REM # 5586

~~#68068~~ Doc#2223071

FORM 27 Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

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

FOR OGCC USE ONLY

OGCC Employee:
☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV
Tracking No:

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☑ Site/Facility Closure ☐ Other (describe):

OGCC Operator Number: 36200
Name of Operator: Grynberg Jack J (Grynberg Petroleum Company)
Address: 3600 S. Yosemite Street, Suite #900
City: Denver State: CO Zip: 80237

Contact Name and Telephone:
W. Gene Webb
No: 303.850.7490
Fax: 303.850.7498

API Number: 05-081-07427 County: Moffat
Facility Name: Hiawatha Deep 4-36 Pit Facility Number: 313388
Well Name: Hiawatha Deep #4-36 Well Number: Hiawatha Deep #4-36
Location: (QtrQtr, Sec, Twp, Rng, Meridian): SWSW, S36, T12N, R101W, 6PM Latitude: 40.95141 Longitude: -108.70364

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): No Impact Present

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☑ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Natural resource extraction and production

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Leswill-Rogrube complex, 1 to 7 percent slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): No permitted water wells within 1.5 mi.; depth to groundwater approx. 800 feet. One dry drainage approx. 3500 ft. northwest and one dry drainage approx. 2000 ft. south.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
☐ Soils	See Attached Notice of Completion Report	Visual observations, field screening and analytical analysis
☐ Vegetation	Remediation # 5586	
☐ Groundwater		
☐ Surface Water		

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
See Attached Notice of Completion Report, Remediation # 5586

Describe how source is to be removed:
See Attached Notice of Completion Report, Remediation # 5586

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
See Attached Notice of Completion Report, Remediation # 5586

Submit Page 2 with Page 1

Grynberg Petroleum

FORM 27 Rev 6/99

Page 2

State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801, Denver, Colorado 80203
(303)894-2100 Fax:(303)894-2109

Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: Hiawatha Deep 4-36 Pits
Facility Name & No: Location ID # 313366

REMEDIATION WORKPLAN (Cont.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

See Attached Notice of Completion Report, Remediation # 5586

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

See Attached Notice of Completion Report, Remediation # 5586

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☑ N If yes, describe:

See Attached Notice of Completion Report, Remediation # 5586

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

See Attached Notice of Completion Report, Remediation # 5586

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 6/6/2011	Date Site Investigation Completed: 6/28/2011	Date Remediation Plan Submitted: 2/24/2011
Remediation Start Date: 3/28/2011	Anticipated Completion Date: Summer 2011	Actual Completion Date: 7/22/2011

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

Print Name: Jack J. Grynberg Signed: _____

Title: President Date: 02/24/2012

OGCC Approved: _____ Title: FOR Alex Fischer Date: 02/15/2013

Supervisor
Western Region

Notice of Completion
Report approved
NFA Required

February 29, 2012

Mr. Alex Fischer, P.G.
Environmental Supervisor
State of Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

RE: Grynberg Petroleum Company
Notice of Completion Report
Hiawatha Deep 4-36 Remediation #5586

Dear Mr. Fischer:

Attached is the Notice of Completion (NOC) Report submitted as a request for a "No Further Action" determination in regards to activity related to drilling pit and flare pit closures at the Grynberg Petroleum Company (Grynberg) facility identified as the Hiawatha Deep 4-36 (API# 05-081-07427). This NOC Report is submitted subsequent to comprehensive and successful completion of tasks outlined in the approved Site Investigation and Remediation Plan (remediation #5586).

Please review the attached report at your convenience and contact me with any questions, concerns, or need for additional information.

Sincerely,
Olsson Associates

Tim Dobransky
Project Scientist

Cc: Gene Webb – Grynberg Petroleum Company
Attachments

TEL 970.263.7800
826 21½ Road, Grand Junction, CO 815505

FAX 970.263.74556
wwww.oaconsulting.com

Hiawatha Deep 4-36
Notice of Completion Report for Remediation #5586

Hiawatha Field
Grynberg Petroleum Company

GRYNBERG PETROLEUM COMPANY
HIAWATHA FIELD

HIAWATHA DEEP 4-36
NOTICE OF COMPLETION REPORT FOR
REMEDIATION #5586

Prepared For:

Grynberg Petroleum Company
3600 S. Yosemite Street
Suite #900
Denver, Colorado 80237

Prepared By:

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

Olsson Project Number 011-0383

Table of Contents

1.0 Introduction 1

1.1 Site Location 1

1.2 Evacuation of Drilling Pit Contents 2

1.3 Drilling Pit Liner Investigation and Integrity Assessment 2

2.0 Drilling Pit Sub-Liner Soil Field Screening 2

3.0 Soil Sampling and Analysis 3

3.1 Drilling Pit 3

3.2 Background and Flare Pit 4

4.0 Soil Sample Analytical Results 5

5.0 Summary and Recommendations 6

List of Tables

Table 1: Drilling Pit Sample Analytical Summary

Table 2: Background Soil Sample Analytical Summary

Table 3: Flare Pit Soil Sample Summary

List of Figures

Figure 1: Site Location Map

Figure 2: Soil Field Screening Locations and Results

Figure 3: Drilling Pit Soil Sample Locations

Figure 4: Background Soil Sample Locations

List of Appendices

Appendix A: COGCC Forms

Appendix B: Photographic Log

Appendix C: Laboratory Analytical Results

1.0 Introduction

Grynberg Petroleum Company (Grynberg) retained Olsson Associates, Incorporated (Olsson) to conduct soil remediation at two pits located at their Hiawatha Deep 4-36 facility (Site).

The drilling pit was lined with a woven synthetic material liner and the flare pit was un-lined. Both were used to contain exploration and production (E&P) waste at the Site. This Notice of Completion (NOC) Report prepared by Olsson on behalf of Grynberg summarizes the soil remediation activities and confirmation soil sampling for the drilling and flare pits located at the Site. Remedial and sampling activities were conducted in accordance with the Site Investigation and Remediation Work Plan submitted to the Colorado Oil and Gas Conservation Commission (COGCC) using Form 27.

Olsson submitted the COGCC Form 27 on behalf of Grynberg via electronic email on February 24, 2011. Preliminary approval to proceed with closure of the subject pit was issued by the COGCC and obtained by Grynberg on March 2, 2011; at which time the Remediation Number #5586 was issued.

Pit content removal and sub-liner investigation activities began on March 28, 2011 and were completed on June 28, 2011. Soil backfilling and surface soil grading operations began on July 6, 2011 and were completed on July 22, 2011.

During a site inspection by the COGCC Area Field Inspector on April 5, 2011 a compromise in the drilling pit liner below fluid level was documented. As specified in COGCC Rule 905.c a Spill/Release Report (Form 19) was prepared and submitted on April 13, 2011 *(Spill/Release tracking number 2213272)*.

As neither the drilling pit nor the flare pit was originally permitted through the COGCC, a Form 15 Pit Report for each facility is included in Appendix A.

Photographic documentation of site activities is included as Appendix B.

1.1 Site Location

The Site is located in a sparsely vegetated rural portion of Moffat County, Colorado in the southwest quarter of the southwest quarter (SWSW) of Section 36, Township 12 North, Range 101 West of the Sixth Prime Meridian. According to the COGGC database website, the Site planned location is latitude 40.95141, longitude -108.70364. A Site Location Map is included as Figure 1.

1.2 Evacuation of Drilling Pit Contents

Drilling pit contents removal was initiated on March 28, 2011 and continued until June 6, 2011. Fluids and liquid drilling mud were water jetted, mixed using a 6-inch trash pump and excavator then pumped into tankers for transportation to the Calpet disposal facility located in Evanston, Wyoming (a Wyoming Department of Environmental Quality permitted disposal facility).

The remaining drill cuttings and drilling mud was mixed with clean imported soil at an approximate one to one mix ratio in order to facilitate removal for disposal. In addition, the impacted berm soil noted by the COGCC Area Field Inspector on April 5, 2011 was removed for disposal. The drill cuttings, drilling mud, and excavated impacted soil were transported for disposal to the Rock Springs Landfill located in Rock Springs, Wyoming.

Transport records (e.g. haul tickets) have been retained by Grynberg and are available for review upon request.

1.3 Drilling Pit Liner Investigation and Integrity Assessment

The woven drilling pit liner was observed to be in poor condition during a site inspection by the COGCC Area Field Inspector on April 5, 2011. Numerous holes and tears were noted throughout the liner, especially on the northern and southern side walls. The liner was removed during the pit solids mixing and removal process, as a result liner condition below cuttings and drilling mud was not conducted. Remaining pieces of liner material were removed by hand prior to backfilling drilling pit.

2.0 Drilling Pit Sub-Liner Soil Field Screening

Drilling Pit Bottom

The sub-liner investigation began on June 6, 2011 and was completed on June 8, 2011. A total of 31 test pits were excavated to a depth of 3 to 4 feet below the bottom of the main pit (approximately 13 to 14 feet below surrounding grade). The approximate location of the test pits are indicated on Figure 2. The soil underlying the main pit was observed to be slightly moist weathered shale with abundant gypsum crystal deposits indicative of undisturbed native soil. Hydrocarbon staining was not noted during initial visual observations. Representative soil samples from each test pit were field screened using a photoionization detector (PID) and at one-foot intervals for potential subsurface hydrocarbon impact. Soil field screening consists of placing a representative soil sample into Ziploc® bags, resealing the bags, and allowing the bag contents to equilibrate to the surrounding ambient conditions. The sample intake nozzle of a PID was introduced into the individual sample bags to measure the volatile organic vapors of the air in the bag head space. Field soil screening PID measurements, expressed in parts per million (ppm), are presented on Figure 2 and ranged from less than 1 ppm to approximately 3.9 ppm in test pit TP-8 at 1 foot below the base of the drilling pit .

Drilling Pit Sidewalls

Hydrocarbon staining was not noted during initial visual observations at the drilling pit sidewalls. Eighteen sidewall locations were field screened with a PID for potential subsurface hydrocarbon impact. The field soil screening locations were located approximately in the middle of the north, south, east, and west pit sidewalls. Sidewall field soil screening PID measurements were generally less than 1 ppm as indicated on Figure 2.

Drilling Pit Center Berm Divider

Hydrocarbon staining was not noted during initial visual observations at the center berm divider. Two locations, midway to the pit bottom were field screened with a PID for potential hydrocarbon impact. Soil field screening PID measurements were generally less than 1 ppm as indicated on Figure 2.

3.0 Soil Sampling and Analysis

Soil samples for analysis were placed in laboratory-supplied containers, labeled, and place in an ice-filled cooler for overnight delivery under chain-of-custody protocol to Accutest Laboratories of Wheat Ridge, Colorado.

3.1 Drilling Pit

To assess whether all E&P waste had been removed from the drilling pit, fifteen soil samples were collected and submitted for laboratory analyses that included:

- Total petroleum hydrocarbons (TPH) in the gasoline and diesel range organic ranges using Environmental Protection Agency (EPA) Method 8015B;
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EP Method 8260B;
- Metals – including total Resource Conservation and Recovery Act (RCRA) metals (arsenic, barium, cadmium, chromium, selenium, lead, silver, and mercury), copper, nickel, and zinc using EPA Methods 6020 (arsenic only), 6020B, and 7471A (mercury only);
- Poly-nuclear, aromatic hydrocarbons (PAHs) using EPA Method 8270C by Single Ion Monitoring (SIM) method;
- Hexavalent and trivalent chromium (EPA Method 7196A);
- Redox Potential using American Society for Testing and Materials (ASTM) Method D1498-76M;
- Percent Solids using Standard Method (SM)2540B M;
- Electrical Conductivity (EC) using Method Department of Agriculture Book N9
- pH using EPA Method 9045C;

- Sodium absorption ratio (SAR) metal analysis (calcium, magnesium, and sodium) using EPA Method 200.7; and
- SAR using United States Department of Agriculture (USDA) Handbook 60

Drilling Pit Bottom

A total of ten grab soil samples were collected for laboratory analysis from the drilling pit surface to one-foot interval below the base of the pit as indicated on Figure 3. Two of the grab soil samples submitted for laboratory analyses were collected from the east and west portions of the drilling pit and exhibited the highest observed test pit PID field screening measurements, Deep 4-36 TP-8 (2.5 ppm) and Deep 4-36 TP-24 (3.9 ppm), respectively.

Drilling Pit Sidewalls and Berm

Four grab soil samples were collected from the drilling pit sidewalls (one each from north, south, east, and west). Additionally one grab soil sample was collected from the center berm divider to verify the field screening results and further confirm that no impact was present. These samples were analyzed for COGCC Rule 910 and Table 910-1 compliance. Soil sample locations are depicted on Figure 3. Please see Table 1 for confirmation sample results.

3.2 Background and Flare Pit

Background

Five grab soil samples were collected for laboratory analysis from undisturbed ground surrounding the Site. One of these samples (BG-1) was analyzed for COGCC Table 910-1 (with the exception of TPH, BTEX and PAHs) and included EC, SAR, and pH, and metals while the remaining four background soil samples were analyzed for arsenic only. In addition, three grab soil samples were collected from a depth range of approximately 10.5 feet to 13 feet below ground surface surrounding the Site to compare with soil conditions found in the bottom of the drilling pit and analyzed for arsenic. Please refer to Figure 4-Background Sample Locations.

Flare Pit

The flare pit, located adjacent to the southwest corner of the drilling pit was initially backfilled to allow for safer and easier access during the removal of drilling pit contents. A pothole was excavated to a depth of 9 to 10 feet below ground surface within the flare pit. One grab soil sample was collected from the excavator bucket. This sample was analyzed for COGCC Rule 910 and Table 910-1 compliance. Please see Table 3 for flare pit sample results.

4.0 Soil Sample Analytical Results

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 C. As indicated on the laboratory reports, all soil samples arrived in good condition, within the appropriate temperature range, and analyzed within recommended holding time.

Attached Table 1 summarizes the drilling pit soil sample analytical data. Table 2 summarized the background soil sample analytical data. The flare pit soil sample analytical data is summarized in Table 3.

Drilling Pit

- Laboratory analysis reported TPH either below laboratory reporting limits or below the COGCC Table 901-1 maximum TPH concentration for soil of 500 milligrams per kilogram (mg/kg);
- BTEX concentrations were reported either below laboratory reporting limits of below their respective COGCC Table 910-1 concentration;
- Arsenic concentrations were reported ranging from 10.8 mg/kg (soil sample Deep 4-36 ESW) to 56.0 mg/kg (soil sample Deep 4-36 TP-3). The reported soil arsenic concentration are above the COGCC 910-1 concentration for arsenic of 0.039 mg/kg but within the arsenic concentration ranges reported for the background soil samples of 17.3 mg/kg (soil sample BG2 0-6") and 87.7 mg/kg (soil sample Deep 4-36 BG8 10'-10.5). The remaining metals concentrations were reported either below laboratory reporting limits or below their respective COGCC Table 910-1 concentrations.
- Laboratory analysis reported SAR in the submitted soil samples below the maximum COGCC Table 910-1 value for SAR of less than 12;
- PAHs in the soil samples were reported either below laboratory reporting limits or below their respective COGCC Table 910-1 concentrations;
- EC was reported above the COGCC 910-1 regulatory guidance value of less than 4 or two times background in soil samples Deep 4-36 TP-8 at 4.26 millimhos per centimeter (mmhos/cm), Deep 4-36 TP-17 (5.04 mmhos/cm), Deep 4-36 TP-31 (4.78 mmhos/cm), Deep 4-36 ESW (5.73 mmhos/cm), Deep 4-36 NSW (6.51 mmhos/cm), Deep 4-36 SSW (6.29 mmhos/cm), Deep 4-36 WSW (7.21 mmhos/cm), and Deep 4-36 CBD (5.72 mmhos/cm). Laboratory analysis reported EC in the remaining seven soil samples below the COGCC 910-1 value.
- pH was reported above the COGCC 910-1 values of 6 to 9 in soil sample Deep 4-36 TP-15 at 9.09; and
- Redox potential vs. H_2 (Redox) was reported between 468 millivolts (mv) and 503 mv. Percent solids were reported between 79.8 percent and 84.1 percent. There are no associated COGCC Table 910-1 values for Redox or percent solids.

Background Soil Samples

- Arsenic was reported above the COGCC Table 910-1 value of 0.39 mg/kg in all eight soil samples ranging from 17.2 mg/kg to (soil sample BG1) to 87.7 mg.kg (soil sample Deep 4-36 BG6);
- Remaining metals in background soil sample BG1 were either below their respective COGCC regulatory concentrations or below laboratory reporting limits;
- Report values for SAR (2.93) and EC (0.865 mmhos/cm) were within COGCC Table 910-1 limits while pH (9.12) was above the COGCC Table 910-1 pH value of 9; and
- Redox and percent solids were reported at 445 mv and 91.4 percent, respectively.

Flare Pit Soil Sample

- Laboratory analysis reported TPH either below laboratory reporting limits or below the COGCC Table 901-1 maximum TPH concentration for soil of 500 mg/kg;
- BTEX concentrations were reported either below laboratory reporting limits of below their respective COGCC Table 910-1 concentrations;
- Arsenic was reported at 18.6 mg/kg, above the COGCC 910-1 maximum concentration of 0.039 mg/kg, but within the arsenic concentration ranges reported for the background soil samples. The remaining metals concentrations were reported either below laboratory reporting limits or below their respective COGCC Table 910-1 concentrations;
- Laboratory analysis reported SAR at 3.2, below the maximum CPGCC Table 910-1 value for SAR of less than 12;
- PAHs in the soil samples were reported below laboratory reporting limits;
- EC was reported at 2.32 mmhos/cm, above the COGCC Table 910-1 value of less than two times background;
- pH was reported at 8.47, below the COGCC Table 910-1 values of 6 to 9; and
- Redox and percent solids were reported at 469 mv and 73.2 percent, respectively, and do not have an associated COGCC Table 910-1 value.

5.0 Summary and Recommendations

Laboratory analysis of soil samples collected from the drilling and flare pits reported TPH, BTEX, PAHs, SAR are either below the COGCC Table 910-1 levels or laboratory reporting limits.

Arsenic concentrations in all fifteen of the drilling pit soil samples (but are below the background soil arsenic concentrations). Concentrations of remaining metals were either below laboratory reporting limits or below their respective COGCC Table 910-1 levels.

Electrical conductivity in eight of the drilling pit samples and pH in one of the drilling pit samples were above COGCC Table 910-1 levels. A Sundry Notice requesting COGCC consideration of background arsenic concentrations, elevated electrical conductivity, and pH levels in deeper soils should not adversely affect the successful reclamation of the Site as these soils are not within three feet of the ground surface is included in Appendix A.

Based on the data presented herein, Olsson recommends that Grynberg respectfully request COGCC grant a No Further Action Determination regarding the closure of the drilling and flare pits at the Site.

