2. Name of Operator: Mesa Energy Partners, LLC OGCC Facility ID # 418199

3. Well/Facility Name: BDU Well/Facility Number: 1-2-199

4. Location (QtrQtr, Sec, Twp, Rng, Meridian): NENW Sec1 T1S R99S 6th PM

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5. **DESCRIBE PROPOSED OR COMPLETED OPERATIONS**

Please see attached report and data.

[Faint handwritten notes and signatures at the bottom of the page]

**Mesa Energy Partners, LLC
Buckhorn Draw Unit F01 Pit Closure**

Prepared For:



1001 Seventeenth Street, Suite 1140
Denver, CO 80202

Prepared By:



826 21 ½ Road
Grand Junction, CO 81504
Phone: 970.263.7800
Fax: 970.263.7456

Introduction

This report details the closure of the production pit associated with the Mesa Energy Partners, LLC (Mesa Energy) Buckhorn Draw Unit facility, identified as the F01, and provides an analysis of results and summary of actions taken during the pit closure process. This report also provides the documentation necessary to show that Mesa Energy has conducted an investigation of the pit and surrounding area in accordance with COGCC Pit Closure rules.

Closure activities began on June 28, 2012 and were concluded on November 22, 2012. Information in this report includes: field screening results, laboratory analytical results, soil disposal and complete backfilling of the drill cuttings pit.

Site Location

The site is located in Rio Blanco County, Colorado. The site legal location is Section 1, Township 1 South, Range 99 West of the 6th PM. Please refer to **Figure 1** for the site location.

Evacuation of Pit Contents and Pit Liner Removal and Excavation

The pit was emptied of all drill cuttings using excavation equipment on July 27, 2012. Due to the consistency of the pit contents, the liner was slowly peeled back and used to contain the cuttings during removal. The remainder of the liner was removed once the pit was empty. The cuttings were spread within a bermed containment for drying per COGCC Rule 1003d(2).

The liner from the pit was removed and is currently awaiting waste characterization data for disposal at the Rio Blanco County Landfill in accordance with COGCC Rule 905b(3)A.

Please see the attached **Appendix A** for a photographic log of excavation activities.

Confirmation Sampling Activities

A sample of the contents of the pit was collected by Olsson Associates (Olsson) personnel on June 28, 2012, prior to cuttings removal, and was analyzed according to COGCC Rule 910 and Table 910-1. Please refer to **Table 3** for the results of these samples.

Following excavation of the drill cuttings and removal of the liner, a visual inspection of the pit was conducted by Olsson personnel on July 27, 2012. The pit was surveyed for any visual indications of soil contamination. Those areas which were identified as having staining were screened using the PID. The PID screening indicated low level hydrocarbon impact. Please refer to **Table 1** for the results of the field screening. Please refer to **Figure 2** for a schematic of screening and locations. All of the soil which contained visual staining was then removed using a track hoe.

Ten grab samples were collected on July 27, 2012 from the excavated area to confirm that all contaminated soil had been removed. **Figure 3** shows a schematic of the sampling locations. A sample was taken from each sidewall and the lowest point on either side of the pit. These samples were analyzed for COGCC Rule 910 compliance. Please see **Table 2** for the results of these confirmation samples.

The MESA SS7 and MESA SS8 samples collected for the confirmation exceeded the TPH allowable limits. Additional soil was removed from both of the sidewalls and Olsson returned to the site on 9/20/12 to collect two additional confirmation samples. Please see **Table 2** for the results of these confirmation samples.

The natural soil characteristics of the area were analyzed by collecting five grab samples from undisturbed ground within the vicinity of the pad at a nearby location. **Figure 4** shows the collection locations of the background samples. Four of the samples were collected at a depth of approximately 1 foot below ground surface on September 20, 2012. The other background sample was collected at a depth of approximately 5 feet below ground surface on 10/24/2012. All background samples were analyzed for arsenic only. Please refer to **Table 4** for the results of this sampling.

Each sample was collected in laboratory supplied sample containers, labeled, logged on the chain-of-custody form and packed on ice for preservation.

All samples were submitted, via overnight delivery and under strict chain-of-custody protocol, to Accutest Laboratories of Wheat Ridge, CO for analysis. All samples arrived in good condition, and within the appropriate temperature range and holding time.

The laboratory data reports, including the chain-of-custody forms, for the samples collected during the activities described above are attached to this report in Appendix B.

Management of Stockpiled Material

The pit liner was separated from the contents of the pit and stored on site. The pit contents were sampled on 6/28/2012 to determine the level of COGCC Table 910-1 constituents. All drill cuttings and excavated soil were mixed and stored on site. One grab sample was collected by Olsson on September 20, 2012 from this mixture and analyzed for Total Petroleum Hydrocarbons and BTEX. The results of this sample indicated TPH was reported over the allowable limits in Table 910-1. The cuttings/soil mixture was mixed further with native soil. Three grab samples were collected on October 8, 2012 and analyzed for the same constituents as the earlier samples. Please refer to **Table 3** for the results of these samples.

The laboratory analysis of the final grab samples indicated that the soil pile meets Table 910-1 standards, with the exception of pH and arsenic.

Backfilling Activities

Interim reclamation and backfilling operations were completed on November 22, 2012. The results from the stock pile material samples show that the cuttings/soils were mixed to acceptable levels, within Table 910-1 standards except pH and SAR. However, these

exceedances are not expected to present an issue for revegetation success, as these soils are buried below three feet of native soil.

TABLES

Analytical Summary

Table 1
Buckhorn Draw Unit F11
Field Screening Summary
Mesa Energy Partners LLC

FIELD SCREENING SUMMARY (ppm)	
SCREEN 1	380.5
SCREEN 2	112.9
SCREEN 3	0.1
SCREEN 4	0.1
SCREEN 5	0.1
SCREEN 6	0.6
SCREEN 7	0.0
SCREEN 8	87.9

ppm - parts per million

Table 2
Buckhorn Draw Unit F01
Confirmation Soil Sample Summary
Mesa Energy Partners LLC

LABORATORY DATA SUMMARY															ALLOWABLE LIMITS	UNITS
Sample ID	MESA SS1	MESA SS2	MESA SS3	MESA SS4	MESA SS5	MESA SS6	MESA SS7	MESA SS8	F01 SS2	MESA SS9	MESA SS10					
Sample Date	7/27/2012	7/27/2012	7/27/2012	7/27/2012	7/27/2012	7/27/2012	7/27/2012	7/27/2012	9/20/2012	7/27/2012	9/20/2012	7/27/2012	7/27/2012			
Sample Description	Confirmation	MESA SS7 Resample	Confirmation	MESA SS8 Resample	Confirmation	Confirmation										
Analytical Parameters																
TPH																
TPH-GRO	U	U	U	U	U	U	U	U	9.05	42.2	7.2	U	U	NA	mg/kg	
TPH-DRO	U	23.6	U	U	58.7	U	625	411	608	432	72.0	16.9	NA	mg/kg		
Total TPH	U	23.6	U	U	58.7	U	625	420.1	650.2	439.2	72.0	16.9	500	mg/kg		
BTEX																
Benzene	U	U	U	U	U	U	U	U	0.0844	U	U	U	U	0.17	mg/kg	
Toluene	U	U	U	U	U	U	U	U	0.479	0.0852	0.192	U	U	85	mg/kg	
Ethylbenzene	U	U	U	U	U	U	U	U	0.0792	0.0452	0.0367	U	U	100	mg/kg	
Total Xylene	U	U	U	U	U	U	U	U	0.738	0.5	0.303	0.154	U	175	mg/kg	
Metals																
Chromium, Hexavalent	U	U	U	U	U	U	U	U	NT	U	NT	U	U	23	mg/kg	
Chromium, Trivalent	32.7	34.5	35.9	36.5	31.2	35.6	43.6	NT	48.9	NT	37.1	35.2	120,000	mg/kg		
Arsenic	5.3	4.8	6.6	6.6	3.5	6.4	6.1	NT	7.5	NT	7.0	6.2	0.39	mg/kg		
Barium	223	370	196	199	219	170	254	NT	474	NT	694	325	15,000	mg/kg		
Boron	U	U	U	U	U	U	U	U	U	NT	U	U	2	mg/kg		
Cadmium	U	U	U	U	U	U	U	U	U	NT	U	U	70	mg/kg		
Chromium	33.2	35	35.9	36.5	31.2	35.6	43.6	NT	48.9	NT	37.1	35.2	NA	mg/kg		
Copper	11.4	10.1	10.1	8.7	15.5	10.9	10.4	NT	13.3	NT	12.2	10.4	3100	mg/kg		
Lead	10.7	10.3	10.8	9.9	11.6	9.8	10.1	NT	10.6	NT	10.2	10.1	400	mg/kg		
Mercury	U	U	U	U	U	U	U	U	0.21	NT	U	U	23	mg/kg		
Nickel	15	14.6	15.1	15.6	14.2	14.8	15.6	NT	17.6	NT	15	15.1	1,600	mg/kg		
Selenium	U	U	U	U	U	U	U	U	U	NT	U	U	390	mg/kg		
Silver	U	U	U	U	U	U	U	U	U	NT	U	U	390	mg/kg		
Zinc	43.9	46.4	43.4	44.3	45.3	42.0	47.8	NT	53.9	NT	44.9	45.5	23,000	mg/kg		
Polynuclear Aromatic Hydrocarbons																
Anthracene	U	U	U	U	U	U	U	U	NT	U	NT	U	U	1,000	mg/kg	
Acenaphthene	U	U	U	U	U	U	U	U	NT	U	NT	U	U	1,000	mg/kg	
Benzo(a)anthracene	U	U	U	U	U	U	U	U	U	NT	U	U	0.22	mg/kg		
Benzo(a)pyrene	U	U	U	U	U	U	U	U	NT	U	NT	U	U	0.022	mg/kg	
Benzo(b)fluoranthene	U	U	U	U	U	U	U	U	NT	U	NT	U	U	0.22	mg/kg	
Benzo(k)fluoranthene	U	U	U	U	U	U	U	U	NT	U	NT	U	U	2.2	mg/kg	
Chrysene	U	U	U	U	U	U	0.0103	NT	0.0555	NT	U	U	22	mg/kg		
Dibenz(a,h)anthracene	U	U	U	U	U	U	U	U	U	NT	U	U	0.022	mg/kg		
Fluoranthene	U	U	U	U	U	U	U	U	NT	U	NT	U	U	1,000	mg/kg	
Fluorene	U	U	U	U	U	U	U	U	NT	0.663	NT	U	U	1,000	mg/kg	
Indeno(1,2,3-cd)pyrene	U	U	U	U	U	U	U	U	U	NT	U	U	0.22	mg/kg		
Naphthalene	U	U	U	U	0.0192	U	0.0355	NT	0.777	NT	34.0	0.0226	23	mg/kg		
Pyrene	U	U	U	U	U	U	0.0147	NT	0.0358	NT	U	U	1,000	mg/kg		
General Chemistry																
pH	9.95	10.04	9.81	9.78	9.80	9.69	9.91	NT	9.71	NT	10.03	9.80	6-9	SU		
Redox Potential Vs H2	305	306	314	314	310	320	311	NT	299	NT	288	296	NA	mv		
Sodium Adsorption Ratio	21.2	16.5	15.5	14.2	9.74	5.44	16.4	NT	15.1	NT	7.11	9.11	<12	RATIO		
Solids, Percent	83.5	81	79.6	83	80.7	87.6	81.9	NT	77.5	NT	84.4	82.7	NA	%		
Specific Conductivity	2.23	0.765	1.9	1.57	0.792	0.847	1.45	NT	1.15	NT	0.877	0.774	<4 or 2 times the background	mmhos/cm		

mg/kg - milligrams per kilogram
BDL - parameter was below the detection limit
umhos/cm - microhmhos per centimeter
su - standard units
mv - millivolts

Table 3
Buckhorn Draw Unit F01
Drill Cuttings Sample Summary
Mesa Energy Partners LLC

LABORATORY DATA SUMMARY							
Sample ID	SS1 F01	F01 SS3	MESA F01 CUT1	MESA F01 CUT2	MESA F01 CUT3	ALLOWABLE LIMITS	UNITS
Sample Date	6/28/2012	9/20/2012	10/8/2012	10/8/2012	10/8/2012		
Sample Description	Grab- Drill Cuttings						
Analytical Parameters							
TPH							
TPH-GRO	15.0	U	6.19	U	U	NA	mg/kg
TPH-DRO	184	567	275	422	169	NA	mg/kg
Total TPH	199	567	281.19	422	169	500	mg/kg
BTEX							
Benzene	0.0375	U	0.0466	0.0347	0.0351	0.17	mg/kg
Toluene	0.200	0.074	0.329	0.194	0.184	85	mg/kg
Ethylbenzene	0.0524	U	0.0574	0.0380	0.0340	100	mg/kg
Total Xylene	0.434	0.155	0.693	0.376	0.357	175	mg/kg
Metals							
Chromium, Hexavalent	NT	NT	U	U	U	23	mg/kg
Chromium, Trivalent	NT	NT	29.9	30.1	31.4	120,000	mg/kg
Arsenic	9.9	NT	8.0	7.1	9.0	0.39	mg/kg
Barium	NT	NT	1590	1430	1530	15,000	mg/kg
Cadmium	NT	NT	U	U	U	70	mg/kg
Chromium	NT	NT	29.9	30.1	31.4	NA	mg/kg
Copper	NT	NT	13.4	13.6	13.0	3100	mg/kg
Lead	NT	NT	9.1	10.6	9.7	400	mg/kg
Mercury	NT	NT	0.12	0.18	U	23	mg/kg
Nickel	NT	NT	12.9	13.4	14.2	1,600	mg/kg
Selenium	NT	NT	U	U	U	390	mg/kg
Silver	NT	NT	U	U	U	390	mg/kg
Zinc	NT	NT	65.1	58.6	58.4	23000	mg/kg
Polynuclear Aromatic Hydrocarbons							
Anthracene	NT	NT	U	U	U	1,000	mg/kg
Acenaphthene	NT	NT	U	U	U	1,000	mg/kg
Benzo(a)anthracene	NT	NT	U	U	U	0.22	mg/kg
Benzo(a)pyrene	NT	NT	U	U	U	0.022	mg/kg
Benzo(b)fluoranthene	NT	NT	U	U	U	0.22	mg/kg
Benzo(k)fluoranthene	NT	NT	U	U	U	2.2	mg/kg
Chrysene	NT	NT	0.0345	0.0267	0.0267	22	mg/kg
Dibenzo(a,h)anthracene	NT	NT	U	U	U	0.022	mg/kg
Fluoranthene	NT	NT	0.0141	0.0121	0.0101	1,000	mg/kg
Fluorene	NT	NT	U	U	0.0344	1,000	mg/kg
Indeno(1,2,3-cd)pyrene	NT	NT	U	U	U	0.22	mg/kg
Napthalene	NT	NT	0.143	0.110	0.122	23	mg/kg
Pyrene	NT	NT	0.0208	0.0187	0.0181	1,000	mg/kg
General Chemistry							
pH	9.88	NT	9.58	9.60	9.54	6-9	SU
Redox Potential Vs H2	NT	NT	225	222	19.9	NA	mv
Sodium Adsorption Ratio	11.0	NT	11.7	11.9	11.8	<12	RATIO
Solids, Percent	90.3	NT	92	91.9	91.8	NA	%
Specific Conductivity	NT	NT	2.160	2.400	2.790	<4 or 2 times the background	mmhos/cm

mg/kg - milligrams per kilogram
BDL - parameter was below the detection limit
umhos/cm - micromhos per centimeter
su - standard units
mv - millivolts
NA - not applicable