Table 1
Hiawatha Deep 4-36 Drilling Pit
Soil Analytical Summary

SAMPLE SUMMARY	
Location Description	Hiawatha Deep 4-36
Sample Type	Soil

LABORATORY DATA SUMMARY																		
Sample ID	DEEP 4-36 TP-1	DEEP 4-36 TP-3	DEEP 4-36 TP-8	DEEP 4-36 TP-13	DEEP 4-36 TP-15	DEEP 4-36 TP-17	DEEP 4-36 TP-19	DEEP 4-36 TP-24	DEEP 4-36 TP-29	DEEP 4-36 TP-31	DEEP 4-36 ESW	DEEP 4-36 NSW	DEEP 4-36 SSW	DEEP 4-36 WSW	DEEP 4-36 CBD		
Depth	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-6"	0-6"	0-6"	0-6"	0-6"		
Sample Date	6/6/2011	6/6/2011	6/6/2011	6/7/2011	6/7/2011	6/7/2011	6/7/2011	6/7/2011	6/8/2011	6/8/2011	6/7/2011	6/7/2011	6/7/2011	6/7/2011	6/7/2011	**COGCC TABLE 910-1 CONCENTRATIONS**	**UNITS**
Analytical Parameters																	
TPH																	
TPH Gasoline Range Organics	<7.3	<7.4	<6.8	<7.0	<7.3	<7.0	<7.2	<6.9	<7.1	<7.1	<6.9	<7.4	<7.2	<7.5	<7.4	500	mg/kg
TPH Diesel Range Organics	<11	<11	<10	<10	<11	<10	<11	<10	<11	<11	10.9 J	106	<11	<11	<11		
BTEX																	
Benzene	<0.032	<0.033	<0.030	<0.031	<0.032	<0.031	<0.032	<0.030	<0.031	<0.031	<0.031	<0.033	<0.032	<0.033	<0.032	0.17	mg/kg
Toluene	<0.073	<0.074	<0.068	<0.070	<0.073	<0.070	<0.072	<0.069	<0.071	<0.071	<0.069	<0.074	<0.072	<0.075	<0.074	85	mg/kg
Ethylbenzene	<0.037	<0.037	<0.034	<0.035	<0.036	<0.035	<0.036	<0.034	<0.036	<0.035	<0.035	<0.037	<0.036	<0.037	<0.037	100	mg/kg
Xylene (total)	<0.15	<0.15	<0.14	<0.14	<0.15	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.15	<0.14	<0.15	<0.15	175	mg/kg
Metals																	
Arsenic	19.1	56.0	25.7	9.3	24.6	29.3	46.9	31.2	46.1	46.2	10.8	15.4	27.9	13.5	20.8	0.39	mg/kg
Barium	50.6	54.2	84.4	64.7	72.6	66.0	65.0	95.7	58.6	72.6	60.2	133	64.0	73.0	86.9	15,000	mg/kg
Cadmium	<1.2	<1.2	<1.2	<1.2	<1.2	<1.1	<1.1	<1.2	<1.1	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	70	mg/kg
Chromium	10.9	11.7	11.7	9.1	12.2	11.3	12.6	12.1	12.0	11.9	7.8	10.3	8.3	9.7	10.7	NA	mg/kg
Chromium, Hexavalent	0.85	0.98	0.93	0.80	<0.49	0.61	0.91	0.90	0.92	<0.48	0.79	1.2	1.2	1.1	0.78	23	mg/kg
Chromium, Trivalent	10.1	10.7	10.8	8.3	11.8	10.7	11.7	11.2	11.1	11.6	7.0	9.1	7.1	8.6	9.9	120,000	mg/kg
Copper	23.4	23.5	26.7	20.7	22.2	24.0	23.6	21.7	23.6	20.5	18.2	15.6	14.7	15.0	20.0	3,100	mg/kg
Lead	16.2	16.8	18.9	12.0	18.1	19.6	16.1	18.9	17.9	17.2	13.1	13.0	16.3	11.9	14.6	400	mg/kg
Mercury	<0.11	<0.11	<0.12	<0.10	<.10	<0.11	<0.12	<0.10	<0.11	<0.11	<0.11	<0.12	<0.12	<0.12	<0.11	23	mg/kg
Nickel	16.1	21.5	20.3	17.3	20.4	21.1	18.2	20.9	20.7	18.6	11.6	13.6	15.7	14.5	17.4	1,600	mg/kg
Selenium	<6.1	<6.2	<5.9	<6.0	<5.8	<5.7	<5.7	<5.8	<5.6	<5.9	<5.9	<6.2	<6.1	<6.2	<5.8	390	mg/kg
Silver	<3.6	<3.7	<3.5	<3.6	<3.5	<3.4	<3.4	<3.5	<3.4	<3.5	<3.5	<3.7	<3.7	<3.7	<3.5	390	mg/kg
Zinc	65.8	73.1	76.9	54.3	86.2	96.8	70.7	86.8	69.9	71.1	69.1	63.3	63.0	58.1	64.6	23,000	mg/kg
SAR Metals Analysis																	
Calcium	225	315	335	317	283	237	423	95.9	305	326	359	518	529	477	345	NA	mg/L
Magnesium	129	176	200	185	189	173	306	86.0	155	215	243	130	108	227	188	NA	mg/L
Sodium	302	499	628	438	425	369	490	274	445	672	799	953	903	1060	801	NA	mg/L
Sodium Adsorption Ratio	3.97	5.59	6.71	4.84	4.80	4.45	4.43	4.90	5.18	7.09	7.98	9.69	9.34	10.0	8.62	<12	ratio
Polynuclear Aromatic Hyrdrocarbons																	
Acenaphthene	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.0154 J	<0.013	<0.013	<0.013	<0.013	1,000	mg/kg
Anthracene	<0.015	<0.015	<0.014	<0.014	<0.015	<0.014	<0.015	<0.014	<0.015	<0.015	<0.014	<0.015	<0.015	<0.015	<0.015	1,000	mg/kg
Benzo(a)anthracene	<0.021	<0.022	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.022	<0.022	0.22	mg/kg
Benzo(a)pyrene	<0.030	<0.030	<0.029	<0.029	<0.029	<0.029	<0.029	<0.028	<0.029	<0.029	<0.029	<0.030	<0.030	<0.030	<0.030	0.022	mg/kg
Benzo(b)fluoranthene	<0.030	<0.031	<0.029	<0.030	<0.030	<0.030	<0.030	<0.029	<0.030	<0.030	<0.030	<0.031	<0.030	<0.031	<0.031	0.22	mg/kg
Benzo(k)fluoranthene	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	2.2	mg/kg
Chrysene	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018	<0.017	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	22	mg/kg
Dibenzo(a,h)anthracene	<0.030	<0.031	<0.029	<0.030	<0.030	<0.030	<0.030	<0.029	<0.030	<0.030	<0.030	<0.031	<0.030	<0.031	<0.031	0.022	mg/kg
Fluoranthene	<0.016	<0.017	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.0162	<0.017	<0.016	<0.017	<0.017	1,000	mg/kg
Fluorene	<0.014	<0.014	<0.014	<0.014	<0.017	<0.014	<0.014	<0.013	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	1,000	mg/kg
Indeno(1,2,3-cd)pyrene	<0.045	<0.046	<0.044	<0.044	<0.045	<0.044	<0.045	<0.044	<0.044	<0.045	<0.044	<0.045	<0.045	<0.046	<0.046	0.22	mg/kg
Napthalene	<0.016	<0.016	<0.015	<0.015	<0.016	<0.015	<0.015	<0.015	<0.015	<0.015	0.0397	<0.016	<0.016	<0.016	<0.016	23	mg/kg
Pyrene	<0.016	<0.016	<0.015	<0.015	<0.016	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.016	<0.016	<0.016	<0.016	1,000	mg/kg
General Chemistry																	
Redox Potential Vs H2	484	486	468	467	477	496	487	482	495	467	488	503	494	497	488	NA	mv
Solids, Percent	80.9	80.3	83.9	82.8	81.4	83.1	82.1	84.1	82.3	82.1	83.3	80.4	80.9	79.8	80.1	NA	%
Electrical Conductivity	2.59	3.72	4.26	3.44	3.52	3.36	5.04	2.09	3.77	4.78	5.73	6.51	6.29	7.21	5.72	<4 or 2 x the background	mmhos/cm
pH	8.71	8.61	8.70	8.56	9.09	8.76	8.30	8.36	8.32	8.34	8.27	7.83	8.01	7.88	8.08	6-9	su

ND - Not detected
mg/kg - milligrams per kilogram
J - indicates an estimated value
NT - parameter was not tested
mmhos/cm - millimhos per centimeter
mv - millivolts
su - standard units
NA - not applicable

Over allowable limit but under BACKGROUND level.
Over allowable limit and not within BACKGROUND level.
Over allowable limit

Table 2
Hiawatha Deep 4-36 Background
Soil Analytical Summary

SAMPLE SUMMARY	
Location Description	Hiawatha Deep 4-36
Sample Type	Soil

LABORATORY DATA SUMMARY										
Sample ID	BG1	BG2	BG3	BG4	BG5	DEEP 4-36 BG6	DEEP 4-36 BG7	DEEP 4-36 BG8		
Depth	0-6"	0"-6"	0-6"	0"-6"	0"-6"	10'-10.5'	11.5'-12.5'	12'-13'		
Sample Date	6/8/2011	6/8/2011	6/8/2011	6/8/2011	6/6/2011	6/28/2011	6/28/2011	6/28/2011	**COGCC TABLE 910-1 CONCENTRATIONS**	**UNITS**
Analytical Parameters										
Metals										
Arsenic	17.2	17.3	19.8	17.9	17.9	87.7	41.3	18.6	0.39	mg/kg
Barium	158	-	-	-	-	-	-	-	15,000	mg/kg
Cadmium	<1.1	-	-	-	-	-	-	-	70	mg/kg
Chromium	10.0	-	-	-	-	-	-	-	NA	mg/kg
Chromium, Hexavalent	0.50	-	-	-	-	-	-	-	23	mg/kg
Chromium, Trivalent	9.5	-	-	-	-	-	-	-	120,000	mg/kg
Copper	11.4	-	-	-	-	-	-	-	3,100	mg/kg
Lead	11.0	-	-	-	-	-	-	-	400	mg/kg
Mercury	<0.10	-	-	-	-	-	-	-	23	mg/kg
Nickel	11.2	-	-	-	-	-	-	-	1,600	mg/kg
Selenium	<5.4	-	-	-	-	-	-	-	390	mg/kg
Silver	<3.2	-	-	-	-	-	-	-	390	mg/kg
Zinc	39.9	-	-	-	-	-	-	-	23,000	mg/kg
SAR Metals Analysis										
Calcium	54.9	-	-	-	-	-	-	-	NA	mg/L
Magnesium	23.4	-	-	-	-	-	-	-	NA	mg/L
Sodium	103	-	-	-	-	-	-	-	NA	mg/L
Sodium Adsorption Ratio	2.93	-	-	-	-	-	-	-	<12	ratio
General Chemistry										
Redox Potential Vs H2	445	-	-	-	-	-	-	-	NA	mv
Solids, Percent	91.4	92.3	84.7	89.8	90.1	77.8	78.4	78.4	NA	%
Electrical Conductivity	0.865	-	-	-	-	-	-	-	<4 or 2 x the background	mmhos/cm
pH	9.12	-	-	-	-	-	-	-	6-9	su

mg/kg - milligrams per kilogram
NT - parameter was not tested
mmhos/cm - millimhos per centimeter
mv - millivolts
su - standard units
NA - not applicable
mg-L - milligrams per liter

Table 3
Hiawatha Deep 4-36 Flare Pit
Soil Analytical Summary

SAMPLE SUMMARY	
Location Description	Hiawatha Deep 4-36 Flare Pit
Sample Type	Soil

LABORATORY DATA SUMMARY			
Sample ID	DEEP 4-36 FP		
Depth	9'-10'		
Sample Date	5/25/2011	**COGCC TABLE 910-1**	
Analytical Parameters		**CONCENTRATIONS**	**UNITS**
TPH			
TPH Gasoline Range Organics	14.6 J	500	mg/kg
TPH Diesel Range Organics	<12		
BTEX			
Benzene	<0.037	0.17	mg/kg
Toluene	<0.085	85	mg/kg
Ethylbenzene	<0.042	100	mg/kg
Xylene (total)	0.107 J	175	mg/kg
Metals			
Arsenic	18.6	0.39	mg/kg
Barium	133	15,000	mg/kg
Cadmium	<1.3	70	mg/kg
Chromium	13.8	NA	mg/kg
Chromium, Hexavalent	<0.54	23	mg/kg
Chromium, Trivalent	13.3	120,000	mg/kg
Copper	17.3	3,100	mg/kg
Lead	12.5	400	mg/kg
Mercury	<0.12	23	mg/kg
Nickel	15.5	1,600	mg/kg
Selenium	<6.3	390	mg/kg
Silver	<3.8	390	mg/kg
Zinc	56.1	23,000	mg/kg
SAR Metals Analysis			
Calcium	234	NA	mg/L
Magnesium	77.6	NA	mg/L
Sodium	221	NA	mg/L
Sodium Adsorption Ratio	3.2	<12	ratio
Polynuclear Aromatic Hyrdrocarbons			
Acenaphthene	<0.0073	1,000	mg/kg
Anthracene	<0.0082	1,000	mg/kg
Benzo(a)anthracene	<0.012	0.22	mg/kg
Benzo(a)pyrene	<0.016	0.022	mg/kg
Benzo(b)fluoranthene	<0.017	0.22	mg/kg
Benzo(k)fluoranthene	<0.010	2.2	mg/kg
Chrysene	<0.010	22	mg/kg
Dibenzo(a,h)anthracene	<0.017	0.022	mg/kg
Fluoranthene	<0.0091	1,000	mg/kg
Fluorene	<0.0077	1,000	mg/kg
Indeno(1,2,3-cd)pyrene	<0.025	0.22	mg/kg
Napthalene	<0.0087	23	mg/kg
Pyrene	<0.0087	1,000	mg/kg
General Chemistry			
Redox Potential Vs H2	469	NA	mv
Solids, Percent	73.2	NA	%
Electrical Conductivity	2.32	<4 or 2 x the background	mmhos/cm
pH	8.47	6-9	su

ND - Not detected
mg/kg - milligrams per kilogram
J - indicates an estimated value
NT - parameter was not tested
mmhos/cm - millimhos per centimeter
mv - millivolts
su - standard units
NA - not applicable

Over allowable limit but under BACKGROUND level.
Over allowable limit and not within BACKGROUND level.
Over allowable limit

Sections NAD83

Hiawatha Deep 4-36

0 0.125 0.25 0.5 Miles

1 inch = 1,034 feet

N W E S

SWSW S36 T12W R101W

PROJECT NO:	011-0383
DRAWN BY:	KJG
DATE:	02/15/2012

SITE LOCATION
HIAWATHA DEEP 4-36
GRYNBERG PETROLEUM
MOFFAT COUNTY, CO

OLSSON ASSOCIATES

826 21-1/2 ROAD
GRAND JUNCTION,
CO 81505
TEL 970.263.7800
FAX 970.263.7456

FIGURE

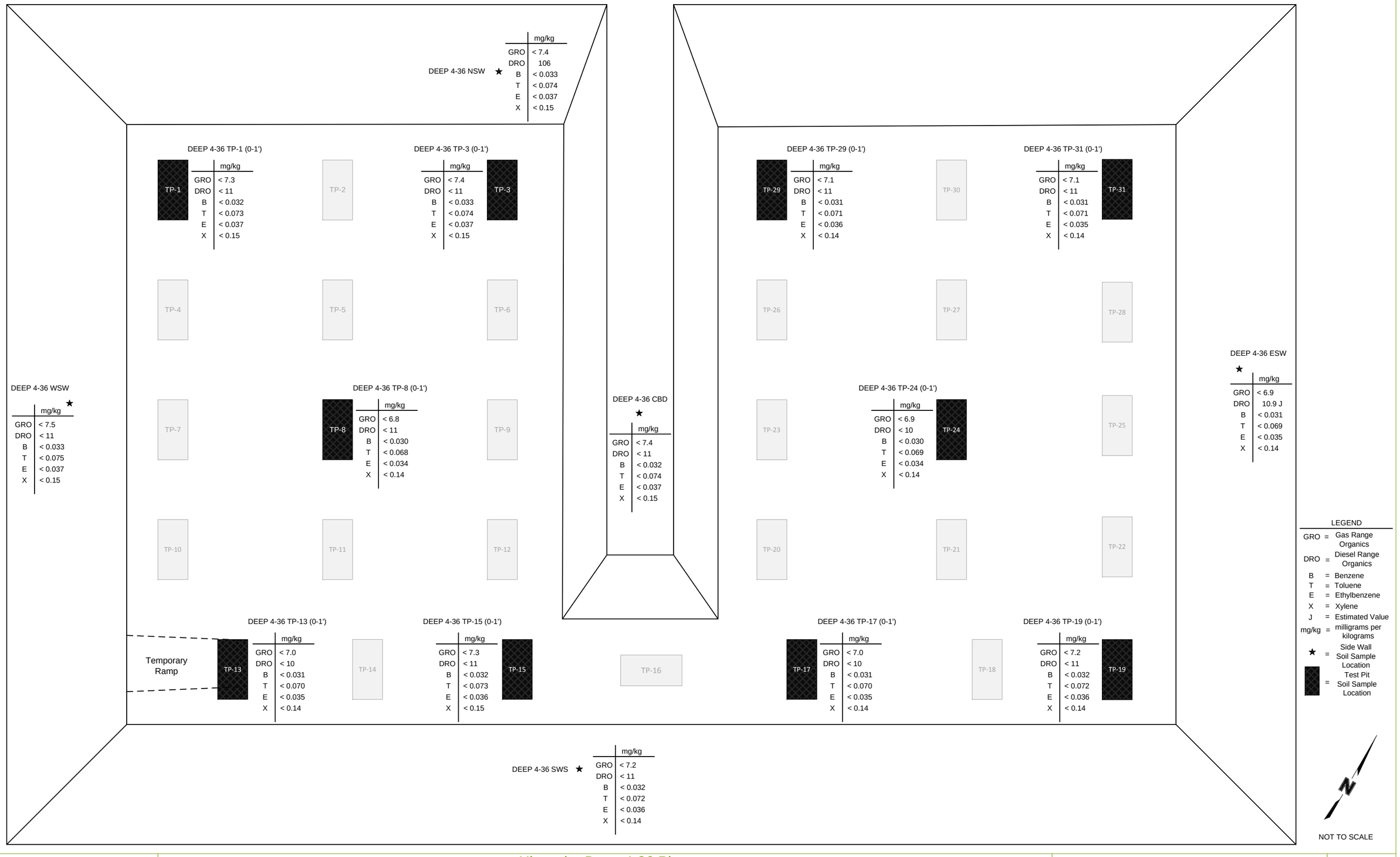
1

PROJECT NO:	011-0383
DRAWN BY:	Brian Swedhin
DATE:	6/27/2011

Hiawatha Deep 4-36 Pit
Soil Field Screening Results
Grynberg Petroleum

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

FIGURE 2



PROJECT NO: 011-0383
DRAWN BY: Brian Swedhin
DATE: 6/27/2011

Hiawatha Deep 4-36 Pit
Soil Sample Location
Grynberg Petroleum

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

FIGURE
3

Sample Location
Hiwatha State 1A
Hiawatha Deep 4-36

0 0.025 0.05 0.1 Miles

1 inch = 184 feet

N
W E
S

SWSW S36 T12W R101W

PROJECT NO:	011-0383
DRAWN BY:	KJG
DATE:	02/15/2012

BACKGROUND SAMPLE LOCATION
HIAWATHA DEEP 4-36
GRYNBERG PETROLEUM
MOFFAT COUNTY, CO

OLSSON ASSOCIATES
826 21-1/2 ROAD
GRAND JUNCTION,
CO 81505
TEL 970.263.7800
FAX 970.263.7456

FIGURE

4

FORM
27
Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

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

FOR OGCC USE ONLY

OGCC Employee:
☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV
Tracking No:

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☑ Site/Facility Closure ☐ Other (describe):

OGCC Operator Number: 36200
Name of Operator: Grynberg Jack J (Grynberg Petroleum Company)
Address: 3600 S. Yosemite Street, Suite #900
City: Denver State: CO Zip: 80237

Contact Name and Telephone:
W. Gene Webb
No: 303.850.7490
Fax: 303.850.7498

API Number: 05-081-07427
County: Moffat
Facility Name: Hiawatha Deep 4-36 Pit
Facility Number: 313388
Well Name: Hiawatha Deep #4-36
Well Number: Hiawatha Deep #4-36
Location: (QtrQtr, Sec, Twp, Rng, Meridian): SWSW, S36, T12N, R101W, 6PM
Latitude: 40.95141 Longitude: -108.70364

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): No Impact Present

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☑ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Natural resource extraction and production

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Leswill-Rogrube complex, 1 to 7 percent slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): No permitted water wells within 1.5 mi.; depth to groundwater approx. 800 feet. One dry drainage approx. 3500 ft. northwest and one dry drainage approx. 2000 ft. south.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
☐ Soils	See Attached Notice of Completion Report	Visual observations, field screening and analytical analysisi
☐ Vegetation	Remediation # 5586	
☐ Groundwater		
☐ Surface Water		

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

See Attached Notice of Completion Report, Remediation # 5586

Describe how source is to be removed:

See Attached Notice of Completion Report, Remediation # 5586

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

See Attached Notice of Completion Report, Remediation # 5586

Submit Page 2 with Page 1

FORM 27 Rev 6/99

Page 2

State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801, Denver, Colorado 80203
(303)894-2100 Fax:(303)894-2109

Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

REMEDIATION WORKPLAN (Cont.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

See Attached Notice of Completion Report, Remediation # 5586

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

See Attached Notice of Completion Report, Remediation # 5586

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☑ N If yes, describe:

See Attached Notice of Completion Report, Remediation # 5586

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

See Attached Notice of Completion Report, Remediation # 5586

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 6/6/2011	Date Site Investigation Completed: 6/28/2011	Date Remediation Plan Submitted: 2/24/2011
Remediation Start Date: 3/28/2011	Anticipated Completion Date: Summer 2011	Actual Completion Date: 7/22/2011

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

Print Name: Jack J. Grynberg Signed: _____

Title: President Date: 02/24/2012

OGCC Approved: _____ Title: _____ Date: _____

FORM 15
Rev 10/11

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80205 Phone: (303) 894-2100 Fax: (303) 894-2109

OGCC RECEPTION

Document Number:

EARTHEN PIT REPORT / PERMIT

This form is to be used for both reporting and permitting pits. Rule 903 describes when a Permit with prior approval, or a Report within 30 days is required for pits. Submit required attachments and forms.