Indicates a result which is over the allowable limit and but below background levels

Indicates a result which is over the allowable limit and background levels

Indicates a result which is over the allowable limit

Table 4
Buckhorn Draw Unit F01
Background Sample Summary
Mesa Energy Partners LLC

LABORATORY DATA SUMMARY						
Sample ID	F11 BG1	F11 BG2	F11 BG3	F11 BG4	F11 BG5	UNITS
Sample Date	9/20/2012	9/20/2012	9/20/2012	9/20/2012	10/24/2012	
Sample Depth	0-12"	0-12"	0-12"	0-12"	5'	
GPS N	39.98224	39.98228	39.98177	39.9819	39.98141	
GPS W	-108.47653	-108.4771	-108.47517	-108.9749	-108.47559	
Analytical Parameters						
Metals						
Arsenic	6.3	6.6	5.9	6.4	9.4	mg/kg

mg/kg - milligrams per kilogram

FIGURES

Sample Location Maps



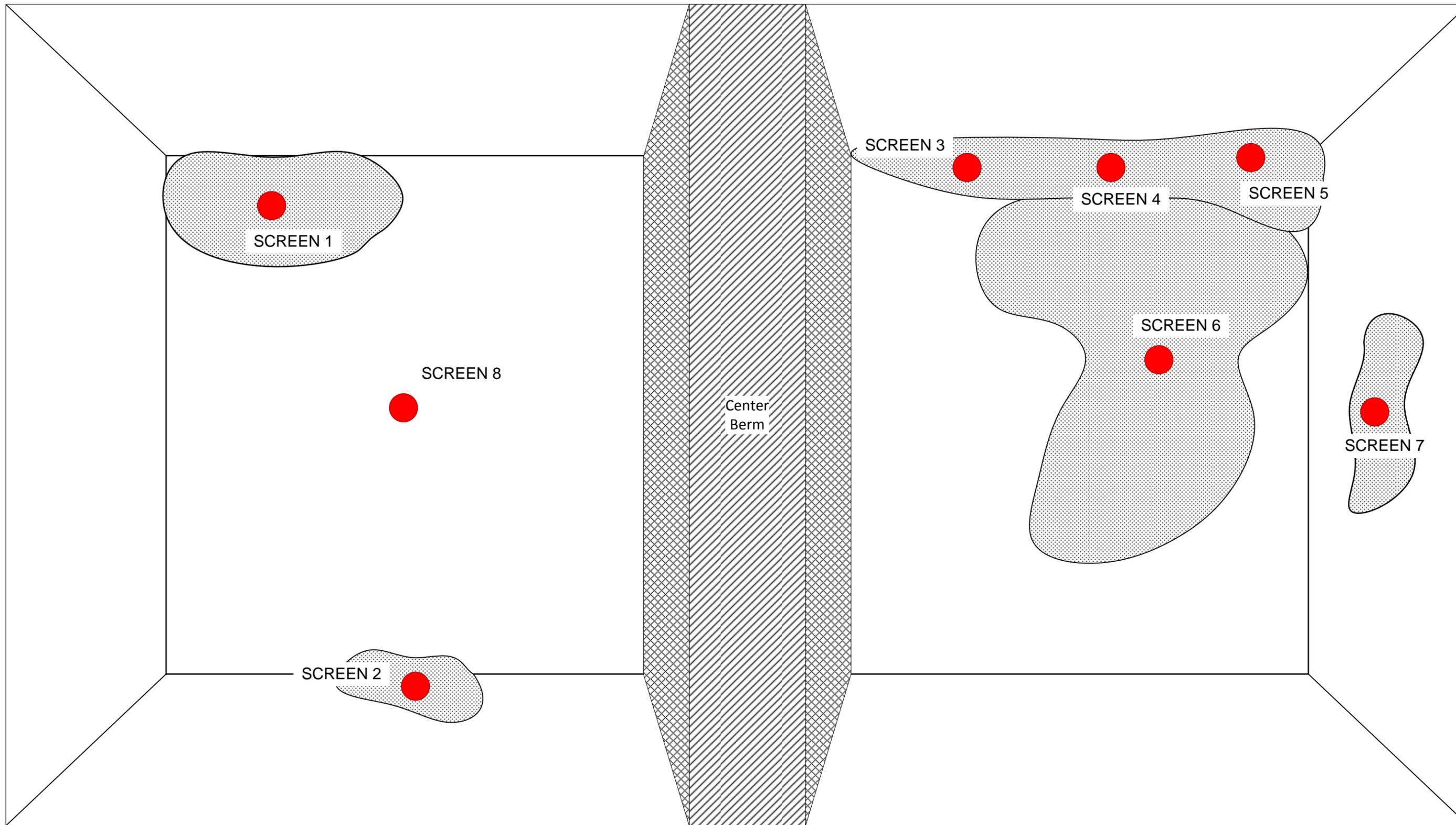
PROJECT NO: 012-1436
 DRAWN BY: JLS
 DATE: 10/10/12

Buckhorn Draw Unit F01 Site Location
Mesa Energy Partners, LLC
 SECTION 1, TOWNSHIP 1S, RANGE 99W, 6th PM
 RIO BLANCO COUNTY, CO



826 21½ Road
 Grand Junction, CO 81505
 TEL 970.263.7800
 FAX 970.263.7456

Figure
 1



PROJECT NO:	012-1436
DRAWN BY:	JLS
DATE:	10/10/12

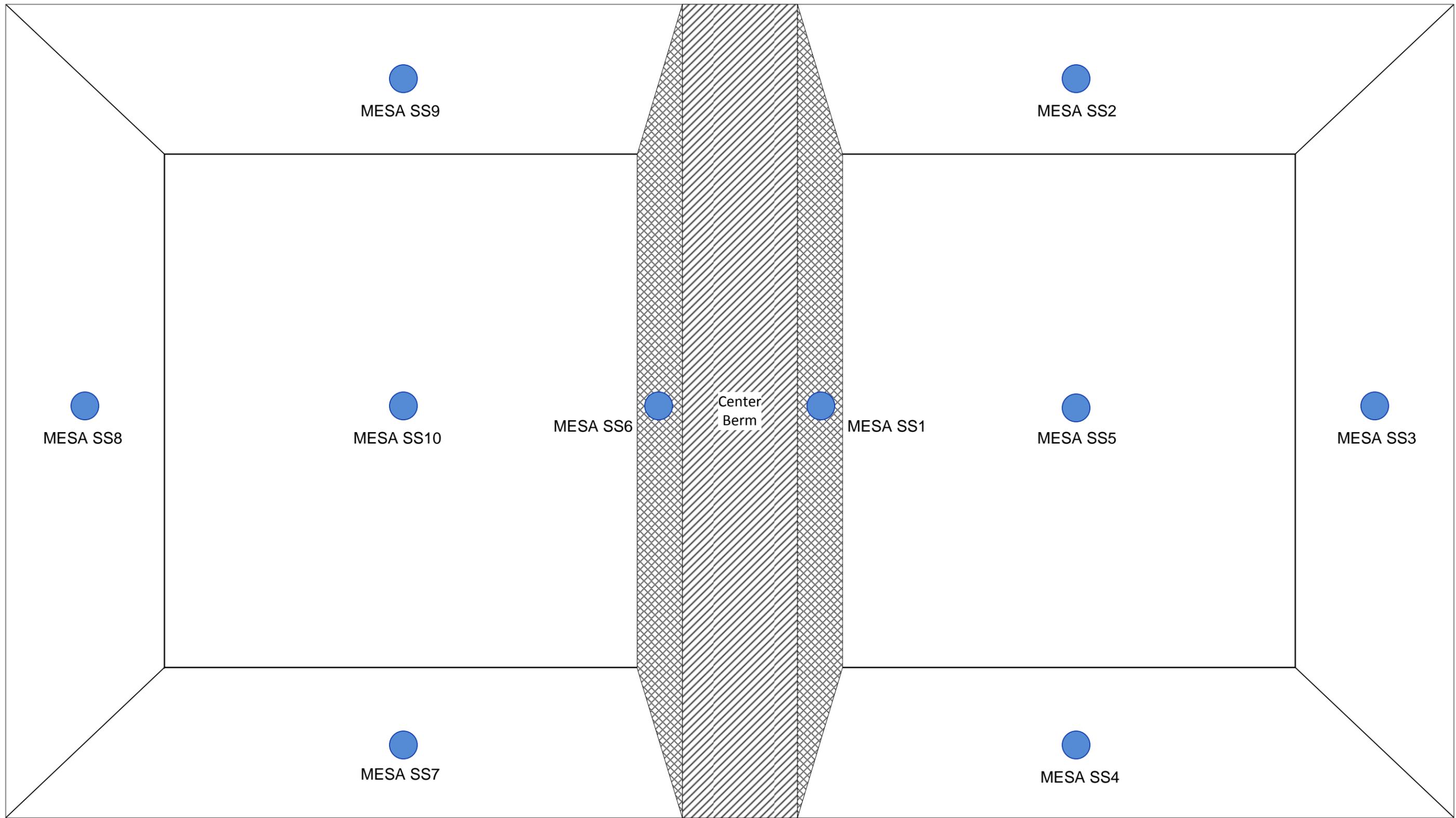
Buckhorn Draw Unit F01
Field Screening Schematic
 Mesa Energy Partners, LLC



826 21½ Road
 Grand Junction, CO 81505
 TEL 970.263.7800
 FAX 970.263.7456

FIGURE

2



PROJECT NO:	012-1436
DRAWN BY:	JLS
DATE:	8/16/2012

Buckhorn Draw Unit F01
Confirmation Sampling Schematic
 Mesa Energy Partners, LLC



826 21½ Road
 Grand Junction, CO 81505
 TEL 970.263.7800
 FAX 970.263.7456

FIGURE

3

LEGEND

● Background Sampling Location



PROJECT NO:	012-1436
DRAWN BY:	JLS
DATE:	10/11/12

**Buckhorn Draw Unit F01
Background Sampling Schematic**
Mesa Energy Partners, LLC



826 21½ Road
Grand Junction, CO 81505
TEL 970.263.7800
FAX 970.263.7456

FIGURE

4

APPENDIX A

Photographic Log

PHOTOGRAPHIC LOG
Buckhorn Draw Unit F01 Pit Closure
Mesa Energy Partners, LLC



Photo 1 – View of the northern end of the pit after removal of the liner. Photo is taken from the northeast corner looking southwest. Photo taken on 7/27/12.



Photo 2 – View of the southern end of the pit after removal of the liner. Photo is taken from the northwest corner looking southeast. Photo taken on 7/27/12.



Photo 3 – View of pit contents after removal. Photo taken on 7/27/12.



Photo 4 – View of the northern end of the pit after removal of the contaminated soil. Photo is taken from the bottom of the pit looking south. Photo taken on 7/27/12.



Photo 5 – View of the southern end of the pit after removal of the contaminated soil. Photo is taken from the northwest corner looking southeast. Photo taken on 7/27/12.

APPENDIX B

Laboratory Analytical Results

Technical Report for

Olsson Associates

Mesa Energy F01 Pit Sampling

PO #012-1436

Accutest Job Number: D36034

Sampling Date: 06/28/12

Report to:

Olsson Associates

jsutrina@oaconsulting.com

ATTN: Jessica Sutrina

Total number of pages in report: 17



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.



Brad Madadian
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.

Test results relate only to samples analyzed.

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1

2

3

4

5



Sample Summary

Olsson Associates

Job No: D36034

Mesa Energy F01 Pit Sampling
Project No: PO #012-1436

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D36034-1	06/28/12	16:50 SG	06/30/12	SO	Soil	SS1 F01
D36034-1A	06/28/12	16:50 SG	06/30/12	SO	Soil	SS1 F01

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D36034

Site: Mesa Energy F01 Pit Sampling

Report Date 7/17/2012 8:07:25 AM

On 06/30/2012, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.8 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D36034 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix SO	Batch ID: V3V1104
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36036-6MS, D36036-6MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB915
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D35919-1MS, D35919-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP6163
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36006-1MS, D36006-1MSD were used as the QC samples indicated.

Metals By Method SW846 6010C

Matrix AQ	Batch ID: MP7836
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC11920-12MS, MC11920-12MSD, MC11920-12SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Sodium are outside control limits for sample MP7836-SD1. Probable cause due to sample homogeneity.
- MP7836-SD1 for Sodium: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020A

Matrix SO	Batch ID: MP7870
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36215-1MS, D36215-1MSD, D36215-1SDL were used as the QC samples for the metals analysis.

Wet Chemistry By Method SM19 2540B M

Matrix SO	Batch ID: GN15670
------------------	--------------------------

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 9045D

Matrix SO	Batch ID: GN15665
------------------	--------------------------

- The following samples were run outside of holding time for method SW846 9045D: D36034-1

Wet Chemistry By Method USDA HANDBOOK 60

Matrix SO	Batch ID: MP7836
------------------	-------------------------

- D36034-1A for Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D36034
Account: Olsson Associates
Project: Mesa Energy F01 Pit Sampling
Collected: 06/28/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

D36034-1 SS1 F01

Benzene		37.5 J	60	23	ug/kg	SW846 8260B
Toluene		200	120	60	ug/kg	SW846 8260B
Ethylbenzene		52.4 J	120	23	ug/kg	SW846 8260B
Xylene (total)		434	240	120	ug/kg	SW846 8260B
TPH-GRO (C6-C10)		15.0	12	6.0	mg/kg	SW846 8015B
TPH-DRO (C10-C28)		184	15	9.6	mg/kg	SW846-8015B
Arsenic		9.9	0.10		mg/kg	SW846 6020A
pH		9.88			su	SW846 9045D

D36034-1A SS1 F01

Calcium		7.35	2.0		mg/l	SW846 6010C
Sodium		118	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio ^a		11.0			ratio	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \text{sqrt} [(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]$

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: SS1 F01		Date Sampled: 06/28/12
Lab Sample ID: D36034-1		Date Received: 06/30/12
Matrix: SO - Soil		Percent Solids: 90.3
Method: SW846 8260B		
Project: Mesa Energy F01 Pit Sampling		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V19025.D	1	07/03/12	BD	n/a	n/a	V3V1104
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.07 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	37.5	60	23	ug/kg	J
108-88-3	Toluene	200	120	60	ug/kg	
100-41-4	Ethylbenzene	52.4	120	23	ug/kg	J
1330-20-7	Xylene (total)	434	240	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	94%		61-130%
460-00-4	4-Bromofluorobenzene	106%		53-131%
17060-07-0	1,2-Dichloroethane-D4	99%		62-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SS1 F01	Date Sampled: 06/28/12
Lab Sample ID: D36034-1	Date Received: 06/30/12
Matrix: SO - Soil	Percent Solids: 90.3
Method: SW846 8015B	
Project: Mesa Energy F01 Pit Sampling	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16512.D	1	07/03/12	SK	n/a	n/a	GGB915
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	15.0	12	6.0	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	94%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: SS1 F01	Date Sampled: 06/28/12
Lab Sample ID: D36034-1	Date Received: 06/30/12
Matrix: SO - Soil	Percent Solids: 90.3
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F01 Pit Sampling	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD15120.D	1	07/06/12	AW	07/02/12	OP6163	GFD783
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	184	15	9.6	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	77%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: SS1 F01	Date Sampled: 06/28/12
Lab Sample ID: D36034-1	Date Received: 06/30/12
Matrix: SO - Soil	Percent Solids: 90.3
Project: Mesa Energy F01 Pit Sampling	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.9	0.10	mg/kg	5	07/11/12	07/17/12 JM	SW846 6020A ¹	SW846 3050B ²

(1) Instrument QC Batch: MA2615

(2) Prep QC Batch: MP7870

RL = Reporting Limit

4.1
4

Report of Analysis

Client Sample ID: SS1 F01	Date Sampled: 06/28/12
Lab Sample ID: D36034-1	Date Received: 06/30/12
Matrix: SO - Soil	Percent Solids: 90.3
Project: Mesa Energy F01 Pit Sampling	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	90.3		%	1	07/03/12	SWT	SM19 2540B M
pH	9.88		su	1	07/02/12 15:10	CT	SW846 9045D

RL = Reporting Limit

4.1
 4

Report of Analysis

Client Sample ID: SS1 F01	Date Sampled: 06/28/12
Lab Sample ID: D36034-1A	Date Received: 06/30/12
Matrix: SO - Soil	Percent Solids: 90.3
Project: Mesa Energy F01 Pit Sampling	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	7.35	2.0	mg/l	1	07/06/12 07/09/12 JM	SW846 6010C ¹	EPA 200.7 ²	
Magnesium	< 1.0	1.0	mg/l	1	07/06/12 07/09/12 JM	SW846 6010C ¹	EPA 200.7 ²	
Sodium	118	2.0	mg/l	1	07/06/12 07/09/12 JM	SW846 6010C ¹	EPA 200.7 ²	

(1) Instrument QC Batch: MA2587

(2) Prep QC Batch: MP7836

RL = Reporting Limit

4.2
4

Report of Analysis

Client Sample ID: SS1 F01	Date Sampled: 06/28/12
Lab Sample ID: D36034-1A	Date Received: 06/30/12
Matrix: SO - Soil	Percent Solids: 90.3
Project: Mesa Energy F01 Pit Sampling	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	11.0		ratio	1	07/09/12 23:46	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

4.2
 4

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D36034

Client: OLSSON ASSOC.

Immediate Client Services Action Required: No

Date / Time Received: 6/30/2012 9:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: MESA ENERGY F01 PIT SAMPLING

Airbill #'s: FedEx

<u>Cooler Security</u>	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www.accutest.com

5.1
5

Technical Report for

Olsson Associates

Mesa Energy F-01 Pit Closure

Accutest Job Number: D36852

Sampling Date: 07/27/12

Report to:

Olsson Associates

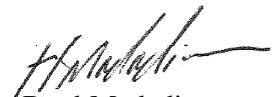
jsutrina@oaconsulting.com

ATTN: Jessica Sutrina

Total number of pages in report: **98**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.



Brad Madadian
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

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Test results relate only to samples analyzed.

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Sample Summary

Olsson Associates

Job No: D36852

Mesa Energy F-01 Pit Closure

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D36852-1	07/27/12	12:50 JS	07/28/12	SO	Soil	MESA SS1
D36852-1A	07/27/12	12:50 JS	07/28/12	SO	Soil	MESA SS1
D36852-2	07/27/12	12:55 JS	07/28/12	SO	Soil	MESA SS2
D36852-2A	07/27/12	12:55 JS	07/28/12	SO	Soil	MESA SS2
D36852-3	07/27/12	13:00 JS	07/28/12	SO	Soil	MESA SS3
D36852-3A	07/27/12	13:00 JS	07/28/12	SO	Soil	MESA SS3
D36852-4	07/27/12	13:05 JS	07/28/12	SO	Soil	MESA SS4
D36852-4A	07/27/12	13:05 JS	07/28/12	SO	Soil	MESA SS4
D36852-5	07/27/12	13:10 JS	07/28/12	SO	Soil	MESA SS5
D36852-5A	07/27/12	13:10 JS	07/28/12	SO	Soil	MESA SS5
D36852-6	07/27/12	14:30 JS	07/28/12	SO	Soil	MESA SS6
D36852-6A	07/27/12	14:30 JS	07/28/12	SO	Soil	MESA SS6
D36852-7	07/27/12	14:35 JS	07/28/12	SO	Soil	MESA SS7

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary

(continued)

Olsson Associates

Job No: D36852

Mesa Energy F-01 Pit Closure

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D36852-7A	07/27/12	14:35 JS	07/28/12	SO	Soil	MESA SS7
D36852-8	07/27/12	14:40 JS	07/28/12	SO	Soil	MESA SS8
D36852-8A	07/27/12	14:40 JS	07/28/12	SO	Soil	MESA SS8
D36852-9	07/27/12	14:45 JS	07/28/12	SO	Soil	MESA SS9
D36852-9A	07/27/12	14:45 JS	07/28/12	SO	Soil	MESA SS9
D36852-10	07/27/12	14:50 JS	07/28/12	SO	Soil	MESA SS10
D36852-10A	07/27/12	14:50 JS	07/28/12	SO	Soil	MESA SS10

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D36852

Site: Mesa Energy F-01 Pit Closure

Report Date 8/10/2012 3:17:06 PM

On 07/28/2012, 10 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.2 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D36852 was assigned to the project. The lab sample IDs, client sample IDs, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix SO	Batch ID: V5V1397
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D36861-1MS, D36861-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix SO	Batch ID: OP6341
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D36861-1MS, D36861-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery(s) of Dibenzo(a,h)anthracene are outside control limits. Outside control limits due to possible matrix interference.
- The matrix spike duplicate (MSD) recovery(s) of Dibenzo(a,h)anthracene are outside control limits. Probable cause due to matrix interference.
- D36852-8: Dilution required due to matrix interference; extract was viscous.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB933
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D36849-1MS, D36849-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP6355
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D36910-1MS, D36910-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO	Batch ID: OP6366
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D36852-10MS, D36852-10MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010C

Matrix AQ	Batch ID: MP8058
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36860-1AMS, D36860-1AMSD, D36860-1ASDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Magnesium, Sodium are outside control limits for sample MP8058-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP8058-SD1 for Sodium: Serial dilution indicates possible matrix interference.

Matrix SO	Batch ID: MP8022
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36834-1SDL, D36834-1MS, D36834-1MSD, D36834-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Barium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- The RPD(s) for the MS and MSD recoveries of Barium are outside control limits for sample MP8022-S2. High RPD due to possible sample matrix or nonhomogeneity.
- The serial dilution RPD(s) for Boron, Selenium, Silver, Barium, Nickel, Zinc are outside control limits for sample MP8022-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP8022-SD1 for Barium, Nickel, and Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020A

Matrix SO	Batch ID: MP8023
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36834-1MS, D36834-1MSD, D36834-1SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471B

Matrix SO	Batch ID: MP8019
------------------	-------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36747-1MS, D36747-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method ASTM D1498-76M

Matrix SO	Batch ID: GN16065
------------------	--------------------------

- Sample(s) D36853-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

Wet Chemistry By Method SM19 2540B M

Matrix SO	Batch ID: GN16080
------------------	--------------------------

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO **Batch ID:** R13803

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13804

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-2 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13805

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-3 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13806

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-4 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13807

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-5 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13808

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-6 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13809

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-7 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13810

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-8 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13811

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-9 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO **Batch ID:** R13812

- The data for SW846 3060/7196A M meets quality control requirements.
- D36852-10 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO **Batch ID:** GP7844

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D36977-1DUP, D36977-1MS, D36977-1MSD were used as the QC samples for the Chromium, Hexavalent analysis.

Wet Chemistry By Method SW846 9045D

Matrix SO	Batch ID: GN16062
------------------	--------------------------

- The following samples were run outside of holding time for method SW846 9045D: D36852-1, D36852-10, D36852-3, D36852-4, D36852-5, D36852-6, D36852-7, D36852-8

Matrix SO	Batch ID: GN16064
------------------	--------------------------

- The following samples were run outside of holding time for method SW846 9045D: D36852-2, D36852-9

Wet Chemistry By Method USDA HANDBOOK 60

Matrix SO	Batch ID: MP8058
------------------	-------------------------

- All samples for Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D36852
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 07/27/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

D36852-1 MESA SS1

Arsenic	5.3	0.12			mg/kg	SW846 6020A
Barium	223	1.2			mg/kg	SW846 6010C
Chromium	33.2	1.2			mg/kg	SW846 6010C
Copper	11.4	1.2			mg/kg	SW846 6010C
Lead	10.7	5.9			mg/kg	SW846 6010C
Nickel	15.0	3.6			mg/kg	SW846 6010C
Zinc	43.9	3.6			mg/kg	SW846 6010C
Chromium, Trivalent ^a	32.7	2.2			mg/kg	SW846 3060/7196A M
Redox Potential Vs H2	305				mv	ASTM D1498-76M
Specific Conductivity	2230	1.0			umhos/cm	DEPT.OF AG, BOOK N9
pH	9.95				su	SW846 9045D

D36852-1A MESA SS1

Calcium	8.23	2.0			mg/l	SW846 6010C
Magnesium	2.82	1.0			mg/l	SW846 6010C
Sodium	277	2.0			mg/l	SW846 6010C
Sodium Adsorption Ratio ^b	21.2				ratio	USDA HANDBOOK 60

D36852-2 MESA SS2

TPH-DRO (C10-C28)	23.6	16	11		mg/kg	SW846-8015B
Arsenic	4.8	0.12			mg/kg	SW846 6020A
Barium	370	1.2			mg/kg	SW846 6010C
Chromium	35.0	1.2			mg/kg	SW846 6010C
Copper	10.1	1.2			mg/kg	SW846 6010C
Lead	10.3	6.2			mg/kg	SW846 6010C
Nickel	14.6	3.7			mg/kg	SW846 6010C
Zinc	46.4	3.7			mg/kg	SW846 6010C
Chromium, Trivalent ^a	34.5	2.2			mg/kg	SW846 3060/7196A M
Redox Potential Vs H2	306				mv	ASTM D1498-76M
Specific Conductivity	765	1.0			umhos/cm	DEPT.OF AG, BOOK N9
pH	10.04				su	SW846 9045D

D36852-2A MESA SS2

Calcium	3.89	2.0			mg/l	SW846 6010C
Magnesium	1.93	1.0			mg/l	SW846 6010C
Sodium	159	2.0			mg/l	SW846 6010C
Sodium Adsorption Ratio ^b	16.5				ratio	USDA HANDBOOK 60

Summary of Hits

Job Number: D36852
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 07/27/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method	
D36852-3	MESA SS3						
		Arsenic	6.6	0.12	mg/kg	SW846 6020A	
		Barium	196	1.2	mg/kg	SW846 6010C	
		Chromium	35.9	1.2	mg/kg	SW846 6010C	
		Copper	10.1	1.2	mg/kg	SW846 6010C	
		Lead	10.8	6.2	mg/kg	SW846 6010C	
		Nickel	15.1	3.7	mg/kg	SW846 6010C	
		Zinc	43.4	3.7	mg/kg	SW846 6010C	
		Chromium, Trivalent ^a	35.9	2.2	mg/kg	SW846 3060/7196A M	
		Redox Potential Vs H2	314		mv	ASTM D1498-76M	
		Specific Conductivity	1900	1.0	umhos/cm	DEPT.OF AG, BOOK N9	
		pH	9.81		su	SW846 9045D	
D36852-3A	MESA SS3						
		Calcium	17.4	2.0	mg/l	SW846 6010C	
		Magnesium	10.1	1.0	mg/l	SW846 6010C	
		Sodium	328	2.0	mg/l	SW846 6010C	
		Sodium Adsorption Ratio ^b	15.5		ratio	USDA HANDBOOK 60	
D36852-4	MESA SS4						
		Arsenic	6.6	0.12	mg/kg	SW846 6020A	
		Barium	199	1.2	mg/kg	SW846 6010C	
		Chromium	36.5	1.2	mg/kg	SW846 6010C	
		Copper	8.7	1.2	mg/kg	SW846 6010C	
		Lead	9.9	6.1	mg/kg	SW846 6010C	
		Nickel	15.6	3.7	mg/kg	SW846 6010C	
		Zinc	44.3	3.7	mg/kg	SW846 6010C	
		Chromium, Trivalent ^a	36.5	2.2	mg/kg	SW846 3060/7196A M	
		Redox Potential Vs H2	314		mv	ASTM D1498-76M	
		Specific Conductivity	1570	1.0	umhos/cm	DEPT.OF AG, BOOK N9	
		pH	9.78		su	SW846 9045D	
D36852-4A	MESA SS4						
		Calcium	18.6	2.0	mg/l	SW846 6010C	
		Magnesium	6.76	1.0	mg/l	SW846 6010C	
		Sodium	281	2.0	mg/l	SW846 6010C	
		Sodium Adsorption Ratio ^b	14.2		ratio	USDA HANDBOOK 60	
D36852-5	MESA SS5						
		Naphthalene	19.2	14	13	ug/kg	SW846 8270C BY SIM