Form Type: ☑ PERMIT ☐ REPORT OGCC PIT NUMBER: _____

NOTE: Operator to provide OGCC Pit Number only if available on an existing pit for pit report

ATTACHMENTS

Detailed Site Plan	
Design/Cross Sec	
Topo Map	
Calculations	
Sensitive Area Info	
Mud Program	
Form 2A	
Form 26	
Water Analysis	

OGCC Operator Number: 36,200 Contact Name: W. Gene Webb

Name of Operator: Grynberg Jack J (Grynberg Petroleum Company)

Address: 3600 S. Yosemite Street, Suite #900 Phone: (303) 850-7490

City: Denver State: CO Zip: 80237 Email: g.webb@grynberg.com

Pit Location Information

Operator's Pit/Facility Name: Hiawatha Deep 4-36 Operator's Pit/Facility Number: HIAWATHA DEEP-612N101W 36SWSW

API Number (associated well): 05- 081 7427 ____

OGCC Location ID (associated location): 313388 Or Form 2A # _____

Pit Location (QtrQtr, Sec, Twp, Rng, Meridian): SWSW-S36 -12N-101W- 6th

Latitude: 40.951410 Longitude: -108.703640 County: Moffat

Operation Information

Pit Use/Type (Check all that apply): Pit Type: ☑ Lined ☐ Unlined

☑ Drilling: (Ancillary, Completion, Flowback, Reserve Pits) ☐ Oil-based Mud; ☐ Salt Sections or High Chloride Mud

☐ Production: ☐ Skimming/Settling; ☐ Produced Water Storage; ☐ Percolation; ☐ Evaporation

☐ Special Purpose: ☐ Flare; ☐ Emergency; ☐ Blowdown; ☐ Workover; ☐ Plugging; ☐ BS&W/Tank Bottoms

☐ Multi-Well Pit: Construction Date: _____ Actual or Planned: _____

Method of treatment prior to discharge into pit: _____

Offsite disposal of pit contents: ☐ Injection; ☐ Commercial; ☐ Reuse/Recycle; ☐ NPDES; Permit Number: _____

Other Information:

Site Conditions

Distance (in feet) to the nearest surface water: 3,500 Ground Water (depth): 800 Water Well: 7,920

Is this location in a Sensitive Area? No Existing Location? No

Pit Design and Construction

Size of Pit (in feet): Length: 175 Width: 115 Depth: 10 Calc. Volume (barrels): _____

Flow Rates (in bbl/day): Inflow: _____ Outflow: _____ Evaporation: _____ Percolation: _____

Primary Liner. Type: Woven Poly Thickness (mil): _____

Seconday Liner (if present): Type: _____ Thickness (mil): _____

Is Pit Fenced? Yes Is Pit Netted? No Leak Detection? No

Other Information:

Operator Comments:

Certification

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

Signed: _____ Print Name: Jack J. Grynberg

Title: President Email: grynpetro@grynberg.com Date: 02/24/2012

Approval

Signed: _____ Title: _____ Date: _____

BMP

Type	Comment

Total: 0 comment(s)

CONDITIONS OF APPROVAL:

FORM 15
Rev 10/11

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80205 Phone: (303) 894-2100 Fax: (303) 894-2109

OGCC RECEPTION

Document Number:

EARTHEN PIT REPORT / PERMIT

This form is to be used for both reporting and permitting pits. Rule 903 describes when a Permit with prior approval, or a Report within 30 days is required for pits. Submit required attachments and forms.

Form Type: ☑ **PERMIT** ☐ **REPORT** OGCC PIT NUMBER: _____

NOTE: Operator to provide OGCC Pit Number only if available on an existing pit for pit report

ATTACHMENTS

Detailed Site Plan	
Design/Cross Sec	
Topo Map	
Calculations	
Sensitive Area Info	
Mud Program	
Form 2A	
Form 26	
Water Analysis	

OGCC Operator Number: 36,200 Contact Name: W. Gene Webb

Name of Operator: Grynberg Jack J (Grynberg Petroleum Company)

Address: 3600 S. Yosemite Street, Suite #900 Phone: (303) 850-7490

City: Denver State: CO Zip: 80237 Email: g.webb@grynberg.com

Pit Location Information

Operator's Pit/Facility Name: Hiawatha Deep 4-36 Operator's Pit/Facility Number: HIAWATHA DEEP-612N101W 36SWSW

API Number (associated well): 05- 081 7427 ____

OGCC Location ID (associated location): 313388 Or Form 2A # _____

Pit Location (QtrQtr, Sec, Twp, Rng, Meridian): SWSW-S36 -12N-101W- 6thPM

Latitude: 40.951410 Longitude: -108.703640 County: Moffat

Operation Information

Pit Use/Type (Check all that apply): Pit Type: ☐ Lined ☑ Unlined

☐ Drilling: (Ancillary, Completion, Flowback, Reserve Pits) ☐ Oil-based Mud; ☐ Salt Sections or High Chloride Mud

☐ Production: ☐ Skimming/Settling; ☐ Produced Water Storage; ☐ Percolation; ☐ Evaporation

☐ Special Purpose: ☑ Flare; ☐ Emergency; ☐ Blowdown; ☐ Workover; ☐ Plugging; ☐ BS&W/Tank Bottoms

☐ Multi-Well Pit: Construction Date: _____ Actual or Planned: _____

Method of treatment prior to discharge into pit: _____

Offsite disposal of pit contents: ☐ Injection; ☐ Commercial; ☐ Reuse/Recycle; ☐ NPDES; Permit Number: _____

Other Information:

Site Conditions

Distance (in feet) to the nearest surface water: 3,500 Ground Water (depth): 800 Water Well: 7,920

Is this location in a Sensitive Area? No Existing Location? No

Pit Design and Construction

Size of Pit (in feet): Length: 8 Width: 8 Depth: 8 Calc. Volume (barrels): _____

Flow Rates (in bbl/day): Inflow: _____ Outflow: _____ Evaporation: _____ Percolation: _____

Primary Liner. Type: _____ Thickness (mil): _____

Seconday Liner (if present): Type: _____ Thickness (mil): _____

Is Pit Fenced? No Is Pit Netted? No Leak Detection? No

Other Information:

Operator Comments:

Certification

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

Signed: _____ Print Name: Jack J. Grynberg

Title: President Email: grynpetro@grynberg.com Date: 02/27/2012

Approval

Signed: _____ Title: _____ Date: _____

BMP

Type	Comment

Total: 0 comment(s)

CONDITIONS OF APPROVAL:

FORM 4
Rev 12/05

State of Colorado
Oil and Gas Conservation Commission

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

DE	ET	GE	ES

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.)

1. OGCC Operator Number: 36200
2. Name of Operator: Grynberg Jack J (Grynberg Petroleum Compa
3. Address: 3600 Yosemite Street, Suite #900
City: Denver State: CO Zip: 80237
4. Contact Name: W. Gene Webb
Phone: 303.850.7490
Fax: 303.850.7498

Complete the Attachment Checklist

	OP	OGCC
Survey Plat		
Directional Survey		
Surface Eqpmt Diagram		
Technical Info Page	X	
Other		

5. API Number 05- 081-07427
OGCC Facility ID Number 313388
6. Well/Facility Name: Hiawatha Deep 4-36 Pit
7. Well/Facility Number HIAWATHA DEEP-612N101W
8. Location (QtrQtr, Sec, Twp, Rng, Meridian): SWSW, Sec. 36, T12N, R101W, 6PM
9. County: Moffat
10. Field Name: Sugar Loaf - #80000
11. Federal, Indian or State Lease Number:

General Notice

☐ CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)

	FNL/FSL		FEL/FWL	
Change of **Surface** Footage **from** Exterior Section Lines:				
Change of **Surface** Footage **to** Exterior Section Lines:				
Change of **Bottomhole** Footage **from** Exterior Section Lines:				
Change of **Bottomhole** Footage **to** Exterior Section Lines:				attach directional survey

Bottomhole location Qtr/Qtr, Sec, Twp, Rng, Mer
Latitude
Longitude
Ground Elevation
Distance to nearest property line
Distance to nearest lease line
Distance to nearest well same formation
Distance to nearest bldg, public rd, utility or RR
Is location in a High Density Area (rule 603b)? Yes/No
Surface owner consultation date:

GPS DATA:
Date of Measurement PDOP Reading Instrument Operator's Name

☐ CHANGE SPACING UNIT

Formation	Formation Code	Spacing order number	Unit Acreage	Unit configuration

☐ Remove from surface bond
Signed surface use agreement attached

☐ CHANGE OF OPERATOR (prior to drilling):
Effective Date:
Plugging Bond: ☐ Blanket ☐ Individual

☐ CHANGE WELL NAME NUMBER
From:
To:
Effective Date:

☐ ABANDONED LOCATION:
Was location ever built? ☐ Yes ☐ No
Is site ready for Inspection? ☐ Yes ☐ No
Date Ready for Inspection:

☐ NOTICE OF CONTINUED SHUT IN STATUS
Date well shut in or temporarily abandoned:
Has Production Equipment been removed from site? ☐ Yes ☐ No
MIT required if shut in longer than two years. Date of last MIT

☐ SPUD DATE:

☐ REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)

☐ SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK *submit cbl and cement job summaries

Method used	Cementing tool setting/perf depth	Cement volume	Cement top	Cement bottom	Date

☐ RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004.
Final reclamation will commence on approximately
☐ Final reclamation is completed and site is ready for inspection.

Technical Engineering/Environmental Notice

☐ Notice of Intent
Approximate Start Date:

☐ Report of Work Done
Date Work Completed:

Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)

☐ Intent to Recomplete (submit form 2)
☐ Change Drilling Plans
☐ Gross Interval Changed?
☐ Casing/Cementing Program Change
☐ Request to Vent or Flare
☐ Repair Well
☐ Rule 502 variance requested
☒ Other: Background Arsenic/SAR
☐ E&P Waste Disposal
☐ Beneficial Reuse of E&P Waste
☐ Status Update/Change of Remediation Plans for Spills and Releases

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

Signed: Date: 2/24/12 Email: grynpetro@grynberg.com
Print Name: Jack J. Grynberg Title: Executive Vice President

COGCC Approved: Title: Date:
CONDITIONS OF APPROVAL, IF ANY:

FORM 4 Rev 12/05

TECHNICAL INFORMATION PAGE

FOR OGCC USE ONLY

1. OGCC Operator Number: 36200 API Number: 05-081-07427
2. Name of Operator: Grynberg Jack J (Grynberg Petroleu OGCC Facility ID # 313388
3. Well/Facility Name: Hiawatha Deep 4-36 Pit Well/Facility Number: 612N101W 36S
4. Location (QtrQtr, Sec, Twp, Rng, Meridian): SWSW, Sec. 36, T12N, R101W, 6PM

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**

This COGCC Form 4 is being submitted as a request for the following items at the Hiawatha Deep 4-36:

*Consideration of elevated electrical conductivity and pH levels in deeper soils and,
*Use of background arsenic concentrations.

This COGCC Form 4 is being submitted to amend the existing open Form 27 (Remediation # 5586) for the Hiawatha Deep 4-36 location. During a site inspection by the COGCC Area Field Inspector on April 5, 2011 a compromise in the drilling pit liner below fluid level was documented. As specified in COGCC Rule 905.c a Spill/Release Report, Form 19, was prepared and submitted on April 13, 2011 (Spill/Release Tracking #2213272). Investigation, sampling and closure activities have since been completed and are summarized in the attached notice of completion report. Analytical results indicate exceedences with COGCC Table 910-1 of electrical conductivity, pH and arsenic concentrations.

Fifteen confirmation samples were collected from various locations within the drilling pit bottom (approximately 13-14 feet below surrounding grade) and sidewalls in June 2011 and analyzed for the Table 910-1 requirements. The results indicated that the soil exceeded Table 910-1 background standards for Arsenic at each location, electrical conductivity at eight locations and pH at one location.

*Arsenic Concentrations
Five grab background samples were collected from nearby non-impacted, native soil from a depth of 0-6 inches and three grab backgound samples from a depth of 10.5-13 feet below ground surface and analyzed for Arsenic in June 2011. The concentrations found in the confirmation samples are below at least one of the background samples. Grynberg is requesting that the arsenic concentration of the confirmation samples be considered within allowable background levels.

Deep 4-36 TP-1 (confirmation sample) - 19.7 mg/kg
Deep 4-36 TP-3 (confirmation sample) - 56.0 mg/kg
Deep 4-36 TP-8 (confirmation sample) - 25.7 mg/kg
Deep 4-36 TP-13 (confirmation sample) - 9.3 mg/kg
Deep 4-36 TP-15 (confirmation sample) - 24.6 mg/kg
Deep 4-36 TP-17 (confirmation sample) - 29.3 mg/kg
Deep 4-36 TP-19 (confirmation sample) - 46.9 mg/kg
Deep 4-36 TP-24 (confirmation sample) - 31.2 mg/kg
Deep 4-36 TP-29 (confirmation sample) - 46.1 mg/kg
Deep 4-36 TP-31 (confirmation sample) - 46.2 mg/kg
Deep 4-36 ESW (confirmation sample) - 10.8 mg/kg
Deep 4-36 NSW (confirmation sample) - 15.4 mg/kg
Deep 4-36 SSW (confirmation sample) - 27.9 mg/kg
Deep 4-36 WSW (confirmation sample) - 13.5 mg/kg
Deep 4-36 CBD (confirmation sample) - 20.8 mg/kg

BG1 (background) - 17.2 mg/kg
BG2 (background) - 17.3 mg/kg
BG3 (background) - 19.8 mg/kg
BG4 (background) - 17.9 mg/kg
BG5 (background) - 17.9 mg/kg
DEEP 4-36 BG6 (background) - 87.7 mg/kg
DEEP 4-36 BG7 (background) - 41.3 mg/kg
DEEP 4-36 BG8 (background) - 5.7 mg/kg

*Electrical Conductivity & pH
As shown in the analytical results summary, the electrical conductivity at eight confirmation sample locations and the pH at one location exceeds the COGCC Table 910-1 allowable concentrations. Grynberg is requesting COGCC consideration that elevated electrical conductivity and pH levels in deeper soils should not adversely affect the successful reclamation of the site as these soils are not within three feet of the ground surface.

A sample location map, data summary table and laboratory analytical results have been submitted with the notice of completion report (included).

Appendix B
Grynberg Petroleum Company
Hiawatha Deep 4-36 Pit Closure

PHOTO 1

Date: May 5, 2011
View: Drilling pit content mixing and removal activities. Looking southwest.

PHOTO 2

Date: May 5, 2011
View: Drilling pit content mixing and removal activities. Looking south.

PHOTO 3

Date: May 25, 2011
View: Drilling pit content mixing and removal activities. Looking south.

Appendix B
Grynberg Petroleum Company
Hiawatha Deep 4-36 Pit Closure

PHOTO 4

Date: May 25, 2011
View: Flare pit pothole excavation and sample location.

PHOTO 5

Date: June 6, 2011
View: Test pit excavation. Looking east.

PHOTO 6

Date: June 6, 2011
View: Excavated test pit locations. Looking southeast.

Appendix B
Grynberg Petroleum Company
Hiawatha Deep 4-36 Pit Closure

PHOTO 7

Date: June 6, 2011
View: Excavated test pit locations. Looking northwest.

PHOTO 8

Date: June 7, 2011
View: Excavated test pit locations. Looking southwest.

PHOTO 9

Date: June 7, 2011
View: Typical soils found in test pits.

Appendix B
Grynberg Petroleum Company
Hiawatha Deep 4-36 Pit Closure

	**PHOTO 10** **Date:** June 7, 2011 **View:** Typical soils found in test pits.
	**PHOTO 11** **Date:** June 7, 2011 **View:** Visual “hotspot” removal on east sidewall.
	**PHOTO 12** **Date:** June 7, 2011 **View:** Visual “hotspot” removal on center berm divider.

Appendix B
Grynberg Petroleum Company
Hiawatha Deep 4-36 Pit Closure

PHOTO 13

Date: June 28, 2011
View: View of former drilling pit location after backfilling and re-contouring. Looking southwest.

PHOTO 14

Date: June 28, 2011
View: View of former drilling pit location after backfilling and re-contouring. Looking west.

Mountain States ACCUTEST LABORATORIES

06/27/11

Technical Report for

Olsson Associates

Grynberg Deep 4-36

(011-0383_100_100001)

Accutest Job Number: D24307

Sampling Dates: 06/06/11 - 06/08/11

Report to:

Olsson Associates

kkreie@oaconsulting.com

ATTN: Ken Kreie

Total number of pages in report: **146**

ACCREDITED IN ACCORDANCE WITH nelac

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.

John Hamilton
Laboratory Director

Client Service contact: 303-425-6021

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

Test results relate only to samples analyzed.