Summary of Hits

Job Number: D36852
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 07/27/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TPH-DRO (C10-C28)		58.7	17	11	mg/kg	SW846-8015B
Arsenic		3.5	0.12		mg/kg	SW846 6020A
Barium		219	1.2		mg/kg	SW846 6010C
Chromium		31.2	1.2		mg/kg	SW846 6010C
Copper		15.5	1.2		mg/kg	SW846 6010C
Lead		11.6	6.0		mg/kg	SW846 6010C
Nickel		14.2	3.6		mg/kg	SW846 6010C
Zinc		45.3	3.6		mg/kg	SW846 6010C
Chromium, Trivalent ^a		31.2	2.2		mg/kg	SW846 3060/7196A M
Redox Potential Vs H2		310			mv	ASTM D1498-76M
Specific Conductivity		792	1.0		umhos/cm	DEPT.OF AG, BOOK N9
pH		9.80			su	SW846 9045D
D36852-5A MESA SS5						
Calcium		8.28	2.0		mg/l	SW846 6010C
Magnesium		4.07	1.0		mg/l	SW846 6010C
Sodium		137	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio ^b		9.74			ratio	USDA HANDBOOK 60
D36852-6 MESA SS6						
Arsenic		6.4	0.12		mg/kg	SW846 6020A
Barium		170	1.2		mg/kg	SW846 6010C
Chromium		35.6	1.2		mg/kg	SW846 6010C
Copper		10.9	1.2		mg/kg	SW846 6010C
Lead		9.8	5.8		mg/kg	SW846 6010C
Nickel		14.8	3.5		mg/kg	SW846 6010C
Zinc		42.0	3.5		mg/kg	SW846 6010C
Chromium, Trivalent ^a		35.6	2.2		mg/kg	SW846 3060/7196A M
Redox Potential Vs H2		320			mv	ASTM D1498-76M
Specific Conductivity		847	1.0		umhos/cm	DEPT.OF AG, BOOK N9
pH		9.69			su	SW846 9045D
D36852-6A MESA SS6						
Calcium		21.3	2.0		mg/l	SW846 6010C
Magnesium		12.1	1.0		mg/l	SW846 6010C
Sodium		127	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio ^b		5.44			ratio	USDA HANDBOOK 60
D36852-7 MESA SS7						
Chrysene		10.3	10	5.3	ug/kg	SW846 8270C BY SIM
Naphthalene		35.5	14	13	ug/kg	SW846 8270C BY SIM

Summary of Hits

Job Number: D36852
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 07/27/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		14.7	10	5.3	ug/kg	SW846 8270C BY SIM
		625	16	11	mg/kg	SW846-8015B
		6.1	0.12		mg/kg	SW846 6020A
		254	1.2		mg/kg	SW846 6010C
		43.6	1.2		mg/kg	SW846 6010C
		10.4	1.2		mg/kg	SW846 6010C
		10.1	5.8		mg/kg	SW846 6010C
		15.6	3.5		mg/kg	SW846 6010C
		47.8	3.5		mg/kg	SW846 6010C
		43.6	2.2		mg/kg	SW846 3060/7196A M
		311			mv	ASTM D1498-76M
		1450	1.0		umhos/cm	DEPT.OF AG, BOOK N9
		9.91			su	SW846 9045D
D36852-7A MESA SS7						
		15.5	2.0		mg/l	SW846 6010C
		3.82	1.0		mg/l	SW846 6010C
		279	2.0		mg/l	SW846 6010C
		16.4			ratio	USDA HANDBOOK 60
D36852-8 MESA SS8						
		85.2 J	160	79	ug/kg	SW846 8260B
		45.2 J	160	30	ug/kg	SW846 8260B
		500	320	160	ug/kg	SW846 8260B
		55.5	43	22	ug/kg	SW846 8270C BY SIM
		663	43	22	ug/kg	SW846 8270C BY SIM
		777	60	53	ug/kg	SW846 8270C BY SIM
		35.8 J	43	22	ug/kg	SW846 8270C BY SIM
		42.2	16	7.9	mg/kg	SW846 8015B
		608	17	11	mg/kg	SW846-8015B
		7.5	0.12		mg/kg	SW846 6020A
		474	1.2		mg/kg	SW846 6010C
		48.9	1.2		mg/kg	SW846 6010C
		13.3	1.2		mg/kg	SW846 6010C
		10.6	6.2		mg/kg	SW846 6010C
		0.21	0.12		mg/kg	SW846 7471B
		17.6	3.7		mg/kg	SW846 6010C
		53.9	3.7		mg/kg	SW846 6010C
		48.9	2.2		mg/kg	SW846 3060/7196A M
		299			mv	ASTM D1498-76M
		1150	1.0		umhos/cm	DEPT.OF AG, BOOK N9
		9.71			su	SW846 9045D

Summary of Hits

Job Number: D36852
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 07/27/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D36852-8A MESA SS8

Calcium		10.7	2.0		mg/l	SW846 6010C
Magnesium		4.29	1.0		mg/l	SW846 6010C
Sodium		231	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio ^b		15.1			ratio	USDA HANDBOOK 60

D36852-9 MESA SS9

Xylene (total)		154 J	270	140	ug/kg	SW846 8260B
Naphthalene		34.0	14	12	ug/kg	SW846 8270C BY SIM
TPH-DRO (C10-C28)		72.0	16	10	mg/kg	SW846-8015B
Arsenic		7.0	0.12		mg/kg	SW846 6020A
Barium		694	1.2		mg/kg	SW846 6010C
Chromium		37.1	1.2		mg/kg	SW846 6010C
Copper		12.2	1.2		mg/kg	SW846 6010C
Lead		10.2	6.0		mg/kg	SW846 6010C
Nickel		15.0	3.6		mg/kg	SW846 6010C
Zinc		44.9	3.6		mg/kg	SW846 6010C
Chromium, Trivalent ^a		37.1	2.2		mg/kg	SW846 3060/7196A M
Redox Potential Vs H2		288			mv	ASTM D1498-76M
Specific Conductivity		877	1.0		umhos/cm	DEPT.OF AG, BOOK N9
pH		10.03			su	SW846 9045D

D36852-9A MESA SS9

Calcium		19.6	2.0		mg/l	SW846 6010C
Magnesium		6.42	1.0		mg/l	SW846 6010C
Sodium		142	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio ^b		7.11			ratio	USDA HANDBOOK 60

D36852-10 MESA SS10

Naphthalene		22.6	14	12	ug/kg	SW846 8270C BY SIM
TPH-DRO (C10-C28)		16.9	16	10	mg/kg	SW846-8015B
Arsenic		6.2	0.12		mg/kg	SW846 6020A
Barium		325	1.2		mg/kg	SW846 6010C
Chromium		35.2	1.2		mg/kg	SW846 6010C
Copper		10.4	1.2		mg/kg	SW846 6010C
Lead		10.1	6.1		mg/kg	SW846 6010C
Nickel		15.1	3.7		mg/kg	SW846 6010C
Zinc		45.5	3.7		mg/kg	SW846 6010C
Chromium, Trivalent ^a		35.2	2.2		mg/kg	SW846 3060/7196A M
Redox Potential Vs H2		296			mv	ASTM D1498-76M
Specific Conductivity		774	1.0		umhos/cm	DEPT.OF AG, BOOK N9

Summary of Hits

Job Number: D36852
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 07/27/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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pH		9.80			su	SW846 9045D
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D36852-10A MESA SS10

Calcium		11.0	2.0		mg/l	SW846 6010C
Magnesium		3.58	1.0		mg/l	SW846 6010C
Sodium		136	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio ^b		9.11			ratio	USDA HANDBOOK 60

- (a) Calculated as: (Chromium) - (Chromium, Hexavalent)
- (b) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]
- (c) Dilution required due to matrix interference; extract was viscous.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: MESA SS1		Date Sampled: 07/27/12
Lab Sample ID: D36852-1		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 83.5
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22897.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.10 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	69	26	ug/kg	
108-88-3	Toluene	ND	140	69	ug/kg	
100-41-4	Ethylbenzene	ND	140	26	ug/kg	
1330-20-7	Xylene (total)	ND	270	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		61-130%
460-00-4	4-Bromofluorobenzene	95%		53-131%
17060-07-0	1,2-Dichloroethane-D4	94%		62-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS1		Date Sampled: 07/27/12
Lab Sample ID: D36852-1		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 83.5
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10262.D	1	08/01/12	DC	07/31/12	OP6341	E3G469
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	10	5.2	ug/kg	
120-12-7	Anthracene	ND	10	5.2	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	5.2	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	5.2	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	5.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	5.2	ug/kg	
218-01-9	Chrysene	ND	10	5.2	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	5.2	ug/kg	
206-44-0	Fluoranthene	ND	10	5.2	ug/kg	
86-73-7	Fluorene	ND	10	5.2	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	5.2	ug/kg	
91-20-3	Naphthalene	ND	14	12	ug/kg	
129-00-0	Pyrene	ND	10	5.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	89%		10-145%
321-60-8	2-Fluorobiphenyl	95%		10-130%
1718-51-0	Terphenyl-d14	116%		22-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS1	Date Sampled: 07/27/12
Lab Sample ID: D36852-1	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.5
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16922.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	14	6.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	94%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: MESA SS1	Date Sampled: 07/27/12
Lab Sample ID: D36852-1	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.5
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16083.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	16	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	75%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: MESA SS1	Date Sampled: 07/27/12
Lab Sample ID: D36852-1	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.5
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.3	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	223	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 5.9	5.9	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	33.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	11.4	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	10.7	5.9	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.12	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	15.0	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 5.9	5.9	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.6	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	43.9	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS1 Lab Sample ID: D36852-1 Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 07/27/12 Date Received: 07/28/12 Percent Solids: 83.5
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General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	32.7	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	305		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	83.5		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	2230	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.95		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS1	Date Sampled: 07/27/12
Lab Sample ID: D36852-1A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.5
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	8.23	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	2.82	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	277	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.2
4

Report of Analysis

Client Sample ID: MESA SS1	Date Sampled: 07/27/12
Lab Sample ID: D36852-1A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.5
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	21.2		ratio	1	08/03/12 17:59	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

4.2
 4

Report of Analysis

Client Sample ID: MESA SS2		Date Sampled: 07/27/12
Lab Sample ID: D36852-2		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 81.0
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22898.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.07 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	73	28	ug/kg	
108-88-3	Toluene	ND	150	73	ug/kg	
100-41-4	Ethylbenzene	ND	150	28	ug/kg	
1330-20-7	Xylene (total)	ND	290	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		61-130%
460-00-4	4-Bromofluorobenzene	95%		53-131%
17060-07-0	1,2-Dichloroethane-D4	95%		62-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS2		Date Sampled: 07/27/12
Lab Sample ID: D36852-2		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 81.0
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10263.D	1	08/01/12	DC	07/31/12	OP6341	E3G469
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	10	5.3	ug/kg	
120-12-7	Anthracene	ND	10	5.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	5.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	5.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	5.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	5.3	ug/kg	
218-01-9	Chrysene	ND	10	5.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	5.3	ug/kg	
206-44-0	Fluoranthene	ND	10	5.3	ug/kg	
86-73-7	Fluorene	ND	10	5.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	5.3	ug/kg	
91-20-3	Naphthalene	ND	14	13	ug/kg	
129-00-0	Pyrene	ND	10	5.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	77%		10-145%
321-60-8	2-Fluorobiphenyl	82%		10-130%
1718-51-0	Terphenyl-d14	108%		22-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS2	Date Sampled: 07/27/12
Lab Sample ID: D36852-2	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.0
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16923.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	15	7.3	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	90%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: MESA SS2	Date Sampled: 07/27/12
Lab Sample ID: D36852-2	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.0
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16085.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	23.6	16	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	76%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: MESA SS2	Date Sampled: 07/27/12
Lab Sample ID: D36852-2	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.0
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	4.8	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	370	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 6.2	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	35.0	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	10.1	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	10.3	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.12	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	14.6	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 6.2	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.7	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	46.4	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS2	Date Sampled: 07/27/12
Lab Sample ID: D36852-2	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.0
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	34.5	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	306		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	81		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	765	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	10.04		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS2	Date Sampled: 07/27/12
Lab Sample ID: D36852-2A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.0
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	3.89	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	1.93	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	159	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.4
4

Report of Analysis

Client Sample ID: MESA SS2	Date Sampled: 07/27/12
Lab Sample ID: D36852-2A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.0
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	16.5		ratio	1	08/03/12 18:05	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

4.4
 4

Report of Analysis

Client Sample ID: MESA SS3		Date Sampled: 07/27/12
Lab Sample ID: D36852-3		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 79.6
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22899.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.06 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	75	28	ug/kg	
108-88-3	Toluene	ND	150	75	ug/kg	
100-41-4	Ethylbenzene	ND	150	28	ug/kg	
1330-20-7	Xylene (total)	ND	300	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	97%		61-130%
460-00-4	4-Bromofluorobenzene	93%		53-131%
17060-07-0	1,2-Dichloroethane-D4	95%		62-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS3		Date Sampled: 07/27/12
Lab Sample ID: D36852-3		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 79.6
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10264.D	1	08/01/12	DC	07/31/12	OP6341	E3G469
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	10	5.4	ug/kg	
120-12-7	Anthracene	ND	10	5.4	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	5.4	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	5.4	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	5.4	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	5.4	ug/kg	
218-01-9	Chrysene	ND	10	5.4	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	5.4	ug/kg	
206-44-0	Fluoranthene	ND	10	5.4	ug/kg	
86-73-7	Fluorene	ND	10	5.4	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	5.4	ug/kg	
91-20-3	Naphthalene	ND	15	13	ug/kg	
129-00-0	Pyrene	ND	10	5.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	96%		10-145%
321-60-8	2-Fluorobiphenyl	99%		10-130%
1718-51-0	Terphenyl-d14	113%		22-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS3	Date Sampled: 07/27/12
Lab Sample ID: D36852-3	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 79.6
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16924.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	15	7.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
4