Sections: 1 2 3 4

Table of Contents

-1-

Section 1: Sample Summary **3**
Section 2: Case Narrative/Conformance Summary **6**
Section 3: Sample Results **11**
3.1: D24307-1: DEEP 4-36 TP-1 (0-1') 12
3.2: D24307-1A: DEEP 4-36 TP-1 (0-1') 18
3.3: D24307-2: DEEP 4-36 TP-3 (0-1') 20
3.4: D24307-2A: DEEP 4-36 TP-3 (0-1') 26
3.5: D24307-3: DEEP 4-36 TP-8 (0-1') 28
3.6: D24307-3A: DEEP 4-36 TP-8 (0-1') 34
3.7: D24307-4: DEEP 4-36 TP-13 (0-1') 36
3.8: D24307-4A: DEEP 4-36 TP-13 (0-1') 42
3.9: D24307-5: DEEP 4-36 TP-15 (0-1') 44
3.10: D24307-5A: DEEP 4-36 TP-15 (0-1') 50
3.11: D24307-6: DEEP 4-36 TP-17 (0-1') 52
3.12: D24307-6A: DEEP 4-36 TP-17 (0-1') 58
3.13: D24307-7: DEEP 4-36 TP-19 (0-1') 60
3.14: D24307-7A: DEEP 4-36 TP-19 (0-1') 66
3.15: D24307-8: DEEP 4-36 TP-24 (0-1') 68
3.16: D24307-8A: DEEP 4-36 TP-24 (0-1') 74
3.17: D24307-9: DEEP 4-36 TP-29 (0-1') 76
3.18: D24307-9A: DEEP 4-36 TP-29 (0-1') 82
3.19: D24307-10: DEEP 4-36 TP-31 (0-1') 84
3.20: D24307-10A: DEEP 4-36 TP-31 (0-1') 90
3.21: D24307-11: DEEP 4-36 SSW 92
3.22: D24307-11A: DEEP 4-36 SSW 98
3.23: D24307-12: DEEP 4-36 WSW 100
3.24: D24307-12A: DEEP 4-36 WSW 106
3.25: D24307-13: DEEP 4-36 NSW 108
3.26: D24307-13A: DEEP 4-36 NSW 114
3.27: D24307-14: DEEP 4-36 ESW 116
3.28: D24307-14A: DEEP 4-36 ESW 122
3.29: D24307-15: DEEP 4-36 CBD 124
3.30: D24307-15A: DEEP 4-36 CBD 130
3.31: D24307-16: BG1 132
3.32: D24307-16A: BG1 134
3.33: D24307-17: BG2 136
3.34: D24307-18: BG3 137
3.35: D24307-19: BG4 138
3.36: D24307-20: BG5 139
Section 4: Misc. Forms **140**
4.1: Chain of Custody 141
4.2: Chain of Custody (Accutest Labs of New England, Inc.) 144

Sample Summary

Olsson Associates

Job No: D24307

Grynberg Deep 4-36
Project No: (011-0383_100_100001)

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D24307-1	06/06/11	13:50	JK	06/11/11	SO	Soil	DEEP 4-36 TP-1 (0-1')
D24307-1A	06/06/11	13:50	JK	06/11/11	SO	Soil	DEEP 4-36 TP-1 (0-1')
D24307-2	06/06/11	14:10	JK	06/11/11	SO	Soil	DEEP 4-36 TP-3 (0-1')
D24307-2A	06/06/11	14:10	JK	06/11/11	SO	Soil	DEEP 4-36 TP-3 (0-1')
D24307-3	06/06/11	14:25	JK	06/11/11	SO	Soil	DEEP 4-36 TP-8 (0-1')
D24307-3A	06/06/11	14:25	JK	06/11/11	SO	Soil	DEEP 4-36 TP-8 (0-1')
D24307-4	06/07/11	09:30	JK	06/11/11	SO	Soil	DEEP 4-36 TP-13 (0-1')
D24307-4A	06/07/11	09:30	JK	06/11/11	SO	Soil	DEEP 4-36 TP-13 (0-1')
D24307-5	06/07/11	09:45	JK	06/11/11	SO	Soil	DEEP 4-36 TP-15 (0-1')
D24307-5A	06/07/11	09:45	JK	06/11/11	SO	Soil	DEEP 4-36 TP-15 (0-1')
D24307-6	06/07/11	10:10	JK	06/11/11	SO	Soil	DEEP 4-36 TP-17 (0-1')
D24307-6A	06/07/11	10:10	JK	06/11/11	SO	Soil	DEEP 4-36 TP-17 (0-1')
D24307-7	06/07/11	10:25	JK	06/11/11	SO	Soil	DEEP 4-36 TP-19 (0-1')

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

Sample Summary
(continued)

Olsson Associates

Job No: D24307

Grynberg Deep 4-36
Project No: (011-0383_100_100001)

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D24307-7A	06/07/11	10:25	JK	06/11/11	SO	Soil	DEEP 4-36 TP-19 (0-1')
D24307-8	06/07/11	11:05	JK	06/11/11	SO	Soil	DEEP 4-36 TP-24 (0-1')
D24307-8A	06/07/11	11:05	JK	06/11/11	SO	Soil	DEEP 4-36 TP-24 (0-1')
D24307-9	06/08/11	12:30	JK	06/11/11	SO	Soil	DEEP 4-36 TP-29 (0-1')
D24307-9A	06/08/11	12:30	JK	06/11/11	SO	Soil	DEEP 4-36 TP-29 (0-1')
D24307-10	06/08/11	12:45	JK	06/11/11	SO	Soil	DEEP 4-36 TP-31 (0-1')
D24307-10A	06/08/11	12:45	JK	06/11/11	SO	Soil	DEEP 4-36 TP-31 (0-1')
D24307-11	06/07/11	15:10	JK	06/11/11	SO	Soil	DEEP 4-36 SSW
D24307-11A	06/07/11	15:10	JK	06/11/11	SO	Soil	DEEP 4-36 SSW
D24307-12	06/07/11	15:20	JK	06/11/11	SO	Soil	DEEP 4-36 WSW
D24307-12A	06/07/11	15:20	JK	06/11/11	SO	Soil	DEEP 4-36 WSW
D24307-13	06/07/11	15:35	JK	06/11/11	SO	Soil	DEEP 4-36 NSW
D24307-13A	06/07/11	15:35	JK	06/11/11	SO	Soil	DEEP 4-36 NSW

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

Sample Summary
(continued)

Olsson Associates

Job No: D24307

Grynberg Deep 4-36
Project No: (011-0383_100_100001)

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D24307-14	06/07/11	15:55	JK	06/11/11	SO	Soil	DEEP 4-36 ESW
D24307-14A	06/07/11	15:55	JK	06/11/11	SO	Soil	DEEP 4-36 ESW
D24307-15	06/07/11	16:10	JK	06/11/11	SO	Soil	DEEP 4-36 CBD
D24307-15A	06/07/11	16:10	JK	06/11/11	SO	Soil	DEEP 4-36 CBD
D24307-16	06/08/11	13:35	JK	06/11/11	SO	Soil	BG1
D24307-16A	06/08/11	13:35	JK	06/11/11	SO	Soil	BG1
D24307-17	06/08/11	13:45	JK	06/11/11	SO	Soil	BG2
D24307-18	06/08/11	13:55	JK	06/11/11	SO	Soil	BG3
D24307-19	06/08/11	14:00	JK	06/11/11	SO	Soil	BG4
D24307-20	06/06/11	14:05	JK	06/11/11	SO	Soil	BG5

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Olsson Associates	**Job No**	D24307
Site:	Grynberg Deep 4-36	**Report Dat**	6/27/2011 9:54:43 AM

On 06/11/2011, 20 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D24307 was assigned to the project. The lab sample IDs, client sample IDs, and dates 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:** V6V338

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24293-1MS, D24293-1MSD were used as the QC samples indicated.

Matrix SO **Batch ID:** V6V339

- All samples were analyzed within the recommended method holding time.
- Sample(s) D24307-4MS, D24307-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO **Batch ID:** V6V342

- All samples were analyzed within the recommended method holding time.
- Sample(s) D24562-1MS, D24562-1MSD 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:** OP3859

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D24162-1MS, D24162-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike and matrix spike duplicate (MS/MSD) recovery(s) of several analytes are outside control limits. Outside control limits due to dilution.
- The RPD(s) for the MS and MSD recoveries of Anthracene, Fluoranthene, Fluorene, Naphthalene, Pyrene are outside control limits for sample OP3859-MSD. Variability of recovery may be due to sample matrix/homogeneity.
- The matrix spike duplicate (MSD) recovery of Fluorene is outside control limits. Outside control limits due to high level in sample relative to spike amount.
- D24307-1 through D24307-13, and D24307-15: Elevated RL due to matrix interference.

Volatiles by GC By Method SW846 8015B

Matrix SO **Batch ID:** GGA665

- All samples were analyzed within the recommended method holding time.
- Sample(s) D24264-1MS, D24264-1MSD 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:** OP3889

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24506-1MS, D24506-1MSD were used as the QC samples indicated.

Matrix SO **Batch ID:** OP3900

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D24585-1MS, D24585-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010B

Matrix AQ **Batch ID:** MP4939

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24307-2AMS, D24307-2AMSD were used as the QC samples for the metals analysis.

Matrix AQ **Batch ID:** MP4966

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24307-9AMS, D24307-9AMSD were used as the QC samples for the metals analysis.

Matrix AQ **Batch ID:** MP4967

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24307-15AMS, D24307-15AMSD were used as the QC samples for the metals analysis.

Matrix SO **Batch ID:** MP4946

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24307-1MS, D24307-1MSD, D24307-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Silver are outside control limits. Spike recovery indicates possible matrix interference.
- The matrix spike duplicate (MSD) recovery(s) of Lead, Nickel, Selenium, Silver are outside control limits. Probable cause due to matrix interference.
- The serial dilution RPD(s) for Selenium, Silver are outside control limits for sample MP4946-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- The serial dilution RPD(s) for Barium, Chromium, Nickel, Zinc are outside control limits for sample MP4946-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

Matrix	SO	Batch ID:	MP4947

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24307-1MS, D24307-1MSD, D24307-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP4947-SD1. Serial dilution indicates possible matrix interference.

Matrix	SO	Batch ID:	MP4961

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24463-1MS, D24463-1MSD, D24463-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP4961-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 7471A

Matrix	SO	Batch ID:	MP5000

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24150-3MS, D24150-3MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method ASTM D1498-76M

Matrix	SO	Batch ID:	GN9987

- Sample(s) D24302-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

Matrix	SO	Batch ID:	GN9988

- Sample(s) D24307-10DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

Wet Chemistry By Method SM19 2540B M

Matrix	SO	Batch ID:	GN10038

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

Wet Chemistry By Method SW846 3060/7196A M

Matrix	SO	Batch ID:	R7994

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

Wet Chemistry By Method SW846 3060A/7196A

Matrix	SO	Batch ID:	M:GP13102

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Matrix	SO	Batch ID:	M:GP13126

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SW846 9045C

Matrix	SO	Batch ID:	GN9986

- The following samples were run outside of holding time for method SW846 9045C: D24307-1 through D24307-16.

Wet Chemistry By Method USDA HANDBOOK 60

Matrix	SO	Batch ID:	MP4939

- Sodium Adsorption Ratio: Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+(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.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client:	Accutest Mountain States	**Job No**	D24307
Site:	CORCCOGJ: Grynberg Deep 4-36	**Report Date**	6/23/2011 9:02:47 AM

16 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 06/06/2011 and were received at Accutest on 06/11/2011 properly preserved, at 2.1 Deg. C and intact. These Samples received an Accutest job number of D24307. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO **Batch ID:** GP13102

- All samples were distilled 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) D24283-1AMS, D24283-1ADUP were used as the QC samples for Chromium, Hexavalent.
- RPD(s) for Duplicate for Chromium, Hexavalent are outside control limits for sample GP13102-D1. RPD acceptable due to low duplicate and sample concentrations.

Matrix SO **Batch ID:** GP13126

- All samples were distilled 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) D24302-4DUP, D24302-4MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety.The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D24307).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06568.D	1	06/17/11	DC	n/a	n/a	V6V338
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	73	32	ug/kg	
108-88-3	Toluene	ND	150	73	ug/kg	
100-41-4	Ethylbenzene	ND	150	37	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	88%		70-130%
460-00-4	4-Bromofluorobenzene	91%		70-130%
17060-07-0	1,2-Dichloroethane-D4	87%		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:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04491.D	2	06/16/11	TMB	06/14/11	OP3859	E3G168
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	30	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	18	ug/kg	
218-01-9	Chrysene	ND	41	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	49	45	ug/kg	
91-20-3	Naphthalene	ND	16	16	ug/kg	
129-00-0	Pyrene	ND	16	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	68%		10-193%
321-60-8	2-Fluorobiphenyl	61%		20-138%
1718-51-0	Terphenyl-d14	74%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12246.D	1	06/16/11	SK	n/a	n/a	GGA665
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	15	7.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	76%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07379.D	1	06/24/11	JB	06/17/11	OP3889	GFD322
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	16	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	77%		61-142%

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:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	19.1	0.48	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	50.6	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	10.9	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	23.4	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	16.2	6.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.11	0.11	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	16.1	3.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 6.1	6.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.6	3.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	65.8	3.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.85	0.48	mg/kg	1	06/17/11 15:45	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	10.1	1.7	mg/kg	1	06/17/11 15:45	AMA	SW846 3060/7196A M
Redox Potential Vs H2	484		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	80.9		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	2590	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.71		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1A	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	225	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	129	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	302	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1598
(2) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-1 (0-1')		
Lab Sample ID:	D24307-1A	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	3.97		ratio	1	06/16/11 03:55	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	80.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06569.D	1	06/17/11	DC	n/a	n/a	V6V338
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	74	33	ug/kg	
108-88-3	Toluene	ND	150	74	ug/kg	
100-41-4	Ethylbenzene	ND	150	37	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	94%		70-130%
460-00-4	4-Bromofluorobenzene	99%		70-130%
17060-07-0	1,2-Dichloroethane-D4	90%		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:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	80.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04458.D	2	06/15/11	TMB	06/14/11	OP3859	E3G167
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	17	13	ug/kg	
120-12-7	Anthracene	ND	17	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	22	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	30	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	31	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	18	ug/kg	
218-01-9	Chrysene	ND	41	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	31	ug/kg	
206-44-0	Fluoranthene	ND	17	17	ug/kg	
86-73-7	Fluorene	ND	17	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	50	46	ug/kg	
91-20-3	Naphthalene	ND	17	16	ug/kg	
129-00-0	Pyrene	ND	17	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	64%		10-193%
321-60-8	2-Fluorobiphenyl	61%		20-138%
1718-51-0	Terphenyl-d14	66%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	80.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12247.D	1	06/16/11	SK	n/a	n/a	GGA665
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	15	7.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	79%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	80.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07380.D	1	06/24/11	JB	06/17/11	OP3889	GFD322
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	17	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	82%		61-142%

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:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.3
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	56.0	0.50	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	54.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	11.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	23.5	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	16.8	6.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.11	0.11	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	21.5	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 6.2	6.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.7	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	73.1	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.3
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.98	0.50	mg/kg	1	06/17/11 15:45	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	10.7	1.7	mg/kg	1	06/17/11 15:45	AMA	SW846 3060/7196A M
Redox Potential Vs H2	486		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	80.3		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	3720	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.61		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2A	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.3
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	315	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	176	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	499	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1598
(2) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-3 (0-1')		
Lab Sample ID:	D24307-2A	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.3
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	5.59		ratio	1	06/16/11 03:35	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	83.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06657.D	1	06/20/11	DC	n/a	n/a	V6V342
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.13 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	68	30	ug/kg	
108-88-3	Toluene	ND	140	68	ug/kg	
100-41-4	Ethylbenzene	ND	140	34	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	86%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%
17060-07-0	1,2-Dichloroethane-D4	86%		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:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	83.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04459.D	2	06/15/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	29	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	17	ug/kg	
218-01-9	Chrysene	ND	40	17	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	29	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	48	44	ug/kg	
91-20-3	Naphthalene	ND	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	62%		10-193%
321-60-8	2-Fluorobiphenyl	52%		20-138%
1718-51-0	Terphenyl-d14	69%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	83.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12248.D	1	06/16/11	SK	n/a	n/a	GGA665
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)	ND	14	6.8	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	76%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	83.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07250.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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	16	10	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	93%		61-142%

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:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.9
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	25.7	0.47	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	84.4	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	11.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	26.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	18.9	5.9	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.12	0.12	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	20.3	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.9	5.9	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.5	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	76.9	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.9
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.93	0.47	mg/kg	1	06/17/11 15:45	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	10.8	1.7	mg/kg	1	06/17/11 15:45	AMA	SW846 3060/7196A M
Redox Potential Vs H2	468		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	83.9		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	4260	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.70		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3A	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.9
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	335	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	200	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	628	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1598
(2) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-8 (0-1')		
Lab Sample ID:	D24307-3A	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.9
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	6.71		ratio	1	06/16/11 04:02	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	82.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06577.D	1	06/17/11	DC	n/a	n/a	V6V339
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	70	31	ug/kg	
108-88-3	Toluene	ND	140	70	ug/kg	
100-41-4	Ethylbenzene	ND	140	35	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	95%		70-130%
460-00-4	4-Bromofluorobenzene	99%		70-130%
17060-07-0	1,2-Dichloroethane-D4	93%		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:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	82.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04460.D	2	06/15/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	18	ug/kg	
218-01-9	Chrysene	ND	40	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	48	44	ug/kg	
91-20-3	Naphthalene	ND	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	64%		10-193%
321-60-8	2-Fluorobiphenyl	61%		20-138%
1718-51-0	Terphenyl-d14	80%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	82.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12249.D	1	06/16/11	SK	n/a	n/a	GGA665
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)	ND	14	7.0	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	78%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	82.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07251.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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)	ND	16	10	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	89%		61-142%

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:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.8
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	9.3	0.48	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	64.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	9.1	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	20.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	12.0	6.0	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.10	0.10	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	17.3	3.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 6.0	6.0	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.6	3.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	54.3	3.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.8
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.80	0.48	mg/kg	1	06/17/11 15:45	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	8.3	1.7	mg/kg	1	06/17/11 15:45	AMA	SW846 3060/7196A M
Redox Potential Vs H2	467		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	82.8		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	3440	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.56		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.8
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	317	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Magnesium	185	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Sodium	438	2.0	mg/l	1	06/15/11	06/17/11	JM	SW846 6010B [2]	EPA 200.7 [3]

(1) Instrument QC Batch: MA1598
(2) Instrument QC Batch: MA1604
(3) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-13 (0-1')		
Lab Sample ID:	D24307-4A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.8
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	4.84		ratio	1	06/17/11 18:40	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	81.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06580.D	1	06/18/11	DC	n/a	n/a	V6V339
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	73	32	ug/kg	
108-88-3	Toluene	ND	150	73	ug/kg	
100-41-4	Ethylbenzene	ND	150	36	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	95%		70-130%
460-00-4	4-Bromofluorobenzene	99%		70-130%
17060-07-0	1,2-Dichloroethane-D4	82%		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:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	81.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04461.D	2	06/15/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	18	ug/kg	
218-01-9	Chrysene	ND	41	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	49	45	ug/kg	
91-20-3	Naphthalene	ND	16	16	ug/kg	
129-00-0	Pyrene	ND	16	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	55%		10-193%
321-60-8	2-Fluorobiphenyl	52%		20-138%
1718-51-0	Terphenyl-d14	73%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	81.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12250.D	1	06/16/11	SK	n/a	n/a	GGA665
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	15	7.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	75%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	81.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07252.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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)	ND	16	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	80%		61-142%

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:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	81.4
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	24.6	0.46	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	72.6	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	12.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	22.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	18.1	5.8	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.10	0.10	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	20.4	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.8	5.8	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.5	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	86.2	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	81.4
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	< 0.49	0.49	mg/kg	1	06/17/11 15:45	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	11.8	1.7	mg/kg	1	06/17/11 15:45	AMA	SW846 3060/7196A M
Redox Potential Vs H2	477		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	81.4		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	3520	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	9.09		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	81.4
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	283	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Magnesium	189	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Sodium	425	2.0	mg/l	1	06/15/11	06/17/11	JY	SW846 6010B [2]	EPA 200.7 [3]

(1) Instrument QC Batch: MA1598
(2) Instrument QC Batch: MA1602
(3) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-15 (0-1')		
Lab Sample ID:	D24307-5A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	81.4
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	4.80		ratio	1	06/17/11 08:07	JY	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	83.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06581.D	1	06/18/11	DC	n/a	n/a	V6V339
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	70	31	ug/kg	
108-88-3	Toluene	ND	140	70	ug/kg	
100-41-4	Ethylbenzene	ND	140	35	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	92%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%
17060-07-0	1,2-Dichloroethane-D4	82%		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:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	83.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04492.D	2	06/16/11	TMB	06/14/11	OP3859	E3G168
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	18	ug/kg	
218-01-9	Chrysene	ND	40	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	48	44	ug/kg	
91-20-3	Naphthalene	ND	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		10-193%
321-60-8	2-Fluorobiphenyl	64%		20-138%
1718-51-0	Terphenyl-d14	80%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	83.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12251.D	1	06/16/11	SK	n/a	n/a	GGA665
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	14	7.0	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	76%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	83.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07253.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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)	ND	16	10	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	89%		61-142%