Report of Analysis

Client Sample ID: MESA SS3	Date Sampled: 07/27/12
Lab Sample ID: D36852-3	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 79.6
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16087.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	17	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
4

Report of Analysis

Client Sample ID: MESA SS3	Date Sampled: 07/27/12
Lab Sample ID: D36852-3	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 79.6
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.6	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	196	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 6.2	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	35.9	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	10.1	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	10.8	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.13	0.13	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	15.1	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 6.2	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.7	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	43.4	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS3	Date Sampled: 07/27/12
Lab Sample ID: D36852-3	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 79.6
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	35.9	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	314		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	79.6		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	1900	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.81		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS3 Lab Sample ID: D36852-3A Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 07/27/12 Date Received: 07/28/12 Percent Solids: 79.6
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SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	17.4	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	10.1	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	328	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.6
4

Report of Analysis

Client Sample ID: MESA SS3	Date Sampled: 07/27/12
Lab Sample ID: D36852-3A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 79.6
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	15.5		ratio	1	08/03/12 18:12	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS4		Date Sampled: 07/27/12
Lab Sample ID: D36852-4		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 83.0
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22900.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.01 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	70	27	ug/kg	
108-88-3	Toluene	ND	140	70	ug/kg	
100-41-4	Ethylbenzene	ND	140	27	ug/kg	
1330-20-7	Xylene (total)	ND	280	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		61-130%
460-00-4	4-Bromofluorobenzene	94%		53-131%
17060-07-0	1,2-Dichloroethane-D4	94%		62-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS4		Date Sampled: 07/27/12
Lab Sample ID: D36852-4		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 83.0
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10265.D	1	08/01/12	DC	07/31/12	OP6341	E3G469
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	10	5.2	ug/kg	
120-12-7	Anthracene	ND	10	5.2	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	5.2	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	5.2	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	5.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	5.2	ug/kg	
218-01-9	Chrysene	ND	10	5.2	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	5.2	ug/kg	
206-44-0	Fluoranthene	ND	10	5.2	ug/kg	
86-73-7	Fluorene	ND	10	5.2	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	5.2	ug/kg	
91-20-3	Naphthalene	ND	14	12	ug/kg	
129-00-0	Pyrene	ND	10	5.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	85%		10-145%
321-60-8	2-Fluorobiphenyl	86%		10-130%
1718-51-0	Terphenyl-d14	106%		22-130%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.7
4

Report of Analysis

Client Sample ID: MESA SS4	Date Sampled: 07/27/12
Lab Sample ID: D36852-4	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.0
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16925.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	14	7.0	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.7
4

Report of Analysis

Client Sample ID: MESA SS4	Date Sampled: 07/27/12
Lab Sample ID: D36852-4	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.0
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16089.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	16	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.7
4

Report of Analysis

Client Sample ID: MESA SS4	Date Sampled: 07/27/12
Lab Sample ID: D36852-4	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.0
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.6	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	199	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 6.1	6.1	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	36.5	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	8.7	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	9.9	6.1	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.12	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	15.6	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 6.1	6.1	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.7	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	44.3	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS4	Date Sampled: 07/27/12
Lab Sample ID: D36852-4	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.0
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	36.5	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	314		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	83		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	1570	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.78		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS4	Date Sampled: 07/27/12
Lab Sample ID: D36852-4A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.0
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	18.6	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	6.76	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	281	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.8
4

Report of Analysis

Client Sample ID: MESA SS4	Date Sampled: 07/27/12
Lab Sample ID: D36852-4A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 83.0
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	14.2		ratio	1	08/03/12 18:18	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS5		Date Sampled: 07/27/12
Lab Sample ID: D36852-5		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 80.7
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22901.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.06 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	73	28	ug/kg	
108-88-3	Toluene	ND	150	73	ug/kg	
100-41-4	Ethylbenzene	ND	150	28	ug/kg	
1330-20-7	Xylene (total)	ND	290	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		61-130%
460-00-4	4-Bromofluorobenzene	92%		53-131%
17060-07-0	1,2-Dichloroethane-D4	97%		62-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS5		Date Sampled: 07/27/12
Lab Sample ID: D36852-5		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 80.7
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10266.D	1	08/01/12	DC	07/31/12	OP6341	E3G469
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	10	5.3	ug/kg	
120-12-7	Anthracene	ND	10	5.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	5.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	5.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	5.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	5.3	ug/kg	
218-01-9	Chrysene	ND	10	5.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	5.3	ug/kg	
206-44-0	Fluoranthene	ND	10	5.3	ug/kg	
86-73-7	Fluorene	ND	10	5.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	5.3	ug/kg	
91-20-3	Naphthalene	19.2	14	13	ug/kg	
129-00-0	Pyrene	ND	10	5.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	89%		10-145%
321-60-8	2-Fluorobiphenyl	92%		10-130%
1718-51-0	Terphenyl-d14	99%		22-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.9
4

Report of Analysis

Client Sample ID: MESA SS5	Date Sampled: 07/27/12
Lab Sample ID: D36852-5	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 80.7
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16927.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	15	7.3	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	94%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.9
4

Report of Analysis

Client Sample ID: MESA SS5	Date Sampled: 07/27/12
Lab Sample ID: D36852-5	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 80.7
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16091.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	58.7	17	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	82%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.9
4

Report of Analysis

Client Sample ID: MESA SS5	Date Sampled: 07/27/12
Lab Sample ID: D36852-5	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 80.7
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.5	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	219	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 6.0	6.0	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	31.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	15.5	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	11.6	6.0	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.12	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	14.2	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 6.0	6.0	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.6	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	45.3	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS5	Date Sampled: 07/27/12
Lab Sample ID: D36852-5	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 80.7
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	31.2	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	310		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	80.7		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	792	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.80		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS5		Date Sampled: 07/27/12
Lab Sample ID: D36852-5A		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 80.7
Project: Mesa Energy F-01 Pit Closure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	8.28	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	4.07	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	137	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.10
4

Report of Analysis

Client Sample ID: MESA SS5		Date Sampled: 07/27/12
Lab Sample ID: D36852-5A		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 80.7
Project: Mesa Energy F-01 Pit Closure		

4.10
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	9.74		ratio	1	08/03/12 18:45	JM	USDA HANDBOOK 60

(a) Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

RL = Reporting Limit

Technical Report for

Olsson Associates

Mesa Energy F-01 Pit Closure

012-1436

Accutest Job Number: D39027B

Sampling Date: 09/20/12

Report to:

Olsson Associates

jsutrina@oaconsulting.com

ATTN: Jessica Sutrina

Total number of pages in report: **17**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.



Brad Madadian
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

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Sample Summary

Olsson Associates

Job No: D39027B

Mesa Energy F-01 Pit Closure
Project No: 012-1436

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D39027-1B	09/20/12	14:50 SG	09/22/12	SO	Soil	F01 SS1
D39027-2B	09/20/12	15:30 SG	09/22/12	SO	Soil	F01 SS2
D39027-3B	09/20/12	15:55 SG	09/22/12	SO	Soil	F01 SS3

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D39027B

Site: Mesa Energy F-01 Pit Closure

Report Date 9/27/2012 11:33:23 AM

On 09/22/2012, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.0 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D39027B was assigned to the project. The lab sample IDs, client sample IDs, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix SO	Batch ID: V5V1447
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39025-1MS, D39025-1MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB971
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39025-1MS, D39025-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP6706
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39017-1MS, D39017-1MSD were used as the QC samples indicated.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D39027B
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 09/20/12

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
D39027-1B	F01 SS1					
		Benzene	84.4	64	32	ug/kg SW846 8260B
		Toluene	479	130	64	ug/kg SW846 8260B
		Ethylbenzene	79.2 J	130	24	ug/kg SW846 8260B
		Xylene (total)	738	260	130	ug/kg SW846 8260B
		TPH-GRO (C6-C10)	9.05 J	13	6.4	mg/kg SW846 8015B
		TPH-DRO (C10-C28)	411	15	10	mg/kg SW846-8015B
D39027-2B	F01 SS2					
		Toluene	192	140	69	ug/kg SW846 8260B
		Ethylbenzene	36.7 J	140	26	ug/kg SW846 8260B
		Xylene (total)	303	280	140	ug/kg SW846 8260B
		TPH-GRO (C6-C10)	7.20 J	14	6.9	mg/kg SW846 8015B
		TPH-DRO (C10-C28)	432	16	10	mg/kg SW846-8015B
D39027-3B	F01 SS3					
		Toluene	74.3 J	130	66	ug/kg SW846 8260B
		Xylene (total)	155 J	260	130	ug/kg SW846 8260B
		TPH-DRO (C10-C28)	567	15	10	mg/kg SW846-8015B

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: F01 SS1		
Lab Sample ID: D39027-1B		Date Sampled: 09/20/12
Matrix: SO - Soil		Date Received: 09/22/12
Method: SW846 8260B		Percent Solids: 86.6
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V23812.D	1	09/24/12	BD	n/a	n/a	V5V1447
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.10 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	84.4	64	32	ug/kg	
108-88-3	Toluene	479	130	64	ug/kg	
100-41-4	Ethylbenzene	79.2	130	24	ug/kg	J
1330-20-7	Xylene (total)	738	260	130	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	98%		64-130%
460-00-4	4-Bromofluorobenzene	100%		62-131%
17060-07-0	1,2-Dichloroethane-D4	101%		70-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: F01 SS1	
Lab Sample ID: D39027-1B	Date Sampled: 09/20/12
Matrix: SO - Soil	Date Received: 09/22/12
Method: SW846 8015B	Percent Solids: 86.6
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB17699.D	1	09/24/12	SK	n/a	n/a	GGB971
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	9.05	13	6.4	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	93%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: F01 SS1	
Lab Sample ID: D39027-1B	Date Sampled: 09/20/12
Matrix: SO - Soil	Date Received: 09/22/12
Method: SW846-8015B SW846 3510C	Percent Solids: 86.6
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD17873.D	1	09/26/12	AV	09/26/12	OP6706	GFD910
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	411	15	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	80%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: F01 SS2	
Lab Sample ID: D39027-2B	Date Sampled: 09/20/12
Matrix: SO - Soil	Date Received: 09/22/12
Method: SW846 8260B	Percent Solids: 83.6
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V23813.D	1	09/24/12	BD	n/a	n/a	V5V1447
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.05 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	69	35	ug/kg	
108-88-3	Toluene	192	140	69	ug/kg	
100-41-4	Ethylbenzene	36.7	140	26	ug/kg	J
1330-20-7	Xylene (total)	303	280	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	99%		64-130%
460-00-4	4-Bromofluorobenzene	98%		62-131%
17060-07-0	1,2-Dichloroethane-D4	99%		70-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.2
4

Report of Analysis

Client Sample ID: F01 SS2	
Lab Sample ID: D39027-2B	Date Sampled: 09/20/12
Matrix: SO - Soil	Date Received: 09/22/12
Method: SW846 8015B	Percent Solids: 83.6
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB17700.D	1	09/24/12	SK	n/a	n/a	GGB971
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	7.20	14	6.9	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	94%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.2
4

Report of Analysis

Client Sample ID: F01 SS2	Date Sampled: 09/20/12
Lab Sample ID: D39027-2B	Date Received: 09/22/12
Matrix: SO - Soil	Percent Solids: 83.6
Method: SW846-8015B SW846 3510C	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD17875.D	1	09/26/12	AV	09/26/12	OP6706	GFD910
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	432	16	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	95%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.2
4

Report of Analysis

Client Sample ID: F01 SS3	
Lab Sample ID: D39027-3B	Date Sampled: 09/20/12
Matrix: SO - Soil	Date Received: 09/22/12
Method: SW846 8260B	Percent Solids: 86.1
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V23814.D	1	09/24/12	BD	n/a	n/a	V5V1447
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.04 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	66	33	ug/kg	
108-88-3	Toluene	74.3	130	66	ug/kg	J
100-41-4	Ethylbenzene	ND	130	25	ug/kg	
1330-20-7	Xylene (total)	155	260	130	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	98%		64-130%
460-00-4	4-Bromofluorobenzene	98%		62-131%
17060-07-0	1,2-Dichloroethane-D4	98%		70-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: F01 SS3	
Lab Sample ID: D39027-3B	Date Sampled: 09/20/12
Matrix: SO - Soil	Date Received: 09/22/12
Method: SW846 8015B	Percent Solids: 86.1
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB17701.D	1	09/24/12	SK	n/a	n/a	GGB971
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.6	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: F01 SS3	Date Sampled: 09/20/12
Lab Sample ID: D39027-3B	Date Received: 09/22/12
Matrix: SO - Soil	Percent Solids: 86.1
Method: SW846-8015B SW846 3510C	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD17877.D	1	09/26/12	AV	09/26/12	OP6706	GFD910
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	567	15	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	97%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

10165 Harwin Drive, Houston, TX 77036 ; Phone 713-271-4700 ; Fax 713-271-4770

FED-EX Tracking #	Bottle Order Control #
Accutest Quote	Accutest Job # D 39027

Client / Reporting Information		Project Information		Requested Analyses										Matrix Codes							
Company Name Olsson Associates		Project Name / No. Mesa Energy F01												DW - Drinking Water							
Project Contact Stuart Hall		Bill to Olsson Associates												GW - Ground Water							
E-Mail shall@oaconsulting.com		Invoice Attn. Stuart Hall												WW - Wastewater							
Address 826 21 1/2 Road		Address 826 21 1/2 Road												SO - Soil							
City Grand Junction		City Grand Junction												SL - Sludge							
State CO		State CO												OI - Oil							
Zip 81505		Zip 81505												LIQ - Liquid							
Phone No.		Phone No. 970-263-7800												SOL - Other Solid							
Fax No.		Fax No.																			
Samplers Name Steve Gonzale		Client Purchase Order # 012-1436																			
Accutest Sample #	Field ID / Point of Collection	Collection										TPH (GRO)	TPH (DRO)	BTEX	PAH (See List 1)	Electrical Conductivity	Sodium Adsorption Ratio	pH	Metals (See List 2)	Arsenic only	LAB USE ONLY
		Date	Time	Matrix	# of bottles	HCl	NaOH	PHOS	SS/PA	EN/DO	NH3/NO										
F01 SS1		9/20/2012	1450	SS	4								X	X	X	X	X	X	X	X	01
F01 SS2			1530	SS	4								X	X	X	X	X	X	X	X	02
F01 SS3			1555	SS	4								X	X	X	X	X	X	X	X	03