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:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.1
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	29.3	0.45	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	66.0	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.1	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	11.3	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	24.0	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	19.6	5.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.11	0.11	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	21.1	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.7	5.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.4	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	96.8	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.61	0.46	mg/kg	1	06/17/11 15:45	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	10.7	1.6	mg/kg	1	06/17/11 15:45	AMA	SW846 3060/7196A M
Redox Potential Vs H2	496		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	83.1		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	3360	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.76		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.1
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	237	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Magnesium	173	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Sodium	369	2.0	mg/l	1	06/15/11	06/17/11	JY	SW846 6010B [2]	EPA 200.7 [3]

(1) Instrument QC Batch: MA1598
(2) Instrument QC Batch: MA1602
(3) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-17 (0-1')		
Lab Sample ID:	D24307-6A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	4.45		ratio	1	06/17/11 08:14	JY	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06582.D	1	06/18/11	DC	n/a	n/a	V6V339
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	72	32	ug/kg	
108-88-3	Toluene	ND	140	72	ug/kg	
100-41-4	Ethylbenzene	ND	140	36	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	89%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%
17060-07-0	1,2-Dichloroethane-D4	88%		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:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04463.D	2	06/15/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	18	ug/kg	
218-01-9	Chrysene	ND	41	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	49	45	ug/kg	
91-20-3	Naphthalene	ND	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	59%		10-193%
321-60-8	2-Fluorobiphenyl	55%		20-138%
1718-51-0	Terphenyl-d14	68%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12252.D	1	06/16/11	SK	n/a	n/a	GGA665
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	14	7.2	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	78%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07254.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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)	ND	16	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	91%		61-142%

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:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	46.9	0.46	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	65.0	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.1	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	12.6	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	23.6	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	16.1	5.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.12	0.12	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	18.2	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.7	5.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.4	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	70.7	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.91	0.48	mg/kg	1	06/17/11 15:45	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	11.7	1.6	mg/kg	1	06/17/11 15:45	AMA	SW846 3060/7196A M
Redox Potential Vs H2	487		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	82.1		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	5040	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.30		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	423	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Magnesium	306	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Sodium	490	2.0	mg/l	1	06/15/11	06/17/11	JY	SW846 6010B [2]	EPA 200.7 [3]

(1) Instrument QC Batch: MA1598
(2) Instrument QC Batch: MA1602
(3) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-19 (0-1')		
Lab Sample ID:	D24307-7A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	4.43		ratio	1	06/17/11 08:21	JY	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	84.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06583.D	1	06/18/11	DC	n/a	n/a	V6V339
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	69	30	ug/kg	
108-88-3	Toluene	ND	140	69	ug/kg	
100-41-4	Ethylbenzene	ND	140	34	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	92%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%
17060-07-0	1,2-Dichloroethane-D4	86%		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:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	84.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04464.D	2	06/15/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	28	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	29	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	17	ug/kg	
218-01-9	Chrysene	ND	40	17	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	29	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	13	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	47	44	ug/kg	
91-20-3	Naphthalene	ND	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		10-193%
321-60-8	2-Fluorobiphenyl	65%		20-138%
1718-51-0	Terphenyl-d14	81%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	84.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12254.D	1	06/16/11	SK	n/a	n/a	GGA665
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	14	6.9	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	80%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	84.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07257.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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)	ND	16	10	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	85%		61-142%

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:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	84.1
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	31.2	0.47	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	95.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	12.1	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	21.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	18.9	5.8	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.10	0.10	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	20.9	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.8	5.8	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.5	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	86.8	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	84.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.90	0.47	mg/kg	1	06/17/11 16:03	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	11.2	1.7	mg/kg	1	06/17/11 16:03	AMA	SW846 3060/7196A M
Redox Potential Vs H2	482		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	84.1		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	2090	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.36		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	84.1
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	95.9	2.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Magnesium	86.0	1.0	mg/l	1	06/15/11	06/16/11	JM	SW846 6010B [1]	EPA 200.7 [3]
Sodium	274	2.0	mg/l	1	06/15/11	06/17/11	JY	SW846 6010B [2]	EPA 200.7 [3]

(1) Instrument QC Batch: MA1598
(2) Instrument QC Batch: MA1602
(3) Prep QC Batch: MP4939

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-24 (0-1')		
Lab Sample ID:	D24307-8A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	84.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	4.90		ratio	1	06/17/11 08:27	JY	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	82.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06584.D	1	06/18/11	DC	n/a	n/a	V6V339
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.03 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	71	31	ug/kg	
108-88-3	Toluene	ND	140	71	ug/kg	
100-41-4	Ethylbenzene	ND	140	36	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	94%		70-130%
460-00-4	4-Bromofluorobenzene	100%		70-130%
17060-07-0	1,2-Dichloroethane-D4	90%		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:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	82.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04469.D	2	06/16/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	18	ug/kg	
218-01-9	Chrysene	ND	40	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	48	44	ug/kg	
91-20-3	Naphthalene	ND	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	59%		10-193%
321-60-8	2-Fluorobiphenyl	58%		20-138%
1718-51-0	Terphenyl-d14	73%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	82.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12255.D	1	06/16/11	SK	n/a	n/a	GGA665
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	14	7.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	78%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	82.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07258.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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	16	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	90%		61-142%

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:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.3
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	46.1	0.45	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	58.6	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.1	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	12.0	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	23.6	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	17.9	5.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.11	0.11	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	20.7	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.6	5.6	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.4	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	69.9	3.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.3
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.92	0.48	mg/kg	1	06/17/11 16:03	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	11.1	1.6	mg/kg	1	06/17/11 16:03	AMA	SW846 3060/7196A M
Redox Potential Vs H2	495		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	82.3		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	3770	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	8.32		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9A	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.3
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	305	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	155	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	445	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4966

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-29 (0-1')		
Lab Sample ID:	D24307-9A	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.3
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	5.18		ratio	1	06/18/11 00:52	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06585.D	1	06/18/11	DC	n/a	n/a	V6V339
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	71	31	ug/kg	
108-88-3	Toluene	ND	140	71	ug/kg	
100-41-4	Ethylbenzene	ND	140	35	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	89%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%
17060-07-0	1,2-Dichloroethane-D4	78%		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:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04470.D	2	06/16/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	18	ug/kg	
218-01-9	Chrysene	ND	40	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	49	45	ug/kg	
91-20-3	Naphthalene	ND	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	68%		10-193%
321-60-8	2-Fluorobiphenyl	63%		20-138%
1718-51-0	Terphenyl-d14	79%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12256.D	1	06/16/11	SK	n/a	n/a	GGA665
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)	ND	14	7.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	80%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	82.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07259.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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	16	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	92%		61-142%

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:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	46.2	0.47	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	72.6	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	11.9	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	20.5	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	17.2	5.9	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.11	0.11	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	18.6	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.9	5.9	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.5	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	71.1	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	< 0.48	0.48	mg/kg	1	06/17/11 16:03	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	11.6	1.7	mg/kg	1	06/17/11 16:03	AMA	SW846 3060/7196A M
Redox Potential Vs H2	467		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	82.1		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	4780	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	8.34		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10A	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	326	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	215	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	672	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4966

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 TP-31 (0-1')		
Lab Sample ID:	D24307-10A	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	82.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	7.09		ratio	1	06/18/11 01:12	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06586.D	1	06/18/11	DC	n/a	n/a	V6V339
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	72	32	ug/kg	
108-88-3	Toluene	ND	140	72	ug/kg	
100-41-4	Ethylbenzene	ND	140	36	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	93%		70-130%
460-00-4	4-Bromofluorobenzene	101%		70-130%
17060-07-0	1,2-Dichloroethane-D4	90%		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:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04471.D	2	06/16/11	TMB	06/14/11	OP3859	E3G167
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	16	13	ug/kg	
120-12-7	Anthracene	ND	16	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	30	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	18	ug/kg	
218-01-9	Chrysene	ND	41	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	30	ug/kg	
206-44-0	Fluoranthene	ND	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	49	45	ug/kg	
91-20-3	Naphthalene	ND	16	16	ug/kg	
129-00-0	Pyrene	ND	16	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	69%		10-193%
321-60-8	2-Fluorobiphenyl	63%		20-138%
1718-51-0	Terphenyl-d14	75%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12257.D	1	06/16/11	SK	n/a	n/a	GGA665
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)	ND	14	7.2	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	79%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	80.9
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07260.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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	16	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	89%		61-142%

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:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	27.9	0.49	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	64.0	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	8.3	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	14.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	16.3	6.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.12	0.12	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	15.7	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 6.1	6.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.7	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	63.0	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.2	0.49	mg/kg	1	06/17/11 16:03	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	7.1	1.7	mg/kg	1	06/17/11 16:03	AMA	SW846 3060/7196A M
Redox Potential Vs H2	494		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	80.9		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	6290	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	8.01		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	529	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	108	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	903	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4966

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 SSW		
Lab Sample ID:	D24307-11A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.9
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	9.34		ratio	1	06/18/11 01:18	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	79.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06587.D	1	06/18/11	DC	n/a	n/a	V6V339
Run #2							

	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	75	33	ug/kg	
108-88-3	Toluene	ND	150	75	ug/kg	
100-41-4	Ethylbenzene	ND	150	37	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	91%		70-130%
460-00-4	4-Bromofluorobenzene	98%		70-130%
17060-07-0	1,2-Dichloroethane-D4	85%		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:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	79.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04472.D	2	06/16/11	TMB	06/14/11	OP3859	E3G167
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	17	13	ug/kg	
120-12-7	Anthracene	ND	17	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	42	22	ug/kg	
50-32-8	Benzo(a)pyrene	ND	42	30	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	42	31	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	42	18	ug/kg	
218-01-9	Chrysene	ND	42	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	42	31	ug/kg	
206-44-0	Fluoranthene	ND	17	17	ug/kg	
86-73-7	Fluorene	ND	17	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	50	46	ug/kg	
91-20-3	Naphthalene	ND	17	16	ug/kg	
129-00-0	Pyrene	ND	17	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	67%		10-193%
321-60-8	2-Fluorobiphenyl	62%		20-138%
1718-51-0	Terphenyl-d14	77%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	79.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12258.D	1	06/16/11	SK	n/a	n/a	GGA665
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	15	7.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	80%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	79.8
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07261.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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	17	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	89%		61-142%

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:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	79.8
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	13.5	0.50	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	73.0	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	9.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	15.0	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	11.9	6.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.12	0.12	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	14.5	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 6.2	6.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.7	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	58.1	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	79.8
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.1	0.50	mg/kg	1	06/17/11 16:03	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	8.6	1.7	mg/kg	1	06/17/11 16:03	AMA	SW846 3060/7196A M
Redox Potential Vs H2	497		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	79.8		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	7210	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	7.88		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	79.8
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	477	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	227	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	1060	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4966

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 WSW		
Lab Sample ID:	D24307-12A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	79.8
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	10.0		ratio	1	06/18/11 01:45	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	80.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06588.D	1	06/18/11	DC	n/a	n/a	V6V339
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.03 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	74	33	ug/kg	
108-88-3	Toluene	ND	150	74	ug/kg	
100-41-4	Ethylbenzene	ND	150	37	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	92%		70-130%
460-00-4	4-Bromofluorobenzene	99%		70-130%
17060-07-0	1,2-Dichloroethane-D4	86%		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:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	80.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04473.D	2	06/16/11	TMB	06/14/11	OP3859	E3G167
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	17	13	ug/kg	
120-12-7	Anthracene	ND	17	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	30	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	31	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	18	ug/kg	
218-01-9	Chrysene	ND	41	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	31	ug/kg	
206-44-0	Fluoranthene	ND	17	17	ug/kg	
86-73-7	Fluorene	ND	17	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	50	45	ug/kg	
91-20-3	Naphthalene	ND	17	16	ug/kg	
129-00-0	Pyrene	ND	17	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		10-193%
321-60-8	2-Fluorobiphenyl	66%		20-138%
1718-51-0	Terphenyl-d14	83%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	80.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12259.D	1	06/16/11	SK	n/a	n/a	GGA665
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	15	7.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	81%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	80.4
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07262.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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)	106	17	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	97%		61-142%

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:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.4
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	15.4	0.50	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	133	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	10.3	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	15.6	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	13.0	6.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.12	0.12	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	13.6	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 6.2	6.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.7	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	63.3	3.7	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.4
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	1.2	0.49	mg/kg	1	06/17/11 16:03	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	9.1	1.7	mg/kg	1	06/17/11 16:03	AMA	SW846 3060/7196A M
Redox Potential Vs H2	503		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	80.4		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	6510	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	7.83		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.4
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	518	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	130	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	953	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4966

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 NSW		
Lab Sample ID:	D24307-13A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.4
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	9.69		ratio	1	06/18/11 01:55	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	83.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06589.D	1	06/18/11	DC	n/a	n/a	V6V339
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	31	ug/kg	
108-88-3	Toluene	ND	140	69	ug/kg	
100-41-4	Ethylbenzene	ND	140	35	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	90%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%
17060-07-0	1,2-Dichloroethane-D4	86%		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:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	83.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G04474.D	2	06/16/11	TMB	06/14/11	OP3859	E3G167
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	15.4	16	13	ug/kg	J
120-12-7	Anthracene	ND	16	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	40	21	ug/kg	
50-32-8	Benzo(a)pyrene	ND	40	29	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	40	30	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	40	18	ug/kg	
218-01-9	Chrysene	ND	40	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	40	30	ug/kg	
206-44-0	Fluoranthene	16.2	16	16	ug/kg	
86-73-7	Fluorene	ND	16	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	48	44	ug/kg	
91-20-3	Naphthalene	39.7	16	15	ug/kg	
129-00-0	Pyrene	ND	16	15	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	66%		10-193%
321-60-8	2-Fluorobiphenyl	58%		20-138%
1718-51-0	Terphenyl-d14	77%		17-174%

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:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	83.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12260.D	1	06/16/11	SK	n/a	n/a	GGA665
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)	ND	14	6.9	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	79%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	83.3
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07263.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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)	10.9	16	10	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	94%		61-142%

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:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.3
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	10.8	0.47	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	60.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	7.8	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	18.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	13.1	5.9	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.11	0.11	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	11.6	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.9	5.9	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.5	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	69.1	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.3
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.79	0.48	mg/kg	1	06/17/11 16:03	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	7.0	1.7	mg/kg	1	06/17/11 16:03	AMA	SW846 3060/7196A M
Redox Potential Vs H2	488		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	83.3		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	5730	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	8.27		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.3
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	359	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	243	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	799	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4966

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 ESW		
Lab Sample ID:	D24307-14A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	83.3
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	7.98		ratio	1	06/18/11 02:02	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8260B	**Percent Solids:**	80.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06590.D	1	06/18/11	DC	n/a	n/a	V6V339
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.11 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	74	32	ug/kg	
108-88-3	Toluene	ND	150	74	ug/kg	
100-41-4	Ethylbenzene	ND	150	37	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	91%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%
17060-07-0	1,2-Dichloroethane-D4	88%		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:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	80.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	3G04475.D	2	06/16/11	TMB	06/14/11	OP3859	E3G167
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	17	13	ug/kg	
120-12-7	Anthracene	ND	17	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	41	22	ug/kg	
50-32-8	Benzo(a)pyrene	ND	41	30	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	41	31	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	41	18	ug/kg	
218-01-9	Chrysene	ND	41	18	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	41	31	ug/kg	
206-44-0	Fluoranthene	ND	17	17	ug/kg	
86-73-7	Fluorene	ND	17	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	50	46	ug/kg	
91-20-3	Naphthalene	ND	17	16	ug/kg	
129-00-0	Pyrene	ND	17	16	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	60%		10-193%
321-60-8	2-Fluorobiphenyl	53%		20-138%
1718-51-0	Terphenyl-d14	61%		17-174%

(a) Elevated RL due to matrix interference.

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:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846 8015B	**Percent Solids:**	80.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12261.D	1	06/16/11	SK	n/a	n/a	GGA665
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)	ND	15	7.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	77%		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

Report of Analysis

Client Sample ID:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	80.1
Project:	Grynberg Deep 4-36		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07264.D	1	06/21/11	JB	06/19/11	OP3900	GFD315
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	17	11	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	81%		61-142%

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:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.1
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	20.8	0.47	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	86.9	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.2	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	10.7	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	20.0	1.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	14.6	5.8	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.11	0.11	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	17.4	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.8	5.8	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.5	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	64.6	3.5	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.78	0.49	mg/kg	1	06/22/11 17:11	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	9.9	1.7	mg/kg	1	06/22/11 17:11	AMA	SW846 3060/7196A M
Redox Potential Vs H2	488		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	80.1		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	5720	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	8.08		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.1
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	345	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	188	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	801	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4967

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 CBD		
Lab Sample ID:	D24307-15A	**Date Sampled:**	06/07/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	80.1
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	8.62		ratio	1	06/18/11 02:22	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG1		
Lab Sample ID:	D24307-16	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	91.4
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	17.2	0.43	mg/kg	5	06/16/11	06/17/11	GJ	SW846 6020 [1]	SW846 3050B [5]
Barium	158	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 1.1	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Chromium	10.0	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Copper	11.4	1.1	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Lead	11.0	5.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.10	0.10	mg/kg	1	06/21/11	06/21/11	JM	SW846 7471A [3]	SW846 7471A [6]
Nickel	11.2	3.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Selenium	< 5.4	5.4	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Silver	< 3.2	3.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]
Zinc	39.9	3.2	mg/kg	1	06/16/11	06/17/11	JY	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA1601
(2) Instrument QC Batch: MA1602
(3) Instrument QC Batch: MA1616
(4) Prep QC Batch: MP4946
(5) Prep QC Batch: MP4947
(6) Prep QC Batch: MP5000

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG1		
Lab Sample ID:	D24307-16	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	91.4
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	0.50	0.44	mg/kg	1	06/22/11 17:11	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	9.5	1.5	mg/kg	1	06/22/11 17:11	AMA	SW846 3060/7196A M
Redox Potential Vs H2	445		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	91.4		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	865	1.0	umhos/cm	1	06/17/11	CJ	DEPT.OF AG, BOOK N9
pH	9.12		su	1	06/13/11 13:00	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG1		
Lab Sample ID:	D24307-16A	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	91.4
Project:	Grynberg Deep 4-36		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	54.9	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	23.4	1.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]
Sodium	103	2.0	mg/l	1	06/17/11	06/18/11	JM	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1604
(2) Prep QC Batch: MP4967

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG1		
Lab Sample ID:	D24307-16A	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	91.4
Project:	Grynberg Deep 4-36		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	2.93		ratio	1	06/18/11 02:42	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG2		
Lab Sample ID:	D24307-17	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	92.3
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	17.3	0.42	mg/kg	5	06/17/11	06/19/11	GJ	SW846 6020 [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA1606
(2) Prep QC Batch: MP4961

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG3		
Lab Sample ID:	D24307-18	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	84.7
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	19.8	0.48	mg/kg	5	06/17/11	06/19/11	GJ	SW846 6020 [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA1606
(2) Prep QC Batch: MP4961

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG4		
Lab Sample ID:	D24307-19	**Date Sampled:**	06/08/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	89.8
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	17.9	0.45	mg/kg	5	06/17/11	06/19/11	GJ	SW846 6020 [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA1606
(2) Prep QC Batch: MP4961

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BG5		
Lab Sample ID:	D24307-20	**Date Sampled:**	06/06/11
Matrix:	SO - Soil	**Date Received:**	06/11/11
		Percent Solids:	90.1
Project:	Grynberg Deep 4-36		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	17.9	0.44	mg/kg	5	06/17/11	06/19/11	GJ	SW846 6020 [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA1606
(2) Prep QC Batch: MP4961

RL = Reporting Limit

Mountain States ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Chain of Custody (Accutest Labs of New England, Inc.)

CHAIN OF CUSTODY

1 of 2

ACCUTEST Laboratories
4036 Youngfield St., Wheat Ridge, CO 80033; 303-425-6021; 303-425-6854

FED-EX Tracking #: | Bottle Order Control #:
Accutest Quote: BS8/2010-41 | Accutest Job #: D24307

Client / Reporting Information

Company Name: son Associates
Project Contact: Dobransky | E-Mail: tdobransky@oaconsulting.com
Address: 21 1/2 Road
City: nd Junction | State: CO | Zip: 81505
Phone No.: -263-7800 | Fax No.:
Sampler's Name: K/TPD

Project Information

Project Name / No.: Grynberg Deep 4-36 (011-0383 100 100001)
Bill to: Olsson Assocaites | Invoice Attn.: Tim Dobransky
Address: 826 21 1/2 Road
City: Grand Junction | State: CO | Zip: 81505
Phone No.: 970-263-7800 | Fax No.:
Client Purchase Order #:

Requested Analyses

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Wastewater; SO - Soil; SL - Sludge; OI - Oil; LIQ - Liquid; SOL - Other Solid

Accutest Sample #	Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	ENCORE	NaHSO4	MEOH	NONE	TPH (GRO)	TPH (DRO)	BTEX	PAH (See List 1)	Electrical Conductivity	Sodium Adsorption Ratio	pH	Metals (See List 2)	LAB USE ONLY
	Deep 4-36 TP-1 (0-1')	6/6/2011	1350	SO	5								X	X	X	X	X	X	X	X	X	01
	Deep 4-36 TP-3 (0-1')	6/6/2011	1410	SO	5								X	X	X	X	X	X	X	X	X	02
	Deep 4-36 TP-8 (0-1')	6/6/2011	1425	SO	5								X	X	X	X	X	X	X	X	X	03
	Deep 4-36 TP-13 (0-1')	6/7/2011	930	SO	5								X	X	X	X	X	X	X	X	X	04
	Deep 4-36 TP-15 (0-1')	6/7/2011	945	SO	5								X	X	X	X	X	X	X	X	X	05
	Deep 4-36 TP-17 (0-1')	6/7/2011	1010	SO	5								X	X	X	X	X	X	X	X	X	06
	Deep 4-36 TP-19 (0-1')	6/7/2011	1025	SO	5								X	X	X	X	X	X	X	X	X	07
	Deep 4-36 TP-24 (0-1')	6/7/2011	1105	SO	5								X	X	X	X	X	X	X	X	X	08
	Deep 4-36 TP-29 (0-1')	6/8/2011	1230	SO	5								X	X	X	X	X	X	X	X	X	09
	Deep 4-36 TP-31 (0-1')	6/8/2011	1245	SO	5								X	X	X	X	X	X	X	X	X	10

Turnaround Time (Business days)

X 10 Day *STANDARD* — Approved By:/ Date:
7 Day (per contract)
4 Day *RUSH*
3 Day *EMERGENCY*
2 Day *EMERGENCY*
1 Day *EMERGENCY*
Other

Real time analytical data available via Lablink

Data Deliverable Information

Commercial "A"
X Commercial "B"
Reduced Tier 1
Full Data Package
TRRP-13
EDD Format
Other

Commercial "A" = Results Only
Commercial "B" = Results & Standard QC

Comments / Remarks

AMS FEDEX Account Number - 467721860

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

JLP 6-11-11

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

Relinquished by Sampler:	Date Time: 6/10/11 1700	Received By: 1	Relinquished By: 2	Date Time:	Received By: 2
Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by:	Date Time:	Received By: 5	Custody Seal #		On Ice: X Cooler Temp. 3.

6/11/11 10:30

CHAIN OF CUSTODY

2 OF 2

ACCUTEST Laboratories
4036 Youngfield St., Wheat Ridge, CO 80033; 303-425-6021; 303-425-6854

FED-EX Tracking # | Bottle Order Control #
Accutest Quote BS8/2010-41 | Accutest Job # D24307

Client / Reporting Information

Company Name: Olsson Associates
Client Contact: Dobransky | E-Mail: tdobransky@gaconsulting.com
Address: 21 1/2 Road
City: Grand Junction | State: CO | Zip: 81505
Phone No.: 263-7800 | Fax No.:
Sampler's Name: K/TPD

Project Information

Project Name / No.: Grynberg Deep 4-36 (011-0383_100_100001)
Bill to: Olsson Assocaites | Invoice Attn.: Tim Dobransky
Address: 826 21 1/2 Road
City: Grand Junction | State: CO | Zip: 81505
Phone No.: 970-263-7800 | Fax No.:
Client Purchase Order #

Requested Analyses

Accutest Sample #	Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	ENCORE	NaHSO4	MEOH	NONE	TPH (GRO)	TPH (DRO)	BTEX	PAH (See List 1)	Electrical Conductivity	Sodium Adsorption Ratio	pH	Metals (See List 2)	Arsenic	LAB USE ONLY
	Deep 4-36 SSW	6/7/2011	1510	SO	5								X	X	X	X	X	X	X	X	X		11
	Deep 4-36 WSW	6/7/2011	1520	SO	5								X	X	X	X	X	X	X	X	X		12
	Deep 4-36 NSW	6/7/2011	1535	SO	5								X	X	X	X	X	X	X	X	X		13
	Deep 4-36 ESW	6/7/2011	1555	SO	5								X	X	X	X	X	X	X	X	X		14
	Deep 4-36 CBD	6/7/2011	1610	SO	5								X	X	X	X	X	X	X	X	X		15
	BG1	6/8/2011	1335	SO	2								X					X	X	X	X		16
	BG2	6/8/2011	1345	SO	1								X									X	17
	BG3	6/8/2011	1355	SO	1								X									X	18
	BG4	6/8/2011	1400	SO	1								X									X	19
	BG5	6/8/2011	1405	SO	1								X									X	20

Matrix Codes
DW - Drinking Water
GW - Ground Water
WW - Wastewater
SO - Soil
SL - Sludge
OI - Oil
LIQ - Liquid
SOL - Other Solid

Turnaround Time (Business days)
[X] 10 Day *STANDARD*
[ ] 7 Day (per contract)
[ ] 4 Day *RUSH*
[ ] 3 Day *EMERGENCY*
[ ] 2 Day *EMERGENCY*
[ ] 1 Day *EMERGENCY*
[ ] Other
Approved By:/ Date:

Real time analytical data available via Lablink

Data Deliverable Information
[ ] Commercial "A"
[X] Commercial "B"
[ ] Reduced Tier 1
[ ] Full Data Package
[ ] TRRP-13
[ ] EDD Format
[ ] Other

Commercial "A" = Results Only
Commercial "B" = Results & Standard QC

Comments / Remarks
AMS FEDEX Account Number - 467721860

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

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

Relinquished by Sampler:	Date Time: 6/10/11 1700	Received By: 1	Relinquished By: 2	Date Time:	Received By: 2
Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by:	Date Time:	Received By: 5	Custody Seal #		On Ice: X Cooler Temp. 3.1

6-15-11 10:30

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D24307 **Client:** OLSSON ASS. **Immediate Client Services Action Required:** No

Date / Time Received: 6/11/2011 10:30:00 AM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: GRYNBERG DEEP 4-36 **Airbill #'s:** Fedex

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021
4036 Youngfield Street
F: (303) 425-6854
Wheat Ridge, CO
www/accutest.com

D24307: Chain of Custody
Page 3 of 3

CHAIN OF CUSTODY

ACCUTEST

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #:	D24307
Accutest Quote #:	0
AMS P.O. #:	
Project No.:	

Client Information			Subcontract Laboratory Information			Analytical Information
Name: Accutest Mountain States (AMS)			Name: Accutest - New England			
Address: 4036 Youngfield St.			Address: 495 Technology Center West, BLDG C			
City: Wheat Ridge,	State: CO	Zip: 80033	City: Marlborough	State: MA	Zip: 01752	
Send Report to: Tiffany Pham			Contact: Sample Management			
Any questions contact: Amanda Kissell						
Phone/Fax #: (303) 425-6021; (303)425-6854			Phone: (508) 481-6200			

Field ID / Point of Collection	Collection Date	Collection Time		Matrix	# of bottles	Preservation HCL	NaOH	HNO3	H2So4	None	XCRA					Comments
D24307 -1	6/6/11	1:50 PM		Soil	1						X					
-2	6/6/11	2:10 PM		Soil	1						X					
-3	6/6/11	2:25 PM		Soil	1						X					
-4	6/7/11	9:30 AM		Soil	1						X					
-5	6/7/11	9:45 AM		Soil	1						X					
-6	6/7/11	10:10 AM		Soil	1						X					
-7	6/7/11	10:25 AM		Soil	1						X					
-8	6/7/11	11:05 AM		Soil	1						X					
-9	6/8/11	12:30 PM		Soil	1						X					
-10	6/8/11	12:45 PM		Soil	1						X					

Turnaround Information

[X] 10 Business Day Standard
[ ] Other _____ (Days)

Approved By:

10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.

Data Deliverable Information

[ ] Commercial "A"
[ ] Commercial "B"
[X] Commercial "BN"
[ ] Reduced Tier 1
[ ] Full Tier 1
[ ] PDF
[ ] Compact Disk Deliverable
[ ] Electronic Delivery:
[ ] State Forms
[ ] Other (Specify)

Comments / Remarks

Please use Colorado regulations and RLs.

18

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date & Time:	Received By:	Date & Time:
1	6/13/11	1 FedEx	1
2 FedEx	6/14/11 10:30	2	2 6/14/11 10:30
3		3	3

For Subcontract Laborartory Use Only

Seal #:
Headspace: Yes [ ] No [ ] NA [ ]
Preserved where applicable: [ ]
Temperature °C 2.1°
On Ice [X]

4.2
4

D24307: Chain of Custody
Page 1 of 3
Accutest Labs of New England, Inc.

CHAIN OF CUSTODY

ACCUTEST

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #:	D24307
Accutest Quote #:	0
AMS P.O. #:	
Project No.:	

Client Information			Subcontract Laboratory Information			Analytical Information
Name: Accutest Mountain States (AMS)			Name: Accutest - New England			
Address: 4036 Youngfield St.			Address: 495 Technology Center West, BLDG C			
City: Wheat Ridge,	State: CO	Zip: 80033	City: Marlborough	State: MA	Zip: 01752	
Send Report to: Tiffany Pham			Contact: Sample Management			
Any questions contact: Amanda Kissell						
Phone/Fax #: (303) 425-6021; (303)425-6854			Phone: (508) 481-6200			

Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles	Preservation HCL	NaOH	HNO3	H2SO4	None	XCRA	Comments
D24307 -11	6/6/11	1:50 PM	Soil	1						X	
-12	6/6/11	2:10 PM	Soil	1						X	
-13	6/6/11	2:25 PM	Soil	1						X	
-14	6/7/11	9:30 AM	Soil	1						X	
-15	6/7/11	9:45 AM	Soil	1						X	
-16	6/7/11	10:10 AM	Soil	1						X	

Turnaround Information

- [X] 10 Business Day Standard
- [ ] Other _____ (Days)

Approved By: _____

10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.

Data Deliverable Information

- [ ] Commercial "A"
- [ ] Commercial "B"
- [X] Commercial "BN"+
- [ ] Reduced Tier 1
- [ ] Full Tier 1
- [ ] PDF
- [ ] Compact Disk Deliverable
- [ ] Electronic Delivery: _____
- [ ] State Forms
- [ ] Other (Specify) _____

Comments / Remarks

Please use Colorado regulations and RLs.

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date & Time:	Received By:	Date & Time:
1	6/13/11	1	1
2		2	2
3		3	3

For Subcontract Laboratory Use Only

Seal #: _____ Headspace: Yes ☐ No ☐ NA ☐

Preserved where applicable: ☐

Temperature °C _____ On Ice ☐

4.2 4

D24307: Chain of Custody
Page 2 of 3

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D24307 **Client:** AMS **Immediate Client Services Action Required:** No

Date / Time Received: 6/14/2011 **Delivery Method:** **Client Service Action Required at Login:** No

Project: **No. Coolers:** 1 **Airbill #'s:**

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservatio	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	☑
2. Trip Blank listed on COC:	☐		☐	☑
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Mountain States ACCUTEST LABORATORIES

06/10/11

Technical Report for

Olsson Associates

011-0382 Grynberg Deep 4-36, Grand Junction,CO

FP

Accutest Job Number: D23840

Sampling Date: 05/25/11

Report to:

Olsson Associates
826 21 1/2 Road
Grand Junction, CO 81505
tdobransky@oaconsulting.com

ATTN: Tim Dobransky

Total number of pages in report: **74**

ACCREDITED IN ACCORDANCE WITH nelac

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.

John Hamilton
Laboratory Director

Client Service contact: 303-425-6021

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

Test results relate only to samples analyzed.

Sections: 1 2 3 4 5 6 7 8 9 10 11 12

Table of Contents

Section 1: Sample Summary **3**
Section 2: Case Narrative/Conformance Summary **4**
Section 3: Sample Results **8**
3.1: D23840-1: DEEP 4-36-FP 9
3.2: D23840-1A: DEEP 4-36-FP 15
Section 4: Misc. Forms **17**
4.1: Chain of Custody 18
Section 5: GC/MS Volatiles - QC Data Summaries **20**
5.1: Method Blank Summary 21
5.2: Blank Spike Summary 22
5.3: Matrix Spike/Matrix Spike Duplicate Summary 23
Section 6: GC/MS Semi-volatiles - QC Data Summaries **24**
6.1: Method Blank Summary 25
6.2: Blank Spike Summary 26
6.3: Matrix Spike/Matrix Spike Duplicate Summary 27
Section 7: GC Volatiles - QC Data Summaries **28**
7.1: Method Blank Summary 29
7.2: Blank Spike Summary 30
7.3: Matrix Spike/Matrix Spike Duplicate Summary 31
Section 8: GC Semi-volatiles - QC Data Summaries **32**
8.1: Method Blank Summary 33
8.2: Blank Spike Summary 34
8.3: Matrix Spike/Matrix Spike Duplicate Summary 35
Section 9: Metals Analysis - QC Data Summaries **36**
9.1: Prep QC MP4820: Hg 37
9.2: Prep QC MP4821: Ba,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn 41
9.3: Prep QC MP4822: As 51
9.4: Prep QC MP4825: Ca,Mg,Na,Sodium Adsorption Ratio 56
Section 10: General Chemistry - QC Data Summaries **64**
10.1: Method Blank and Spike Results Summary 65
10.2: Duplicate Results Summary 66
Section 11: Misc. Forms (Accutest Labs of New England, Inc.) **67**
11.1: Chain of Custody 68
Section 12: General Chemistry - QC Data (Accutest Labs of New England, Inc.) **70**
12.1: Method Blank and Spike Results Summary 71
12.2: Blank Spike Duplicate Results Summary 72
12.3: Duplicate Results Summary 73
12.4: Matrix Spike Results Summary 74

Sample Summary

Olsson Associates

Job No: D23840

011-0382 Grynberg Deep 4-36, Grand Junction, CO
Project No: FP

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D23840-1	05/25/11	14:15	JK	05/27/11	SO	Soil	DEEP 4-36-FP
D23840-1A	05/25/11	14:15	JK	05/27/11	SO	Soil	DEEP 4-36-FP

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Olsson Associates	**Job No**	D23840
Site:	011-0382 Grynberg Deep 4-36, Grand Junction,CO	**Report Dat**	6/10/2011 11:29:38 AM

On 05/27/2011, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.3 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D23840 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:** V3V672

- All samples were analyzed within the recommended method holding time.
- Sample(s) D23840-1MS, D23840-1MSD 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:** OP3757

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D23855-5MS, D23855-5MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike and matrix spike duplicate (MS/MSD) recovery(s) of multiple analytes are outside control limits. Outside control limits due to possible matrix interference.
- The RPD(s) for the MS and MSD recoveries of Acenaphthene, Anthracene, Benzo(a)anthracene, Fluoranthene, Naphthalene, Pyrene are outside control limits for sample OP3757-MSD. High RPD due to possible sample nonhomogeneity.

Volatiles by GC By Method SW846 8015B

Matrix SO **Batch ID:** GGB628

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D23855-1MS, D23855-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

Matrix SO **Batch ID:** OP3790

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D23984-1MS, D23984-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Probable cause due to the ratio of spike to sample concentration < 4.

Metals By Method SW846 6010B

Matrix	AQ	Batch ID:	MP4825

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D23840-1AMS, D23840-1AMSD were used as the QC samples for the metals analysis.

Matrix	SO	Batch ID:	MP4821

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D23855-5MS, D23855-5MSD, D23855-5SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Zinc are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- The matrix spike and matrix spike duplicate (MS/MSD) 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 Zinc are outside control limits for sample MP4821-S2. High RPD due to possible sample nonhomogeneity.
- The serial dilution RPD(s) for Cadmium, Selenium, Silver are outside control limits for sample MP4821-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- The serial dilution RPD(s) for Barium, Chromium, Nickel, Zinc are outside control limits for sample MP4821-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

Matrix	SO	Batch ID:	MP4822

- 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) D23855-5MS, D23855-5MSD, D23855-5SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471A

Matrix	SO	Batch ID:	MP4820

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D23862-1MS, D23862-1MSD were used as the QC samples for the metals analysis.
- The matrix spike and matrix spike duplicate (MS/MSD) recovery(s) of Mercury are outside control limits. Probable cause due to matrix interference.

Wet Chemistry By Method ASTM D1498-76M

Matrix	SO	Batch ID:	GN9752

- Sample(s) D23840-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

Wet Chemistry By Method SM19 2540B M

Matrix	SO	Batch ID:	GN9781

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

Wet Chemistry By Method SW846 3060/7196A M

Matrix	SO	Batch ID:	R7742

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

Wet Chemistry By Method SW846 3060A/7196A

Matrix	SO	Batch ID:	M:GP13041

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SW846 9045C

Matrix	SO	Batch ID:	GN9748

- The following sample was run outside of holding time for method SW846 9045C: D23840-1.