Turnaround Time (Business days)		Data Deliverable Information		Comments / Remarks	
<input type="checkbox"/> 10 Day STANDARD <input type="checkbox"/> 7 Day (per contract) <input checked="" type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <input type="checkbox"/> Other		Approved By/ Date: _____ <input type="checkbox"/> Commercial "A" <input checked="" type="checkbox"/> Commercial "B" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Data Package Commercial "A" = Results Only Commercial "B" = Results & Standard QC		AMS FEDEX Account Number - 487721860 List 1 - Acenaphthene, Anthracene, Benzo(A)anthracene, Benzo(B)fluoranthene, Benzo(K)fluoranthene, Benzo(A)pyrene, Chrysene, Dibenzo(A,H)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3,C,D)pyrene, Napthalene, Pyrene List 2 - As, Ba, Cd, Cr3, Cr6, Cu, Pb, Hg, Ni, Se, Ag, Zn	

Real time analytical data available via Lablink

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by: <i>Stuart Hall</i>	Date Time: 9-21 12:17	Received By: 1	Relinquished By: 2	Date Time: FK	Received By: <i>AK</i>
Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By: <i>AK</i>
Relinquished by:	Date Time:	Received By:	Custody Seal #		On Ice <input type="checkbox"/> Cooler Temp. 4.0

D39027B: Chain of Custody

Page 1 of 1

5.1
5

Report of Analysis

Client Sample ID: MESA SS6	Date Sampled: 07/27/12
Lab Sample ID: D36852-6	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 87.6
Method: SW846 8260B	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22902.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.02 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	64	24	ug/kg	
108-88-3	Toluene	ND	130	64	ug/kg	
100-41-4	Ethylbenzene	ND	130	24	ug/kg	
1330-20-7	Xylene (total)	ND	260	130	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	97%		61-130%
460-00-4	4-Bromofluorobenzene	93%		53-131%
17060-07-0	1,2-Dichloroethane-D4	96%		62-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.11
4

Report of Analysis

Client Sample ID: MESA SS6		Date Sampled: 07/27/12
Lab Sample ID: D36852-6		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 87.6
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10377.D	1	08/09/12	DC	07/31/12	OP6341	E3G475
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	9.5	4.9	ug/kg	
120-12-7	Anthracene	ND	9.5	4.9	ug/kg	
56-55-3	Benzo(a)anthracene	ND	9.5	4.9	ug/kg	
50-32-8	Benzo(a)pyrene	ND	9.5	4.9	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	9.5	4.9	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	9.5	4.9	ug/kg	
218-01-9	Chrysene	ND	9.5	4.9	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.5	4.9	ug/kg	
206-44-0	Fluoranthene	ND	9.5	4.9	ug/kg	
86-73-7	Fluorene	ND	9.5	4.9	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.5	4.9	ug/kg	
91-20-3	Naphthalene	ND	13	12	ug/kg	
129-00-0	Pyrene	ND	9.5	4.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	84%		10-145%
321-60-8	2-Fluorobiphenyl	70%		10-130%
1718-51-0	Terphenyl-d14	80%		22-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.11
4

Report of Analysis

Client Sample ID: MESA SS6	Date Sampled: 07/27/12
Lab Sample ID: D36852-6	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 87.6
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16928.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.11
4

Report of Analysis

Client Sample ID: MESA SS6	Date Sampled: 07/27/12
Lab Sample ID: D36852-6	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 87.6
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16093.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	15	9.8	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	76%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.11
4

Report of Analysis

Client Sample ID: MESA SS6	Date Sampled: 07/27/12
Lab Sample ID: D36852-6	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 87.6
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.4	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	170	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 5.8	5.8	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	35.6	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	10.9	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	9.8	5.8	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.12	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	14.8	3.5	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 5.8	5.8	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.5	3.5	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	42.0	3.5	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS6	Date Sampled: 07/27/12
Lab Sample ID: D36852-6	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 87.6
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	35.6	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	320		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	87.6		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	847	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.69		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS6	Date Sampled: 07/27/12
Lab Sample ID: D36852-6A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 87.6
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	21.3	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	12.1	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	127	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.12
 4

Report of Analysis

Client Sample ID: MESA SS6	Date Sampled: 07/27/12
Lab Sample ID: D36852-6A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 87.6
Project: Mesa Energy F-01 Pit Closure	

4.12
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	5.44		ratio	1	08/03/12 18:51	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS7		Date Sampled: 07/27/12
Lab Sample ID: D36852-7		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 81.9
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22903.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.02 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	72	27	ug/kg	
108-88-3	Toluene	ND	140	72	ug/kg	
100-41-4	Ethylbenzene	ND	140	27	ug/kg	
1330-20-7	Xylene (total)	ND	290	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		61-130%
460-00-4	4-Bromofluorobenzene	92%		53-131%
17060-07-0	1,2-Dichloroethane-D4	98%		62-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS7		
Lab Sample ID: D36852-7		Date Sampled: 07/27/12
Matrix: SO - Soil		Date Received: 07/28/12
Method: SW846 8270C BY SIM SW846 3546		Percent Solids: 81.9
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10378.D	1	08/09/12	DC	07/31/12	OP6341	E3G475
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	10	5.3	ug/kg	
120-12-7	Anthracene	ND	10	5.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	5.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	5.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	5.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	5.3	ug/kg	
218-01-9	Chrysene	10.3	10	5.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	5.3	ug/kg	
206-44-0	Fluoranthene	ND	10	5.3	ug/kg	
86-73-7	Fluorene	ND	10	5.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	5.3	ug/kg	
91-20-3	Naphthalene	35.5	14	13	ug/kg	
129-00-0	Pyrene	14.7	10	5.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	92%		10-145%
321-60-8	2-Fluorobiphenyl	80%		10-130%
1718-51-0	Terphenyl-d14	88%		22-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS7	Date Sampled: 07/27/12
Lab Sample ID: D36852-7	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.9
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16929.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	14	7.2	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.13
4

Report of Analysis

Client Sample ID: MESA SS7	Date Sampled: 07/27/12
Lab Sample ID: D36852-7	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.9
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16095.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	625	16	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	82%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.13
4

Report of Analysis

Client Sample ID: MESA SS7 Lab Sample ID: D36852-7 Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 07/27/12 Date Received: 07/28/12 Percent Solids: 81.9
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Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.1	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	254	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 5.8	5.8	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	43.6	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	10.4	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	10.1	5.8	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.11	0.11	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	15.6	3.5	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 5.8	5.8	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.5	3.5	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	47.8	3.5	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

4.13
4

Report of Analysis

Client Sample ID: MESA SS7	Date Sampled: 07/27/12
Lab Sample ID: D36852-7	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.9
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	43.6	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	311		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	81.9		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	1450	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.91		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS7	Date Sampled: 07/27/12
Lab Sample ID: D36852-7A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.9
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	15.5	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	3.82	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	279	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.14
4

Report of Analysis

Client Sample ID: MESA SS7	Date Sampled: 07/27/12
Lab Sample ID: D36852-7A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 81.9
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	16.4		ratio	1	08/03/12 18:58	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

4.14
 4

Report of Analysis

Client Sample ID: MESA SS8	Date Sampled: 07/27/12
Lab Sample ID: D36852-8	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 77.5
Method: SW846 8260B	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22906.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.00 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	79	30	ug/kg	
108-88-3	Toluene	85.2	160	79	ug/kg	J
100-41-4	Ethylbenzene	45.2	160	30	ug/kg	J
1330-20-7	Xylene (total)	500	320	160	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	95%		61-130%
460-00-4	4-Bromofluorobenzene	105%		53-131%
17060-07-0	1,2-Dichloroethane-D4	96%		62-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.15
4

Report of Analysis

Client Sample ID: MESA SS8		Date Sampled: 07/27/12
Lab Sample ID: D36852-8		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 77.5
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G10387.D	4	08/09/12	DC	07/31/12	OP6341	E3G475
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	43	22	ug/kg	
120-12-7	Anthracene	ND	43	22	ug/kg	
56-55-3	Benzo(a)anthracene	ND	43	22	ug/kg	
50-32-8	Benzo(a)pyrene	ND	43	22	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	43	22	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	43	22	ug/kg	
218-01-9	Chrysene	55.5	43	22	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	43	22	ug/kg	
206-44-0	Fluoranthene	ND	43	22	ug/kg	
86-73-7	Fluorene	663	43	22	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	43	22	ug/kg	
91-20-3	Naphthalene	777	60	53	ug/kg	
129-00-0	Pyrene	35.8	43	22	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	82%		10-145%
321-60-8	2-Fluorobiphenyl	80%		10-130%
1718-51-0	Terphenyl-d14	84%		22-130%

(a) Dilution required due to matrix interference; extract was viscous.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.15
4

Report of Analysis

Client Sample ID: MESA SS8	Date Sampled: 07/27/12
Lab Sample ID: D36852-8	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 77.5
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16930.D	1	07/30/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	42.2	16	7.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	136%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.15
4

Report of Analysis

Client Sample ID: MESA SS8 Lab Sample ID: D36852-8 Matrix: SO - Soil Method: SW846-8015B SW846 3546 Project: Mesa Energy F-01 Pit Closure	Date Sampled: 07/27/12 Date Received: 07/28/12 Percent Solids: 77.5
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	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16097.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	608	17	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	83%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.15
4

Report of Analysis

Client Sample ID: MESA SS8	Date Sampled: 07/27/12
Lab Sample ID: D36852-8	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 77.5
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.5	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	474	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 6.2	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	48.9	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	13.3	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	10.6	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	0.21	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	17.6	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 6.2	6.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.7	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	53.9	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS8	Date Sampled: 07/27/12
Lab Sample ID: D36852-8	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 77.5
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	48.9	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	299		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	77.5		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	1150	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.71		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS8	Date Sampled: 07/27/12
Lab Sample ID: D36852-8A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 77.5
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	10.7	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	4.29	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	231	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.16
4

Report of Analysis

Client Sample ID: MESA SS8	Date Sampled: 07/27/12
Lab Sample ID: D36852-8A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 77.5
Project: Mesa Energy F-01 Pit Closure	

4.16
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	15.1		ratio	1	08/03/12 19:05	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS9		Date Sampled: 07/27/12
Lab Sample ID: D36852-9		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 84.4
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22904.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.01 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	68	26	ug/kg	
108-88-3	Toluene	ND	140	68	ug/kg	
100-41-4	Ethylbenzene	ND	140	26	ug/kg	
1330-20-7	Xylene (total)	154	270	140	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		61-130%
460-00-4	4-Bromofluorobenzene	91%		53-131%
17060-07-0	1,2-Dichloroethane-D4	93%		62-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS9		Date Sampled: 07/27/12
Lab Sample ID: D36852-9		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 84.4
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10270.D	1	08/02/12	DC	07/31/12	OP6341	E3G469
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	9.8	5.1	ug/kg	
120-12-7	Anthracene	ND	9.8	5.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	9.8	5.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	9.8	5.1	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	9.8	5.1	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	9.8	5.1	ug/kg	
218-01-9	Chrysene	ND	9.8	5.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.8	5.1	ug/kg	
206-44-0	Fluoranthene	ND	9.8	5.1	ug/kg	
86-73-7	Fluorene	ND	9.8	5.1	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.8	5.1	ug/kg	
91-20-3	Naphthalene	34.0	14	12	ug/kg	
129-00-0	Pyrene	ND	9.8	5.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	92%		10-145%
321-60-8	2-Fluorobiphenyl	101%		10-130%
1718-51-0	Terphenyl-d14	112%		22-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS9	Date Sampled: 07/27/12
Lab Sample ID: D36852-9	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 84.4
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16931.D	1	07/31/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	14	6.8	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.17
4

Report of Analysis

Client Sample ID: MESA SS9	Date Sampled: 07/27/12
Lab Sample ID: D36852-9	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 84.4
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16099.D	1	08/02/12	AW	08/02/12	OP6355	GFD829
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	72.0	16	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	77%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.17
4

Report of Analysis

Client Sample ID: MESA SS9	Date Sampled: 07/27/12
Lab Sample ID: D36852-9	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 84.4
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.0	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	694	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 6.0	6.0	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	37.1	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	12.2	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	10.2	6.0	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.12	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	15.0	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 6.0	6.0	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.6	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	44.9	3.6	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS9	Date Sampled: 07/27/12
Lab Sample ID: D36852-9	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 84.4
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	37.1	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	288		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	84.4		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	877	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	10.03		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS9	Date Sampled: 07/27/12
Lab Sample ID: D36852-9A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 84.4
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	19.6	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	6.42	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	142	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.18
4

Report of Analysis

Client Sample ID: MESA SS9		Date Sampled: 07/27/12
Lab Sample ID: D36852-9A		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 84.4
Project: Mesa Energy F-01 Pit Closure		

4.18
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	7.11		ratio	1	08/03/12 19:11	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS10		Date Sampled: 07/27/12
Lab Sample ID: D36852-10		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 82.7
Method: SW846 8260B		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V22905.D	1	08/02/12	BD	n/a	n/a	V5V1397
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.05 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	70	27	ug/kg	
108-88-3	Toluene	ND	140	70	ug/kg	
100-41-4	Ethylbenzene	ND	140	27	ug/kg	
1330-20-7	Xylene (total)	ND	280	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	97%		61-130%
460-00-4	4-Bromofluorobenzene	94%		53-131%
17060-07-0	1,2-Dichloroethane-D4	92%		62-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS10		Date Sampled: 07/27/12
Lab Sample ID: D36852-10		Date Received: 07/28/12
Matrix: SO - Soil		Percent Solids: 82.7
Method: SW846 8270C BY SIM SW846 3546		
Project: Mesa Energy F-01 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G10271.D	1	08/02/12	DC	07/31/12	OP6341	E3G469
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	10	5.2	ug/kg	
120-12-7	Anthracene	ND	10	5.2	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	5.2	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	5.2	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	5.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	5.2	ug/kg	
218-01-9	Chrysene	ND	10	5.2	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	10	5.2	ug/kg	
206-44-0	Fluoranthene	ND	10	5.2	ug/kg	
86-73-7	Fluorene	ND	10	5.2	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	5.2	ug/kg	
91-20-3	Naphthalene	22.6	14	12	ug/kg	
129-00-0	Pyrene	ND	10	5.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	93%		10-145%
321-60-8	2-Fluorobiphenyl	101%		10-130%
1718-51-0	Terphenyl-d14	110%		22-130%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MESA SS10	Date Sampled: 07/27/12
Lab Sample ID: D36852-10	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 82.7
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB16932.D	1	07/31/12	SK	n/a	n/a	GGB933
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	14	7.0	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.19
4