Wet Chemistry By Method USDA HANDBOOK 60

Matrix	SO	Batch ID:	MP4825

- Sodium Adsorption Ratio: Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+(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.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client:	Accutest Mountain States	**Job No**	D23840
Site:	CORCCOGJ: 011-0382 Grynberg Deep 4-36, Grand Junction,CO	**Report Date**	6/8/2011 9:33:14 AM

1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 05/25/2011 and were received at Accutest on 05/27/2011 properly preserved, at XXXXNO TEMPERATURE FOUNDXXXX Deg. C and intact. These Samples received an Accutest job number of D23840. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO **Batch ID:** GP13041

- All samples were distilled 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) D23840-1MS, D23840-1DUP were used as the QC samples for Chromium, Hexavalent.
- RPD(s) for Duplicate for Chromium, Hexavalent are outside control limits for sample GP13041-D1. RPD acceptable due to low duplicate and sample concentrations.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety.The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D23840).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	DEEP 4-36-FP		
Lab Sample ID:	D23840-1	**Date Sampled:**	05/25/11
Matrix:	SO - Soil	**Date Received:**	05/27/11
Method:	SW846 8260B	**Percent Solids:**	73.2
Project:	011-0382 Grynberg Deep 4-36, Grand Junction, CO		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V11939.D	1	06/06/11	DC	n/a	n/a	V3V672
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.12 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	85	37	ug/kg	
108-88-3	Toluene	ND	170	85	ug/kg	
100-41-4	Ethylbenzene	ND	170	42	ug/kg	
1330-20-7	Xylene (total)	107	340	85	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	77%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%
17060-07-0	1,2-Dichloroethane-D4	95%		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:	DEEP 4-36-FP		
Lab Sample ID:	D23840-1	**Date Sampled:**	05/25/11
Matrix:	SO - Soil	**Date Received:**	05/27/11
Method:	SW846 8270C BY SIM SW846 3546	**Percent Solids:**	73.2
Project:	011-0382 Grynberg Deep 4-36, Grand Junction, CO		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G04236.D	1	06/02/11	EH	05/31/11	OP3757	E3G158
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	9.1	7.3	ug/kg	
120-12-7	Anthracene	ND	9.1	8.2	ug/kg	
56-55-3	Benzo(a)anthracene	ND	23	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	23	16	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	23	17	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	23	10	ug/kg	
218-01-9	Chrysene	ND	23	10	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	23	17	ug/kg	
206-44-0	Fluoranthene	ND	9.1	9.1	ug/kg	
86-73-7	Fluorene	ND	9.1	7.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	27	25	ug/kg	
91-20-3	Naphthalene	ND	9.1	8.7	ug/kg	
129-00-0	Pyrene	ND	9.1	8.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	71%		10-193%
321-60-8	2-Fluorobiphenyl	66%		20-138%
1718-51-0	Terphenyl-d14	71%		17-174%

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:	DEEP 4-36-FP		
Lab Sample ID:	D23840-1	**Date Sampled:**	05/25/11
Matrix:	SO - Soil	**Date Received:**	05/27/11
Method:	SW846 8015B	**Percent Solids:**	73.2
Project:	011-0382 Grynberg Deep 4-36, Grand Junction, CO		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB10851.D	1	05/28/11	BR	n/a	n/a	GGB628
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.2 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	14.6	17	8.4	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	118%		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

Report of Analysis

Client Sample ID:	DEEP 4-36-FP		
Lab Sample ID:	D23840-1	**Date Sampled:**	05/25/11
Matrix:	SO - Soil	**Date Received:**	05/27/11
Method:	SW846-8015B SW846 3546	**Percent Solids:**	73.2
Project:	011-0382 Grynberg Deep 4-36, Grand Junction, CO		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI02493.D	1	06/04/11	JB	06/03/11	OP3790	GFI158
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	18	12	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	95%		61-142%

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: DEEP 4-36-FP
Lab Sample ID: D23840-1
Matrix: SO - Soil
Project: 011-0382 Grynberg Deep 4-36, Grand Junction, CO

Date Sampled: 05/25/11
Date Received: 05/27/11
Percent Solids: 73.2

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	18.6	0.51	mg/kg	5	05/31/11	05/31/11	JM	SW846 6020 [3]	SW846 3050B [6]
Barium	133	1.3	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Cadmium	< 1.3	1.3	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Chromium	13.8	1.3	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Copper	17.3	1.3	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Lead	12.5	6.3	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Mercury	< 0.12	0.12	mg/kg	1	05/31/11	05/31/11	JM	SW846 7471A [1]	SW846 7471A [4]
Nickel	15.5	3.8	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Selenium	< 6.3	6.3	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Silver	< 3.8	3.8	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]
Zinc	56.1	3.8	mg/kg	1	05/31/11	05/31/11	GJ	SW846 6010B [2]	SW846 3050B [5]

(1) Instrument QC Batch: MA1558
(2) Instrument QC Batch: MA1559
(3) Instrument QC Batch: MA1560
(4) Prep QC Batch: MP4820
(5) Prep QC Batch: MP4821
(6) Prep QC Batch: MP4822

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36-FP		
Lab Sample ID:	D23840-1	**Date Sampled:**	05/25/11
Matrix:	SO - Soil	**Date Received:**	05/27/11
		Percent Solids:	73.2
Project:	011-0382 Grynberg Deep 4-36, Grand Junction, CO		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent [a]	< 0.54	0.54	mg/kg	1	06/03/11 17:20	AMA	SW846 3060A/7196A
Chromium, Trivalent [b]	13.3	1.8	mg/kg	1	06/03/11 17:20	AMA	SW846 3060/7196A M
Redox Potential Vs H2	469		mv	1	05/27/11	JD	ASTM D1498-76M
Solids, Percent	73.2		%	1	06/01/11	SWT	SM19 2540B M
Specific Conductivity	2320	1.0	umhos/cm	1	05/31/11	JD	DEPT.OF AG, BOOK N9
pH	8.47		su	1	05/27/11 14:45	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: DEEP 4-36-FP
Lab Sample ID: D23840-1A
Matrix: SO - Soil
Project: 011-0382 Grynberg Deep 4-36, Grand Junction, CO

Date Sampled: 05/25/11
Date Received: 05/27/11
Percent Solids: 73.2

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	234	2.0	mg/l	1	05/31/11	05/31/11	GJ	SW846 6010B [1]	EPA 200.7 [2]
Magnesium	77.6	1.0	mg/l	1	05/31/11	05/31/11	GJ	SW846 6010B [1]	EPA 200.7 [2]
Sodium	221	2.0	mg/l	1	05/31/11	05/31/11	GJ	SW846 6010B [1]	EPA 200.7 [2]

(1) Instrument QC Batch: MA1559
(2) Prep QC Batch: MP4825

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36-FP		
Lab Sample ID:	D23840-1A	**Date Sampled:**	05/25/11
Matrix:	SO - Soil	**Date Received:**	05/27/11
		Percent Solids:	73.2
Project:	011-0382 Grynberg Deep 4-36, Grand Junction, CO		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio [a]	3.20		ratio	1	05/31/11 19:35	GJ	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Mountain States ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

ACCUTEST Laboratories

4036 Youngfield St., Wheat Ridge, CO 80033; 303-425-6021; 303-425-6854

FED-EX Tracking #

Bottle Order Control #

Accutest Quote BS8/2010-41

Accutest Job # D23840

Client / Reporting Information

Company Name: Olsson Associates

Project Contact: Tim Dobransky

E-Mail: tdobransky@oaconsulting.com

Address: 826 21 1/2 Road

City: Grand Junction State: CO Zip: 81505

Phone No.: 970-263-7800 Fax No.: 970-263-7456

Samplers's Name: Jarrod Kent

Project Information

Project Name / No.: 011-0382 Grynberg Deep 4-36

Bill to: Olsson Assocaites Invoice Attn.: Tim Dobransky

Address: 826 21 1/2 Road

City: Grand Junction State: CO Zip: 81505

Phone No.: 970-263-7800 Fax No.: 970-263-7456

Client Purchase Order #

Requested Analyses

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Wastewater
SO - Soil
SL - Sludge
OI - Oil
LIQ - Liquid
SOL - Other Solid

Accutest Sample #	Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	EnCore	NaHSO	MeOH	NONE	TPH (GRO)	TPH (DRO)	BTEX	PAH (See List 1)	Electrical Conductivity	Sodium Adsorption Ratio	pH	Metals (See List 2)	LAB USE ONLY
	Deep 4-36-FP	5/25/2011	1415	SO	3								x	x	x	x	x	x	x	x	x	01 TK

Turnaround Time (Business days)

- [X] 10 Day *STANDARD*
- [ ] 7 Day (per contract)
- [ ] 4 Day *RUSH*
- [ ] 3 Day *EMERGENCY*
- [ ] 2 Day *EMERGENCY*
- [ ] 1 Day *EMERGENCY*
- [ ] Other

Approved By:/ Date:

Real time analytical data available via Lablink

Data Deliverable Information

- [ ] Commercial "A"
- [X] Commercial "B"
- [ ] Reduced Tier 1
- [ ] Full Data Package
- [ ] TRRP-13
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only

Commercial "B" = Results & Standard QC

Comments / Remarks

AMS FEDEX Account Number - 467721860

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

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

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		5/26/11 1700	1	2		2
	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3			3	4		4
	Relinquished by:	Date Time:	Received By:	Custody Seal #	On Ice	Cooler Temp.
5			5			4.3°

Fedex

4.1 4

D23840: Chain of Custody

Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D23840 **Client:** OLSSON ASS. **Immediate Client Services Action Required:** No

Date / Time Received: 5/27/2011 8:45:00 AM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: 011-083 GRYNBERG DEEP 4-36 **Airbill #'s:** Fedex

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www/accutest.com

D23840: Chain of Custody
Page 2 of 2

Mountain States ACCUTEST LABORATORIES

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V672-MB1	3V11937.D	1	06/06/11	DC	n/a	n/a	V3V672

The QC reported here applies to the following samples: **Method:** SW846 8260B

D23840-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	22	ug/kg	
100-41-4	Ethylbenzene	ND	100	25	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylene (total)	ND	200	50	ug/kg	

CAS No.	Surrogate Recoveries		Limits
2037-26-5	Toluene-D8	81%	70-130%
460-00-4	4-Bromofluorobenzene	79%	70-130%
17060-07-0	1,2-Dichloroethane-D4	94%	70-130%

Blank Spike Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V672-BS1	3V11938.D	1	06/06/11	DC	n/a	n/a	V3V672

The QC reported here applies to the following samples: **Method:** SW846 8260B

D23840-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	47.1	94	68-130
100-41-4	Ethylbenzene	50	49.0	98	70-130
108-88-3	Toluene	50	46.4	93	70-130
1330-20-7	Xylene (total)	100	90.0	90	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	81%	70-130%
460-00-4	4-Bromofluorobenzene	84%	70-130%
17060-07-0	1,2-Dichloroethane-D4	86%	70-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D23840-1MS	3V11940.D	1	06/06/11	DC	n/a	n/a	V3V672
D23840-1MSD	3V11941.D	1	06/06/11	DC	n/a	n/a	V3V672
D23840-1	3V11939.D	1	06/06/11	DC	n/a	n/a	V3V672

The QC reported here applies to the following samples: **Method:** SW846 8260B

D23840-1

CAS No.	Compound	D23840-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		4250	4000	94	3970	93	1	55-140/30
100-41-4	Ethylbenzene	ND		4250	4140	97	4110	97	1	56-139/30
108-88-3	Toluene	ND		4250	3960	93	3780	89	5	57-144/30
1330-20-7	Xylene (total)	107	J	8500	7770	90	7700	89	1	51-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D23840-1	Limits
2037-26-5	Toluene-D8	79%	78%	77%	70-130%
460-00-4	4-Bromofluorobenzene	83%	87%	82%	70-130%
17060-07-0	1,2-Dichloroethane-D4	88%	93%	95%	70-130%

Mountain States ACCUTEST LABORATORIES

GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3757-MB	3G04230.D	1	06/01/11	EH	05/31/11	OP3757	E3G158

The QC reported here applies to the following samples: **Method:** SW846 8270C BY SIM

D23840-1

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	6.7	5.3	ug/kg	
120-12-7	Anthracene	ND	6.7	6.0	ug/kg	
56-55-3	Benzo(a)anthracene	ND	17	8.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	17	12	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	17	12	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	17	7.3	ug/kg	
218-01-9	Chrysene	ND	17	7.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	17	12	ug/kg	
206-44-0	Fluoranthene	ND	6.7	6.7	ug/kg	
86-73-7	Fluorene	ND	6.7	5.7	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	20	18	ug/kg	
91-20-3	Naphthalene	ND	6.7	6.3	ug/kg	
129-00-0	Pyrene	ND	6.7	6.3	ug/kg	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	75%	10-193%
321-60-8	2-Fluorobiphenyl	73%	20-138%
1718-51-0	Terphenyl-d14	87%	17-174%

Blank Spike Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3757-BS	3G04231.D	1	06/01/11	EH	05/31/11	OP3757	E3G158

The QC reported here applies to the following samples: **Method:** SW846 8270C BY SIM

D23840-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	40.0	48	40-136
120-12-7	Anthracene	83.3	50.2	60	40-141
56-55-3	Benzo(a)anthracene	83.3	74.7	90	38-143
50-32-8	Benzo(a)pyrene	83.3	73.6	88	39-145
205-99-2	Benzo(b)fluoranthene	83.3	71.7	86	38-151
207-08-9	Benzo(k)fluoranthene	83.3	70.6	85	38-147
218-01-9	Chrysene	83.3	67.3	81	39-137
53-70-3	Dibenzo(a,h)anthracene	83.3	74.5	89	35-139
206-44-0	Fluoranthene	83.3	50.9	61	34-132
86-73-7	Fluorene	83.3	42.1	51	41-136
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	73.9	89	31-144
91-20-3	Naphthalene	83.3	38.9	47	36-130
129-00-0	Pyrene	83.3	55.1	66	29-157

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	47%	10-193%
321-60-8	2-Fluorobiphenyl	45%	20-138%
1718-51-0	Terphenyl-d14	77%	17-174%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3757-MS	3G04246.D	10	06/02/11	EH	05/31/11	OP3757	E3G159
OP3757-MSD	3G04247.D	10	06/02/11	EH	05/31/11	OP3757	E3G159
D23855-5 [a]	3G04245.D	10	06/02/11	EH	05/31/11	OP3757	E3G159

The QC reported here applies to the following samples: **Method:** SW846 8270C BY SIM

D23840-1

CAS No.	Compound	D23855-5 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		95.5	ND	0* [b]	69.7	73	200* [c]	20-151/30
120-12-7	Anthracene	ND		95.5	ND	0* [b]	83.7	88	200* [c]	25-149/30
56-55-3	Benzo(a)anthracene	ND		95.5	ND	0* [b]	109	114	200* [c]	22-157/30
50-32-8	Benzo(a)pyrene	ND		95.5	ND	0* [b]	ND	0* [b]	nc	23-153/30
205-99-2	Benzo(b)fluoranthene	ND		95.5	ND	0* [b]	ND	0* [b]	nc	22-161/30
207-08-9	Benzo(k)fluoranthene	ND		95.5	ND	0* [b]	ND	0* [b]	nc	17-161/30
218-01-9	Chrysene	ND		95.5	ND	0* [b]	ND	0* [b]	nc	16-159/30
53-70-3	Dibenzo(a,h)anthracene	ND		95.5	ND	0* [b]	ND	0* [b]	nc	21-154/30
206-44-0	Fluoranthene	ND		95.5	ND	0* [b]	99.5	105	200* [c]	16-140/30
86-73-7	Fluorene	ND		95.5	72.2	76	97.0	102	29	15-153/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		95.5	ND	0* [b]	ND	0* [b]	nc	21-159/30
91-20-3	Naphthalene	105		95.5	136	32	199	99	38* [c]	10-176/30
129-00-0	Pyrene	ND		95.5	78.5	82	112	118	35* [c]	10-200/30

CAS No.	Surrogate Recoveries	MS	MSD	D23855-5	Limits
4165-60-0	Nitrobenzene-d5	48%	54%	53%	10-193%
321-60-8	2-Fluorobiphenyl	39%	47%	49%	20-138%
1718-51-0	Terphenyl-d14	52%	74%	65%	17-174%

(a) Elevated RL due to matrix interference.
(b) Outside control limits due to possible matrix interference.
(c) High RPD due to possible sample nonhomogeneity.

Mountain States ACCUTEST LABORATORIES

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB628-MB	GB10831.D	1	05/27/11	BR	n/a	n/a	GGB628

The QC reported here applies to the following samples: **Method:** SW846 8015B

D23840-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries		Limits
120-82-1	1,2,4-Trichlorobenzene	102%	60-140%

Blank Spike Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB628-BS	GB10832.D	1	05/27/11	BR	n/a	n/a	GGB628

The QC reported here applies to the following samples: **Method:** SW846 8015B

D23840-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	104	95	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	108%	60-140%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D23855-1MS	GB10834.D	1	05/27/11	BR	n/a	n/a	GGB628
D23855-1MSD	GB10835.D	1	05/27/11	BR	n/a	n/a	GGB628
D23855-1	GB10833.D	1	05/27/11	BR	n/a	n/a	GGB628

The QC reported here applies to the following samples: **Method:** SW846 8015B

D23840-1

CAS No.	Compound	D23855-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	20.2		150	154	89	150	87	3	62-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D23855-1	Limits
120-82-1	1,2,4-Trichlorobenzene	97%	101%	95%	60-140%

Mountain States ACCUTEST LABORATORIES

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3790-MB	FI02483.D	1	06/04/11	JB	06/03/11	OP3790	GFI158

The QC reported here applies to the following samples: **Method:** SW846-8015B

D23840-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	13	8.7	mg/kg	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	100%	61-142%

Blank Spike Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3790-BS	FI02484.D	1	06/04/11	JB	06/03/11	OP3790	GFI158

The QC reported here applies to the following samples: **Method:** SW846-8015B

D23840-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	588	88	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	103%	61-142%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D23840
Account: CORCCOGJ Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3790-MS	FI02485.D	5	06/04/11	JB	06/03/11	OP3790	GFI158
OP3790-MSD	FI02486.D	5	06/04/11	JB	06/03/11	OP3790	GFI158
D23984-1	FI02487.D	5	06/04/11	JB	06/03/11	OP3790	GFI158

The QC reported here applies to the following samples: **Method:** SW846-8015B

D23840-1

CAS No.	Compound	D23984-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	4080		674	3040	-154* [a]	2700	-205* [a]	12	24-157/35

CAS No.	Surrogate Recoveries	MS	MSD	D23984-1	Limits
84-15-1	o-Terphenyl	84%	85%	92%	61-142%

(a) Outside control limits due to possible matrix interference.