Report of Analysis

Client Sample ID: MESA SS10	Date Sampled: 07/27/12
Lab Sample ID: D36852-10	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 82.7
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD16148.D	1	08/03/12	AW	08/03/12	OP6366	GFD832
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	16.9	16	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	72%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.19
4

Report of Analysis

Client Sample ID: MESA SS10	Date Sampled: 07/27/12
Lab Sample ID: D36852-10	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 82.7
Project: Mesa Energy F-01 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.2	0.12	mg/kg	5	07/30/12	08/02/12 JB	SW846 6020A ³	SW846 3050B ⁷
Barium	325	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Boron	< 6.1	6.1	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Cadmium	< 1.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Chromium	35.2	1.2	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Copper	10.4	1.2	mg/kg	1	07/30/12	08/03/12 JB	SW846 6010C ⁴	SW846 3050B ⁶
Lead	10.1	6.1	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Mercury	< 0.12	0.12	mg/kg	1	07/30/12	07/30/12 JM	SW846 7471B ¹	SW846 7471B ⁵
Nickel	15.1	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Selenium	< 6.1	6.1	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Silver	< 3.7	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶
Zinc	45.5	3.7	mg/kg	1	07/30/12	08/01/12 JB	SW846 6010C ²	SW846 3050B ⁶

- (1) Instrument QC Batch: MA2663
- (2) Instrument QC Batch: MA2676
- (3) Instrument QC Batch: MA2679
- (4) Instrument QC Batch: MA2680
- (5) Prep QC Batch: MP8019
- (6) Prep QC Batch: MP8022
- (7) Prep QC Batch: MP8023

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS10	Date Sampled: 07/27/12
Lab Sample ID: D36852-10	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 82.7
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	08/03/12	CJ	SW846 3060A/7196A
Chromium, Trivalent ^a	35.2	2.2	mg/kg	1	08/03/12	CJ	SW846 3060/7196A M
Redox Potential Vs H2	296		mv	1	07/30/12	CT	ASTM D1498-76M
Solids, Percent	82.7		%	1	07/31/12	SWT	SM19 2540B M
Specific Conductivity	774	1.0	umhos/cm	1	08/03/12	JD	DEPT.OF AG, BOOK N9
pH	9.80		su	1	07/30/12 09:30	CT	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: MESA SS10 Lab Sample ID: D36852-10A Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 07/27/12 Date Received: 07/28/12 Percent Solids: 82.7
--	--

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	11.0	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	3.58	1.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	136	2.0	mg/l	1	08/03/12	08/03/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2681

(2) Prep QC Batch: MP8058

RL = Reporting Limit

4.20
4

Report of Analysis

Client Sample ID: MESA SS10	Date Sampled: 07/27/12
Lab Sample ID: D36852-10A	Date Received: 07/28/12
Matrix: SO - Soil	Percent Solids: 82.7
Project: Mesa Energy F-01 Pit Closure	

4.20
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	9.11		ratio	1	08/03/12 19:18	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D36852

Client: OLSSON

Immediate Client Services Action Required: No

Date / Time Received: 7/28/2012 10:15:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: MESA

Airbill #'s: fx

<u>Cooler Security</u>	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Accutest Laboratories
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4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www.accutest.com

5.1
5



10/23/12

Technical Report for

Olsson Associates

Mesa Energy F-01 Pit Closure

012-1436

Accutest Job Number: D39633

Sampling Date: 10/08/12

Report to:

Olsson Associates

jsutrina@oaconsulting.com

ATTN: Jessica Sutrina

Total number of pages in report: **37**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Brad Madadian
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

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Test results relate only to samples analyzed.

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Sample Summary

Olsson Associates

Job No: D39633

Mesa Energy F-01 Pit Closure
 Project No: 012-1436

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D39633-1	10/08/12	12:10 JS	10/09/12	SO	Soil	MESA F01 CUT1
D39633-1A	10/08/12	12:10 JS	10/09/12	SO	Soil	MESA F01 CUT1
D39633-2	10/08/12	12:15 JS	10/09/12	SO	Soil	MESA F01 CUT2
D39633-2A	10/08/12	12:15 JS	10/09/12	SO	Soil	MESA F01 CUT2
D39633-3	10/08/12	12:20 JS	10/09/12	SO	Soil	MESA F01 CUT3
D39633-3A	10/08/12	12:20 JS	10/09/12	SO	Soil	MESA F01 CUT3

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D39633

Site: Mesa Energy F-01 Pit Closure

Report Date 10/23/2012 10:33:39 A

On 10/09/2012, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D39633 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix LEACHATE	Batch ID: V5V1467
------------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix SO	Batch ID: V5V1467
------------------	--------------------------

- Sample(s) D39689-1MS, D39689-1MSD were used as the QC samples indicated.
- The RPD(s) for the MS and MSD recoveries of Benzene, Ethylbenzene, Xylene (total) are outside control limits for sample D39689-1MSD. Probable cause due to sample homogeneity.
- D39689-1MSD: Recoveries outside control limits due to matrix interference.
- D39689-1MS: Recoveries outside control limits due to matrix interference.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix SO	Batch ID: OP6793
------------------	-------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D39736-1MS, D39736-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB982
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39610-1MS, D39610-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP6791
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- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D39633-1MS, D39633-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010C

Matrix AQ

Batch ID: MP8648

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39610-1MS, D39610-1MSD, D39610-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Sodium are outside control limits for sample MP8648-SD1. Probable cause due to sample homogeneity.
- MP8648-SD1 for Sodium: Serial dilution indicates possible matrix interference.

Matrix SO

Batch ID: MP8609

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39541-1MSD, D39541-1SDL, D39541-1MS, D39541-1MSD were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Barium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- The serial dilution RPD(s) for Lead, Silver, Nickel, Zinc are outside control limits for sample MP8609-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP8609-SD1 for Zinc: Serial dilution indicates possible matrix interference.
- MP8609-SD1 for Nickel: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020A

Matrix SO

Batch ID: MP8610

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39541-1MS, D39541-1MSD, D39541-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP8610-SD1. Probable cause due to sample homogeneity.
- MP8610-SD1 for Arsenic: Serial dilution indicates possible matrix interference.

Metals By Method SW846 7471B

Matrix SO

Batch ID: MP8630

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39589-1MS, D39589-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method ASTM D1498-76M

Matrix SO

Batch ID: GN17204

- Sample(s) D39633-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

Wet Chemistry By Method SM19 2540B M

Matrix SO

Batch ID: GN17164

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SM2510B-1997 MOD

Matrix SO	Batch ID: GP8416
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- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO	Batch ID: R14780
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- The data for SW846 3060/7196A M meets quality control requirements.
- D39633-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO	Batch ID: R14781
------------------	-------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- D39633-2 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Matrix SO	Batch ID: R14782
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- The data for SW846 3060/7196A M meets quality control requirements.
- D39633-3 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO	Batch ID: GP8391
------------------	-------------------------

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39633-2DUP, D39633-2MS, D39633-2MSD were used as the QC samples for the Chromium, Hexavalent analysis.

Wet Chemistry By Method USDA HANDBOOK 60

Matrix SO	Batch ID: MP8648
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- D39633-1A for Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$
- D39633-2A for Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$
- D39633-3A for Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D39633
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 10/08/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D39633-1 MESA F01 CUT1

Benzene	46.6 J	58	29	ug/kg	SW846 8260B
Toluene	329	120	58	ug/kg	SW846 8260B
Ethylbenzene	57.4 J	120	22	ug/kg	SW846 8260B
Xylene (total)	693	230	120	ug/kg	SW846 8260B
Chrysene	34.5	9.1	4.7	ug/kg	SW846 8270C BY SIM
Fluoranthene	14.1	9.1	4.7	ug/kg	SW846 8270C BY SIM
Naphthalene	143	13	11	ug/kg	SW846 8270C BY SIM
Pyrene	20.8	9.1	4.7	ug/kg	SW846 8270C BY SIM
TPH-GRO (C6-C10)	6.19 J	12	5.8	mg/kg	SW846 8015B
TPH-DRO (C10-C28)	275	14	9.4	mg/kg	SW846-8015B
Arsenic	8.0	0.11		mg/kg	SW846 6020A
Barium	1590	1.1		mg/kg	SW846 6010C
Chromium	29.9	1.1		mg/kg	SW846 6010C
Copper	13.4	1.1		mg/kg	SW846 6010C
Lead	9.1	5.5		mg/kg	SW846 6010C
Mercury	0.12	0.11		mg/kg	SW846 7471B
Nickel	12.9	3.3		mg/kg	SW846 6010C
Zinc	65.1	3.3		mg/kg	SW846 6010C
Specific Conductivity	2160	1.0		umhos/cm	SM2510B-1997 MOD
Chromium, Trivalent ^a	29.9	2.1		mg/kg	SW846 3060/7196A M
Redox Potential Vs H2	225			mv	ASTM D1498-76M
pH	9.58			su	SW846 9045D

D39633-1A MESA F01 CUT1

Calcium	62.9	2.0		mg/l	SW846 6010C
Magnesium	22.6	1.0		mg/l	SW846 6010C
Sodium	427	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio ^b	11.7			ratio	USDA HANDBOOK 60

D39633-2 MESA F01 CUT2

Benzene	34.7 J	59	29	ug/kg	SW846 8260B
Toluene	194	120	59	ug/kg	SW846 8260B
Ethylbenzene	38.0 J	120	22	ug/kg	SW846 8260B
Xylene (total)	376	230	120	ug/kg	SW846 8260B
Chrysene	26.7	9.1	4.7	ug/kg	SW846 8270C BY SIM
Fluoranthene	12.1	9.1	4.7	ug/kg	SW846 8270C BY SIM
Naphthalene	110	13	11	ug/kg	SW846 8270C BY SIM
Pyrene	18.7	9.1	4.7	ug/kg	SW846 8270C BY SIM
TPH-DRO (C10-C28)	422	15	9.4	mg/kg	SW846-8015B
Arsenic	7.1	0.11		mg/kg	SW846 6020A
Barium	1430	1.1		mg/kg	SW846 6010C

Summary of Hits

Job Number: D39633
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 10/08/12



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method	
		Chromium	30.1	1.1	mg/kg	SW846 6010C	
		Copper	13.6	1.1	mg/kg	SW846 6010C	
		Lead	10.6	5.5	mg/kg	SW846 6010C	
		Mercury	0.18	0.11	mg/kg	SW846 7471B	
		Nickel	13.4	3.3	mg/kg	SW846 6010C	
		Zinc	58.6	3.3	mg/kg	SW846 6010C	
		Specific Conductivity	2400	1.0	umhos/cm	SM2510B-1997 MOD	
		Chromium, Trivalent ^a	30.1	2.1	mg/kg	SW846 3060/7196A M	
		Redox Potential Vs H2	222		mv	ASTM D1498-76M	
		pH	9.60		su	SW846 9045D	
D39633-2A MESA F01 CUT2							
		Calcium	67.4	2.0	mg/l	SW846 6010C	
		Magnesium	22.7	1.0	mg/l	SW846 6010C	
		Sodium	444	2.0	mg/l	SW846 6010C	
		Sodium Adsorption Ratio ^b	11.9		ratio	USDA HANDBOOK 60	
D39633-3 MESA F01 CUT3							
		Benzene	35.1 J	58	29	ug/kg	SW846 8260B
		Toluene	184	120	58	ug/kg	SW846 8260B
		Ethylbenzene	34.0 J	120	22	ug/kg	SW846 8260B
		Xylene (total)	357	230	120	ug/kg	SW846 8260B
		Chrysene	26.7	9.0	4.7	ug/kg	SW846 8270C BY SIM
		Fluoranthene	10.1	9.0	4.7	ug/kg	SW846 8270C BY SIM
		Fluorene	33.4	9.0	4.7	ug/kg	SW846 8270C BY SIM
		Naphthalene	122	13	11	ug/kg	SW846 8270C BY SIM
		Pyrene	18.1	9.0	4.7	ug/kg	SW846 8270C BY SIM
		TPH-DRO (C10-C28)	169	15	9.4	mg/kg	SW846-8015B
		Arsenic	9.0	0.11		mg/kg	SW846 6020A
		Barium	1530	1.1		mg/kg	SW846 6010C
		Chromium	31.4	1.1		mg/kg	SW846 6010C
		Copper	13.0	1.1		mg/kg	SW846 6010C
		Lead	9.7	5.4		mg/kg	SW846 6010C
		Nickel	14.2	3.3		mg/kg	SW846 6010C
		Zinc	58.4	3.3		mg/kg	SW846 6010C
		Specific Conductivity	2790	1.0		umhos/cm	SM2510B-1997 MOD
		Chromium, Trivalent ^a	31.4	2.1		mg/kg	SW846 3060/7196A M
		Redox Potential Vs H2	19.9			mv	ASTM D1498-76M
		pH	9.54			su	SW846 9045D
D39633-3A MESA F01 CUT3							
		Calcium	80.1	2.0		mg/l	SW846 6010C

Summary of Hits

Job Number: D39633
Account: Olsson Associates
Project: Mesa Energy F-01 Pit Closure
Collected: 10/08/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		31.2	1.0		mg/l	SW846 6010C
		493	2.0		mg/l	SW846 6010C
		11.8			ratio	USDA HANDBOOK 60

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

(b) Calculated as: $(\text{Na meq/L}) / \text{sqrt} [(\text{Ca meq/L}) + (\text{Mg meq/L})/2]$