8.3.1

8

Mountain States ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4820
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 05/31/11

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.10	.0011	.013	0.00031	<0.10

Associated samples MP4820: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4820
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 05/31/11

Metal	D23862-1 Original	MS	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.014	0.56	0.459	119.0	85-115

Associated samples MP4820: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4820 Methods: SW846 7471A
Matrix Type: SOLID Units: mg/kg

Prep Date: 05/31/11

Metal	D23862-1 Original	MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.014	0.51	0.41	120.9N(a	9.3	20

Associated samples MP4820: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4820
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 05/31/11

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.45	0.4	112.5	80-120

Associated samples MP4820: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 05/31/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.59	.59		
Antimony	3.0	.31	.31		
Arsenic	2.5	.59	.59		
Barium	1.0	.11	.11	0.010	<1.0
Beryllium	1.0	.044	.1		
Boron	5.0	.48	.48		
Cadmium	1.0	.027	.27	0.030	<1.0
Calcium	40	.96	1.1		
Chromium	1.0	.018	.031	0.020	<1.0
Cobalt	0.50	.035	.035		
Copper	1.0	.085	.16	-0.090	<1.0
Iron	7.0	.34	2		
Lead	5.0	.16	.21	0.080	<5.0
Lithium	0.20	.028	.031		
Magnesium	20	.58	1.4		
Manganese	0.50	.0053	.012		
Molybdenum	1.0	.045	.054		
Nickel	3.0	.043	.099	0.030	<3.0
Phosphorus	10	1.1	1.2		
Potassium	200	5.5	9.2		
Selenium	5.0	.38	.5	0.28	<5.0
Silicon	5.0	.38	.51		
Silver	3.0	.018	.051	-0.020	<3.0
Sodium	40	11	11		
Strontium	5.0		.017		
Thallium	1.0	.29	.34		
Tin	5.0	.55	1.3		
Titanium	1.0	.011	.1		
Uranium	5.0	.15	.2		
Vanadium	1.0	.016	.025		
Zinc	3.0	.028	.06	0.070	<3.0

Associated samples MP4821: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 05/31/11

Metal	D23855-5 Original	MS	Spikelot MPICPALL	% Rec	QC Limits
Aluminum					
Antimony	anr				
Arsenic	anr				
Barium	2480	3160	216	314.6(a)	75-125
Beryllium	anr				
Boron					
Cadmium	0.88	47.3	54	85.9	75-125
Calcium	anr				
Chromium	24.2	66.0	54	77.4	75-125
Cobalt					
Copper	19.3	67.6	54	89.4	75-125
Iron					
Lead	13.7	101	108	80.8	75-125
Lithium					
Magnesium	anr				
Manganese					
Molybdenum					
Nickel	17.7	58.9	54	76.3	75-125
Phosphorus					
Potassium					
Selenium	3.6	94.9	108	84.5	75-125
Silicon					
Silver	0.056	18.6	21.6	85.8	75-125
Sodium					
Strontium					
Thallium	anr				
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	50.4	87.3	54	68.3N(b)	75-125

Associated samples MP4821: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
(b) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 05/31/11

Metal	D23855-5 Original	MSD	Spikelot MPICPALL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	anr					
Arsenic	anr					
Barium	2480	3180	222	314.7(a)	0.6	20
Beryllium	anr					
Boron						
Cadmium	0.88	49.3	55.6	87.1	4.1	20
Calcium	anr					
Chromium	24.2	70.2	55.6	82.7	6.2	20
Cobalt						
Copper	19.3	71.1	55.6	93.2	5.0	20
Iron						
Lead	13.7	105	111	82.1	3.9	20
Lithium						
Magnesium	anr					
Manganese						
Molybdenum						
Nickel	17.7	64.6	55.6	84.3	9.2	20
Phosphorus						
Potassium						
Selenium	3.6	98.6	111	85.4	3.8	20
Silicon						
Silver	0.056	19.4	22.2	87.0	4.2	20
Sodium						
Strontium						
Thallium	anr					
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	50.4	107	55.6	101.8	20.3 (b)	20

Associated samples MP4821: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821 Methods: SW846 6010B
Matrix Type: SOLID Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
(b) High RPD due to possible sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 05/31/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony	anr			
Arsenic	anr			
Barium	176	200	88.0	80-120
Beryllium	anr			
Boron				
Cadmium	46.2	50	92.4	80-120
Calcium	anr			
Chromium	46.3	50	92.6	80-120
Cobalt				
Copper	46.6	50	93.2	80-120
Iron				
Lead	92.3	100	92.3	80-120
Lithium				
Magnesium	anr			
Manganese				
Molybdenum				
Nickel	46.0	50	92.0	80-120
Phosphorus				
Potassium				
Selenium	90.2	100	90.2	80-120
Silicon				
Silver	18.5	20	92.5	80-120
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	44.1	50	88.2	80-120

Associated samples MP4821: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date: 05/31/11

Metal	D23855-5 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	anr			
Arsenic	anr			
Barium	22300	24900	11.4*(a)	0-10
Beryllium	anr			
Boron				
Cadmium	7.90	6.50	17.7 (b)	0-10
Calcium	anr			
Chromium	218	245	12.2*(a)	0-10
Cobalt				
Copper	174	170	2.1	0-10
Iron				
Lead	124	132	6.5	0-10
Lithium				
Magnesium	anr			
Manganese				
Molybdenum				
Nickel	160	185	16.0*(a)	0-10
Phosphorus				
Potassium				
Selenium	32.0	0.00	100.0(b)	0-10
Silicon				
Silver	0.500	2.50	400.0(b)	0-10
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	453	551	21.5*(a)	0-10

Associated samples MP4821: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4821
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.
(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4822
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 05/31/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.2		
Antimony	0.20	.001	.0095		
Arsenic	0.40	.049	.22	0.0013	<0.40
Barium	1.0	.0035	.1		
Beryllium	0.10	.0075	.014		
Boron	20	.97	1		
Cadmium	0.050	.023	.048		
Calcium	200	1.8	8.2		
Chromium	1.0	.021	.24		
Cobalt	0.10	.0033	.003		
Copper	1.0	.011	.063		
Iron	20	.81	3.7		
Lead	0.25	.0012	.015		
Magnesium	50	.067	2.6		
Manganese	0.50	.007	.029		
Molybdenum	0.50	.0044	.023		
Nickel	1.0	.0029	.031		
Phosphorus	30	1.8	3.5		
Potassium	100	2	3.2		
Selenium	0.20	.075	.19		
Silver	0.050	.0008	.002		
Sodium	250	.8	4.4		
Strontium	10	.004	.04		
Thallium	0.10	.015	.02		
Tin	5.0	.006	.028		
Titanium	1.0	.035	.062		
Uranium	0.25	.00038	.0009		
Vanadium	2.0	.052	.29		
Zinc	5.0	.039	.12		

Associated samples MP4822: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4822
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 05/31/11

Metal	D23855-5 Original	MS	Spikelot MPICPALL	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	8.5	118	108	101.3	60-119
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP4822: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4822 Methods: SW846 6020
Matrix Type: SOLID Units: mg/kg

Prep Date: 05/31/11

Metal	D23855-5 Original	MSD	Spikelot MPICPALL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	8.5	123	111	103.0	4.1	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP4822: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4822
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 05/31/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	99.7	100	99.7	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP4822: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4822
Matrix Type: SOLID

Methods: SW846 6020
Units: ug/l

Prep Date: 05/31/11

Metal	D23855-5 Original	SDL 5:25	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	76.5	83.7	9.4	0-10
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP4822: D23840-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date: 05/31/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	30	30		
Antimony	150	16	16		
Arsenic	130	30	30		
Barium	50	5.5	5.5		
Beryllium	50	2.2	2.5		
Boron	250	24	24		
Cadmium	50	1.4	1.4		
Calcium	2000	48	75	12.0	<2000
Chromium	50	.9	4		
Cobalt	25	1.8	1.8		
Copper	50	4.3	14		
Iron	350	17	65		
Lead	250	8	11		
Lithium	10	1.4	6		
Magnesium	1000	29	50	19.5	<1000
Manganese	25	.27	1.6		
Molybdenum	50	2.3	4.4		
Nickel	150	2.2	5		
Phosphorus	500	55	100		
Potassium	5000	280	280		
Selenium	250	19	19		
Silicon	250	19	19		
Silver	150	.9	1.6		
Sodium	2000	570	570	593	<2000
Strontium	25		1.3		
Thallium	50	15	15		
Tin	250	28	50		
Titanium	50	.55	1.6		
Uranium	250	7.5	18		
Vanadium	50	.8	1.1		
Zinc	150	1.4	9		

Associated samples MP4825: D23840-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date: 05/31/11

Metal	D23840-1A Original MS		Spikelot MPICPALL	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	234000	362000	125000	102.4	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	77600	202000	125000	99.5	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	221000	343000	125000	97.6	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP4825: D23840-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date: 05/31/11

Metal	D23840-1A Original	MSD	Spikelot MPICPALL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	234000	375000	125000	112.8	3.5	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	77600	206000	125000	102.7	2.0	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	221000	354000	125000	106.4	3.2	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP4825: D23840-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date: 05/31/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	135000	125000	108.0	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	126000	125000	100.8	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	127000	125000	101.6	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP4825: D23840-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

QC Batch ID: MP4825
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

Mountain States ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP4551/GN9765			umhos/cm	9961	9800	98.4	90-110%
pH	GN9748			su	8.00	7.97	99.8	99.3-100.7%

Associated Samples:
Batch GN9748: D23840-1
Batch GP4551: D23840-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D23840
Account: CORCCOGJ - Olsson Associates
Project: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Redox Potential Vs H2	GN9752	D23840-1	mv	469	475	1.3	0-20%

Associated Samples:
Batch GN9752: D23840-1
(*) Outside of QC limits

Mountain States ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

ACCUTEST

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #:	D23840
Accutest Quote #:	
AMS P.O. #:	
Project No.:	

Client Information			Subcontract Laboratory Information			Analytical Information
Name: Accutest Mountain States (AMS)			Name: Accutest - New England			
Address: 4036 Youngfield St.			Address: 495 Technology Center West, BLDG C			
City: Wheat Ridge,	State: CO	Zip: 80033	City: Marlborough	State: MA	Zip: 01752	
Send Report to: Tiffany Pham			Contact: Sample Management			
Any questions contact: Amanda Kissell						
Phone/Fax #: (303) 425-6021; (303)425-6854			Phone: (508) 481-6200			

Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles	Preservation HCL	NaOH	HNO3	H2SO4	None	XCRA	Comments
D23840 -1	5/25/11	2:15 PM	Soil	1						X	
-											
-											

Turnaround Information

- [X] 10 Business Day Standard — Approved By:
- [ ] Other _____ (Days)

10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.

Data Deliverable Information

- [ ] Commercial "A"
- [ ] Commercial "B"
- [X] Commercial "BN"
- [ ] Reduced Tier 1
- [ ] Full Tier 1
- [ ] PDF
- [ ] Compact Disk Deliverable
- [ ] Electronic Delivery:
- [ ] State Forms
- [ ] Other (Specify)

Comments / Remarks

Please use Colorado regulations and RLs.

14D

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by:	Date & Time:	Received By:	Date & Time:
1		5/27/11	1	1
2	FED	5-28-11 11:45	2	2
3			3	3

For Subcontract Laborartory Use Only

Seal #:

Headspace: Yes ☐ No ☐ NA ☐

Preserved where applicable: ☐

Temperature °C 2.1 °C

On Ice ☑

11.1 11

D23840: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D23840 **Client:** AMS **Immediate Client Services Action Required:** No

Date / Time Received: 5/28/2011 **Delivery Method:** **Client Service Action Required at Login:** No

Project: **No. Coolers:** 1 **Airbill #'s:**

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservatio	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	☑
2. Trip Blank listed on COC:	☐		☐	☑
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Mountain States ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D23840
Account: ALMS - Accutest Mountain States
Project: CORCCOGJ: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP13041/GN35086	0.40	0.0	mg/kg	12	12.4	103.3	80-120%
Chromium, Hexavalent	GP13041/GN35086			mg/kg	837	838	100.1	80-120%

Associated Samples:
Batch GP13041: D23840-1
(*) Outside of QC limits

BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D23840
Account: ALMS - Accutest Mountain States
Project: CORCCOGJ: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Analyte	Batch ID	Units	Spike Amount	BSD Result	RPD	QC Limit
Chromium, Hexavalent	GP13041/GN35086	mg/kg	12	11.9	5.0	

Associated Samples:
Batch GP13041: D23840-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D23840
Account: ALMS - Accutest Mountain States
Project: CORCCOGJ: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP13041/GN35086	D23840-1	mg/kg	0.48	0.74	42.6(a)	0-20%

Associated Samples:
Batch GP13041: D23840-1
(*) Outside of QC limits
(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D23840
Account: ALMS - Accutest Mountain States
Project: CORCCOGJ: 011-0382 Grynberg Deep 4-36, Grand Junction,CO

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP13041/GN35086	D23840-1	mg/kg	0.48	16.4	13.7	80.6	75-125%
Chromium, Hexavalent	GP13041/GN35086	D23840-1	mg/kg	0.48	1010	978	96.6	75-125%

Associated Samples:
Batch GP13041: D23840-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

Mountain States ACCUTEST LABORATORIES

07/05/11

Technical Report for

Olsson Associates

Hiawatha

Deep 4-36 011-0383

Accutest Job Number: D24914

Sampling Date: 06/28/11

Report to:

Olsson Associates
826 21 1/2 Road
Grand Junction, CO 81505
tdobransky@oaconsulting.com

ATTN: Tim Dobransky

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

ACCREDITED IN ACCORDANCE WITH nelac

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.

John Hamilton
Laboratory Director

Client Service contact: 303-425-6021

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

Test results relate only to samples analyzed.

Sections: 1 2 3 4 5

Table of Contents

Section 1: Sample Summary **3**
Section 2: Case Narrative/Conformance Summary **4**
Section 3: Sample Results **5**
3.1: D24914-1: DEEP 4-36 BG6 6
3.2: D24914-2: DEEP 4-36 BG7 7
3.3: D24914-3: DEEP 4-36 BG8 8
Section 4: Misc. Forms **9**
4.1: Chain of Custody 10
Section 5: Metals Analysis - QC Data Summaries **12**
5.1: Prep QC MP5099: As 13

Sample Summary

Olsson Associates

Job No: D24914

Hiawatha
Project No: Deep 4-36 011-0383

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D24914-1	06/28/11	10:40	JPK	06/29/11	SO	Soil	DEEP 4-36 BG6
D24914-2	06/28/11	11:05	JPK	06/29/11	SO	Soil	DEEP 4-36 BG7
D24914-3	06/28/11	11:30	JPK	06/29/11	SO	Soil	DEEP 4-36 BG8

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Olsson Associates	**Job No**	D24914
Site:	Hiawatha	**Report Dat**	7/5/2011 2:51:42 PM

On 06/29/2011, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D24914 was assigned to the project. The lab sample IDs, client sample IDs, and dates 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.

Metals By Method SW846 6020

Matrix SO **Batch ID:** MP5099

- 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) D24957-1MS, D24957-1MSD, D24957-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Arsenic are outside control limits for sample MP5099-SD1. Serial dilution indicates possible matrix interference.

Wet Chemistry By Method SM19 2540B M

Matrix SO **Batch ID:** GN10311

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

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.

Mountain States ACCUTEST LABORATORIES

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	DEEP 4-36 BG6		
Lab Sample ID:	D24914-1	**Date Sampled:**	06/28/11
Matrix:	SO - Soil	**Date Received:**	06/29/11
		Percent Solids:	77.8
Project:	Hiawatha		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	87.7	0.50	mg/kg	5	06/30/11	06/30/11	GJ	SW846 6020 [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA1639
(2) Prep QC Batch: MP5099

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 BG7		
Lab Sample ID:	D24914-2	**Date Sampled:**	06/28/11
Matrix:	SO - Soil	**Date Received:**	06/29/11
		Percent Solids:	78.4
Project:	Hiawatha		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	41.3	0.51	mg/kg	5	06/30/11	06/30/11	GJ	SW846 6020 [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA1639
(2) Prep QC Batch: MP5099

RL = Reporting Limit

Report of Analysis

Client Sample ID:	DEEP 4-36 BG8		
Lab Sample ID:	D24914-3	**Date Sampled:**	06/28/11
Matrix:	SO - Soil	**Date Received:**	06/29/11
		Percent Solids:	78.4
Project:	Hiawatha		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	18.6	0.47	mg/kg	5	06/30/11	06/30/11	GJ	SW846 6020 [1]	SW846 3050B [2]

(1) Instrument QC Batch: MA1639
(2) Prep QC Batch: MP5099

RL = Reporting Limit

Mountain States ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

ACCUTEST Laboratories

4036 Youngfield St., Wheat Ridge, CO 80033; 303-425-6021; 303-425-6854

FED-EX Tracking #: | Bottle Order Control #:

Accutest Quote: BS8/2010-41 | Accutest Job #: D24914

Client / Reporting Information

Company Name: Olsson Associates

Project Contact: Tim Dobransky | E-Mail: tdobransky@oaconsulting.com

Address: 826 21 1/2 Road

City: Grand Junction | State: CO | Zip: 81505

Phone No.: 970-263-7800 | Fax No.:

Samplers's Name: JPK

Project Information

Project Name / No.: Hiawatha Deep 4-36 011-0383

Bill to: Olsson Assocaites | Invoice Attn.: Tim Dobransky

Address: 826 21 1/2 Road

City: Grand Junction | State: CO | Zip: 81505

Phone No.: 970-263-7800 | Fax No.:

Client Purchase Order #:

Requested Analyses

Table 910-1: Arsenic Only

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Wastewater
SO - Soil
SL - Sludge
OI - Oil
LIQ - Liquid
SOL - Other Solid

Accutest Sample #	Field ID / Point of Collection	Collection Date	Collection Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	ENCORE	NaHSO4	MEOH	NONE	Table 910-1: Arsenic Only	LAB USE ONLY
	DEEP 4-36 BG6	6/28/2011	1040	SO	1								X	X	01
	DEEP 4-36 BG7	6/28/2011	1105	SO	1								X	X	02
	DEEP 4-36 BG8	6/28/2011	1130	SO	1								X	X	03

Turnaround Time (Business days)

- [ ] 10 Day *STANDARD* — Approved By:/ Date:
- [ ] 7 Day (per contract)
- [x] 4 Day *RUSH*
- [ ] 3 Day *EMERGENCY*
- [ ] 2 Day *EMERGENCY*
- [ ] 1 Day *EMERGENCY*
- [ ] Other

Real time analytical data available via Lablink

Data Deliverable Information

- [ ] Commercial "A"
- [x] Commercial "B"
- [ ] Reduced Tier 1
- [ ] Full Data Package
- [ ] TRRP-13
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results & Standard QC

Comments / Remarks

AMS FEDEX Account Number - 467721860

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

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		6/28/11 1700	6/29/11 Jacob Porter 0900	2		2
3			3	4		4
5			5	Custody Seal # Fedex	On Ice ☒	Cooler Temp. 5.0°

D24914: Chain of Custody
Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D24914 **Client:** OLSSON ASS. **Immediate Client Services Action Required:** No

Date / Time Received: 6/29/2011 9:00:00 AM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: HIAWATHA DEEP 4-36 011-0383 **Airbill #'s:** Fedex

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021
4036 Youngfield Street
F: (303) 425-6854
Wheat Ridge, CO
www/accutest.com

D24914: Chain of Custody
Page 2 of 2

Mountain States ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D24914
Account: CORCCOGJ - Olsson Associates
Project: Hiawatha

QC Batch ID: MP5099
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 06/30/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.2		
Antimony	0.20	.001	.0095		
Arsenic	0.40	.049	.22	0.058	<0.40
Barium	1.0	.0035	.1		
Beryllium	0.10	.0075	.014		
Boron	20	.97	1		
Cadmium	0.050	.023	.048		
Calcium	200	1.8	8.2		
Chromium	1.0	.021	.24		
Cobalt	0.10	.0033	.003		
Copper	1.0	.011	.063		
Iron	20	.81	3.7		
Lead	0.25	.0012	.015		
Magnesium	50	.067	2.6		
Manganese	0.50	.007	.029		
Molybdenum	0.50	.0044	.023		
Nickel	1.0	.0029	.031		
Phosphorus	30	1.8	3.5		
Potassium	100	2	3.2		
Selenium	0.20	.075	.19		
Silver	0.050	.0008	.002		
Sodium	250	.8	4.4		
Strontium	10	.004	.04		
Thallium	0.10	.015	.02		
Tin	5.0	.006	.028		
Titanium	1.0	.035	.062		
Uranium	0.25	.00038	.0009		
Vanadium	2.0	.052	.29		
Zinc	5.0	.039	.12		

Associated samples MP5099: D24914-1, D24914-2, D24914-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24914
Account: CORCCOGJ - Olsson Associates
Project: Hiawatha

QC Batch ID: MP5099 Methods: SW846 6020
Matrix Type: SOLID Units: mg/kg

Prep Date: 06/30/11

Metal	D24957-1 Original	MS	Spikelot MPICPALL	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	5.8	108	110	92.5	60-119
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP5099: D24914-1, D24914-2, D24914-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24914
Account: CORCCOGJ - Olsson Associates
Project: Hiawatha

QC Batch ID: MP5099 Methods: SW846 6020
Matrix Type: SOLID Units: mg/kg

Prep Date: 06/30/11

Metal	D24957-1 Original	MSD	Spikelot MPICPALL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	5.8	105	108	91.6	2.8	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP5099: D24914-1, D24914-2, D24914-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D24914
Account: CORCCOGJ - Olsson Associates
Project: Hiawatha

QC Batch ID: MP5099
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 06/30/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	96.5	100	96.5	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP5099: D24914-1, D24914-2, D24914-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D24914
Account: CORCCOGJ - Olsson Associates
Project: Hiawatha

QC Batch ID: MP5099
Matrix Type: SOLID

Methods: SW846 6020
Units: ug/l

Prep Date: 06/30/11

Metal	D24957-1 Original	SDL 5:25	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	52.7	59.5	12.8*(a)	0-10
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP5099: D24914-1, D24914-2, D24914-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.