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: MESA F01 CUT1	Date Sampled: 10/08/12
Lab Sample ID: D39633-1	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 92.0
Method: SW846 8260B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V24113.D	1	10/11/12	BD	n/a	n/a	V5V1467
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.05 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	46.6	58	29	ug/kg	J
108-88-3	Toluene	329	120	58	ug/kg	
100-41-4	Ethylbenzene	57.4	120	22	ug/kg	J
1330-20-7	Xylene (total)	693	230	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		64-130%
460-00-4	4-Bromofluorobenzene	98%		62-131%
17060-07-0	1,2-Dichloroethane-D4	103%		70-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: MESA F01 CUT1	Date Sampled: 10/08/12
Lab Sample ID: D39633-1	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 92.0
Method: SW846 8270C BY SIM SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G11664.D	1	10/12/12	DC	10/12/12	OP6793	E3G549
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	9.1	4.7	ug/kg	
120-12-7	Anthracene	ND	9.1	4.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	9.1	4.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	9.1	4.7	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	9.1	4.7	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	9.1	4.7	ug/kg	
218-01-9	Chrysene	34.5	9.1	4.7	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.1	4.7	ug/kg	
206-44-0	Fluoranthene	14.1	9.1	4.7	ug/kg	
86-73-7	Fluorene	ND	9.1	4.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.1	4.7	ug/kg	
91-20-3	Naphthalene	143	13	11	ug/kg	
129-00-0	Pyrene	20.8	9.1	4.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	60%		10-145%
321-60-8	2-Fluorobiphenyl	67%		10-130%
1718-51-0	Terphenyl-d14	85%		22-130%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: MESA F01 CUT1	Date Sampled: 10/08/12
Lab Sample ID: D39633-1	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 92.0
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB17938.D	1	10/10/12	SK	n/a	n/a	GGB982
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	6.19	12	5.8	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	97%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: MESA F01 CUT1	Date Sampled: 10/08/12
Lab Sample ID: D39633-1	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 92.0
Method: SW846-8015B SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD18423.D	1	10/11/12	AV	10/11/12	OP6791	GFD934
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	275	14	9.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	84%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: MESA F01 CUT1 Lab Sample ID: D39633-1 Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 10/08/12 Date Received: 10/09/12 Percent Solids: 92.0
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Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8.0	0.11	mg/kg	5	10/10/12	10/16/12 JB	SW846 6020A ⁴	SW846 3050B ⁶
Barium	1590	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	10/10/12	10/12/12 JM	SW846 6010C ³	SW846 3050B ⁵
Chromium	29.9	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Copper	13.4	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Lead	9.1	5.5	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Mercury	0.12	0.11	mg/kg	1	10/12/12	10/12/12 JB	SW846 7471B ²	SW846 7470A ⁷
Nickel	12.9	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Selenium	< 5.5	5.5	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Silver	< 3.3	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Zinc	65.1	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA2878
- (2) Instrument QC Batch: MA2885
- (3) Instrument QC Batch: MA2887
- (4) Instrument QC Batch: MA2897
- (5) Prep QC Batch: MP8609
- (6) Prep QC Batch: MP8610
- (7) Prep QC Batch: MP8630

RL = Reporting Limit

4.1
4

Report of Analysis

Client Sample ID: MESA F01 CUT1		Date Sampled: 10/08/12
Lab Sample ID: D39633-1		Date Received: 10/09/12
Matrix: SO - Soil		Percent Solids: 92.0
Project: Mesa Energy F-01 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	2160	1.0	umhos/cm	1	10/12/12	JK	SM2510B-1997 MOD
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	10/10/12	KB	SW846 3060A/7196A
Chromium, Trivalent ^a	29.9	2.1	mg/kg	1	10/10/12 20:08	JM	SW846 3060/7196A M
Redox Potential Vs H2	225		mv	1	10/12/12	JD	ASTM D1498-76M
Solids, Percent	92		%	1	10/10/12	SWT	SM19 2540B M
pH	9.58		su	1	10/09/12 15:30	JK	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

4.1
4

Report of Analysis

Client Sample ID: MESA F01 CUT1 Lab Sample ID: D39633-1A Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 10/08/12 Date Received: 10/09/12 Percent Solids: 92.0
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SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	62.9	2.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	22.6	1.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	427	2.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2887

(2) Prep QC Batch: MP8648

RL = Reporting Limit

4.2
4

Report of Analysis

Client Sample ID: MESA F01 CUT1	Date Sampled: 10/08/12
Lab Sample ID: D39633-1A	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 92.0
Project: Mesa Energy F-01 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	11.7		ratio	1	10/12/12 17:03	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

4.2
4

Report of Analysis

Client Sample ID: MESA F01 CUT2	
Lab Sample ID: D39633-2	Date Sampled: 10/08/12
Matrix: SO - Soil	Date Received: 10/09/12
Method: SW846 8260B	Percent Solids: 91.9
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V24114.D	1	10/11/12	BD	n/a	n/a	V5V1467
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.01 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	34.7	59	29	ug/kg	J
108-88-3	Toluene	194	120	59	ug/kg	
100-41-4	Ethylbenzene	38.0	120	22	ug/kg	J
1330-20-7	Xylene (total)	376	230	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	98%		64-130%
460-00-4	4-Bromofluorobenzene	97%		62-131%
17060-07-0	1,2-Dichloroethane-D4	102%		70-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: MESA F01 CUT2	Date Sampled: 10/08/12
Lab Sample ID: D39633-2	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 91.9
Method: SW846 8270C BY SIM SW846 3546	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G11665.D	1	10/12/12	DC	10/12/12	OP6793	E3G549
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	9.1	4.7	ug/kg	
120-12-7	Anthracene	ND	9.1	4.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	9.1	4.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	9.1	4.7	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	9.1	4.7	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	9.1	4.7	ug/kg	
218-01-9	Chrysene	26.7	9.1	4.7	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.1	4.7	ug/kg	
206-44-0	Fluoranthene	12.1	9.1	4.7	ug/kg	
86-73-7	Fluorene	ND	9.1	4.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.1	4.7	ug/kg	
91-20-3	Naphthalene	110	13	11	ug/kg	
129-00-0	Pyrene	18.7	9.1	4.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	60%		10-145%
321-60-8	2-Fluorobiphenyl	65%		10-130%
1718-51-0	Terphenyl-d14	76%		22-130%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: MESA F01 CUT2	Date Sampled: 10/08/12
Lab Sample ID: D39633-2	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 91.9
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB17939.D	1	10/10/12	SK	n/a	n/a	GGB982
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	12	5.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	111%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: MESA F01 CUT2	
Lab Sample ID: D39633-2	Date Sampled: 10/08/12
Matrix: SO - Soil	Date Received: 10/09/12
Method: SW846-8015B SW846 3546	Percent Solids: 91.9
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD18441.D	1	10/11/12	AV	10/11/12	OP6791	GFD934
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	422	15	9.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	116%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: MESA F01 CUT2 Lab Sample ID: D39633-2 Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 10/08/12 Date Received: 10/09/12 Percent Solids: 91.9
--	--

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.1	0.11	mg/kg	5	10/10/12	10/16/12 JB	SW846 6020A ⁴	SW846 3050B ⁶
Barium	1430	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	10/10/12	10/12/12 JM	SW846 6010C ³	SW846 3050B ⁵
Chromium	30.1	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Copper	13.6	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Lead	10.6	5.5	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Mercury	0.18	0.11	mg/kg	1	10/12/12	10/12/12 JB	SW846 7471B ²	SW846 7470A ⁷
Nickel	13.4	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Selenium	< 5.5	5.5	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Silver	< 3.3	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Zinc	58.6	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA2878
- (2) Instrument QC Batch: MA2885
- (3) Instrument QC Batch: MA2887
- (4) Instrument QC Batch: MA2897
- (5) Prep QC Batch: MP8609
- (6) Prep QC Batch: MP8610
- (7) Prep QC Batch: MP8630

RL = Reporting Limit

4.3
4

Report of Analysis

Client Sample ID: MESA F01 CUT2		Date Sampled: 10/08/12
Lab Sample ID: D39633-2		Date Received: 10/09/12
Matrix: SO - Soil		Percent Solids: 91.9
Project: Mesa Energy F-01 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	2400	1.0	umhos/cm	1	10/12/12	JK	SM2510B-1997 MOD
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	10/10/12	KB	SW846 3060A/7196A
Chromium, Trivalent ^a	30.1	2.1	mg/kg	1	10/10/12 20:15	JM	SW846 3060/7196A M
Redox Potential Vs H2	222		mv	1	10/12/12	JD	ASTM D1498-76M
Solids, Percent	91.9		%	1	10/10/12	SWT	SM19 2540B M
pH	9.60		su	1	10/09/12 15:30	JK	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

4.3
4

Report of Analysis

Client Sample ID: MESA F01 CUT2	Date Sampled: 10/08/12
Lab Sample ID: D39633-2A	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 91.9
Project: Mesa Energy F-01 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	67.4	2.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	22.7	1.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	444	2.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2887

(2) Prep QC Batch: MP8648

RL = Reporting Limit

4.4
4

Report of Analysis

Client Sample ID: MESA F01 CUT2		Date Sampled: 10/08/12
Lab Sample ID: D39633-2A		Date Received: 10/09/12
Matrix: SO - Soil		Percent Solids: 91.9
Project: Mesa Energy F-01 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	11.9		ratio	1	10/12/12 17:10	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

4.4
4

Report of Analysis

Client Sample ID: MESA F01 CUT3	Date Sampled: 10/08/12
Lab Sample ID: D39633-3	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 91.8
Method: SW846 8260B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V24115.D	1	10/11/12	BD	n/a	n/a	V5V1467
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.05 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	35.1	58	29	ug/kg	J
108-88-3	Toluene	184	120	58	ug/kg	
100-41-4	Ethylbenzene	34.0	120	22	ug/kg	J
1330-20-7	Xylene (total)	357	230	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	97%		64-130%
460-00-4	4-Bromofluorobenzene	97%		62-131%
17060-07-0	1,2-Dichloroethane-D4	97%		70-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
4

Report of Analysis

Client Sample ID: MESA F01 CUT3		
Lab Sample ID: D39633-3		Date Sampled: 10/08/12
Matrix: SO - Soil		Date Received: 10/09/12
Method: SW846 8270C BY SIM SW846 3546		Percent Solids: 91.8
Project: Mesa Energy F-01 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G11666.D	1	10/12/12	DC	10/12/12	OP6793	E3G549
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	9.0	4.7	ug/kg	
120-12-7	Anthracene	ND	9.0	4.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	9.0	4.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	9.0	4.7	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	9.0	4.7	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	9.0	4.7	ug/kg	
218-01-9	Chrysene	26.7	9.0	4.7	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	9.0	4.7	ug/kg	
206-44-0	Fluoranthene	10.1	9.0	4.7	ug/kg	
86-73-7	Fluorene	33.4	9.0	4.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.0	4.7	ug/kg	
91-20-3	Naphthalene	122	13	11	ug/kg	
129-00-0	Pyrene	18.1	9.0	4.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	74%		10-145%
321-60-8	2-Fluorobiphenyl	78%		10-130%
1718-51-0	Terphenyl-d14	97%		22-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
 4

Report of Analysis

Client Sample ID: MESA F01 CUT3	Date Sampled: 10/08/12
Lab Sample ID: D39633-3	Date Received: 10/09/12
Matrix: SO - Soil	Percent Solids: 91.8
Method: SW846 8015B	
Project: Mesa Energy F-01 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB17940.D	1	10/10/12	SK	n/a	n/a	GGB982
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	12	5.8	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	90%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
4

Report of Analysis

Client Sample ID: MESA F01 CUT3	
Lab Sample ID: D39633-3	Date Sampled: 10/08/12
Matrix: SO - Soil	Date Received: 10/09/12
Method: SW846-8015B SW846 3546	Percent Solids: 91.8
Project: Mesa Energy F-01 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD18443.D	1	10/11/12	AV	10/11/12	OP6791	GFD934
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	169	15	9.4	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	106%		43-136%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
4

Report of Analysis

Client Sample ID: MESA F01 CUT3 Lab Sample ID: D39633-3 Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 10/08/12 Date Received: 10/09/12 Percent Solids: 91.8
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Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.0	0.11	mg/kg	5	10/10/12	10/16/12 JB	SW846 6020A ⁴	SW846 3050B ⁶
Barium	1530	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	10/10/12	10/12/12 JM	SW846 6010C ³	SW846 3050B ⁵
Chromium	31.4	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Copper	13.0	1.1	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Lead	9.7	5.4	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Mercury	< 0.11	0.11	mg/kg	1	10/12/12	10/12/12 JB	SW846 7471B ²	SW846 7470A ⁷
Nickel	14.2	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Selenium	< 5.4	5.4	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Silver	< 3.3	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵
Zinc	58.4	3.3	mg/kg	1	10/10/12	10/10/12 JM	SW846 6010C ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA2878
- (2) Instrument QC Batch: MA2885
- (3) Instrument QC Batch: MA2887
- (4) Instrument QC Batch: MA2897
- (5) Prep QC Batch: MP8609
- (6) Prep QC Batch: MP8610
- (7) Prep QC Batch: MP8630

RL = Reporting Limit

4.5
4

Report of Analysis

Client Sample ID: MESA F01 CUT3 Lab Sample ID: D39633-3 Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 10/08/12 Date Received: 10/09/12 Percent Solids: 91.8
--	--

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	2790	1.0	umhos/cm	1	10/12/12	JK	SM2510B-1997 MOD
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	10/10/12	KB	SW846 3060A/7196A
Chromium, Trivalent ^a	31.4	2.1	mg/kg	1	10/10/12 20:22	JM	SW846 3060/7196A M
Redox Potential Vs H2	19.9		mv	1	10/12/12	JD	ASTM D1498-76M
Solids, Percent	91.8		%	1	10/10/12	SWT	SM19 2540B M
pH	9.54		su	1	10/09/12 15:30	JK	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

4.5
4

Report of Analysis

Client Sample ID: MESA F01 CUT3 Lab Sample ID: D39633-3A Matrix: SO - Soil Project: Mesa Energy F-01 Pit Closure	Date Sampled: 10/08/12 Date Received: 10/09/12 Percent Solids: 91.8
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SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	80.1	2.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Magnesium	31.2	1.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²
Sodium	493	2.0	mg/l	1	10/12/12	10/12/12 JM	SW846 6010C ¹	SW846 3010A/M ²

(1) Instrument QC Batch: MA2887

(2) Prep QC Batch: MP8648

RL = Reporting Limit

4.6
4

Report of Analysis

Client Sample ID: MESA F01 CUT3		Date Sampled: 10/08/12
Lab Sample ID: D39633-3A		Date Received: 10/09/12
Matrix: SO - Soil		Percent Solids: 91.8
Project: Mesa Energy F-01 Pit Closure		

4.6
4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	11.8		ratio	1	10/12/12 17:16	JM	USDA HANDBOOK 60

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D39633

Client: OLSSON

Immediate Client Services Action Required: No

Date / Time Received: 10/9/2012 12:00:00 PM

No. Coolers: 1

Client Service Action Required at Login: No

Project: MESA

Airbill #'s: CO

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smp'l Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	Infrared gun	
3. Cooler media:	Ice (bag)	

<u>Quality Control Preservation</u>	<u>Y or N</u>		<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y or N</u>		<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

5.1
5