

State of Colorado
Oil and Gas Conservation Commission



#6867
Da # 2223070

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: <u>36200</u>	Contact Name and Telephone: <u>W. Gene Webb</u>
Name of Operator: <u>Grynberg Jack J (Grynberg Petroleum Company)</u>	No: <u>303.850.7490</u>
Address: <u>3600 S. Yosemite Street, Suite #900</u>	Fax: <u>303.850.7498</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80237</u>	
API Number: <u>05-081-07315</u>	County: <u>Moffat</u>
Facility Name: <u>Hiawatha State 1-A Pit</u>	Facility Number: <u>423470</u> <i>Loc. = 333008</i> <i>Pit Facility ID #</i>
Well Name: <u>Hiawatha State 1-A</u>	Well Number: <u>Hiawatha State 1-A (Loc. ID - 333008)</u> ✓
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SWSW, S36, T12N, R101W, 6PM</u>	Latitude: <u>40.951778</u> Longitude: <u>-108.704337</u>

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Produced water & condensate

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:
<input type="checkbox"/> Soils	<u>See Attached Notice of Completion Report</u>	<u>Visual observations, field screening and analytical analysis</u>
<input type="checkbox"/> Vegetation	<u>Remediation # Currently Unassigned</u>	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDATION WORKPLAN

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

Describe how source is to be removed:
See Attached Notice of Completion Report

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

JMP

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



Tracking Number: _____
Name of Operator: GRYNBERG PETROLEUM
OGCC Operator No: _____
Received Date: _____
Well Name & No: LOCATION ID # 333008
Facility Name & No: PIT FACILITY ID # 423470

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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

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

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

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

See Attached Notice of Completion Report

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: <u>6/6/2011</u>	Date Site Investigation Completed: <u>6/28/2011</u>	Date Remediation Plan Submitted: <u>6/5/2011</u>
Remediation Start Date: <u>6/8/2011</u>	Anticipated Completion Date: <u>Summer 2011</u>	Actual Completion Date: <u>7/22/2011</u>

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

Date: 02/15/2013

Alex Fischer
Supervisor
Western Region

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 State 1-A Facility #423470**

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 the drilling pit closure at the Grynberg Petroleum Company (Grynberg) facility identified as the Hiawatha State 1-A (API# 05-081-07315).

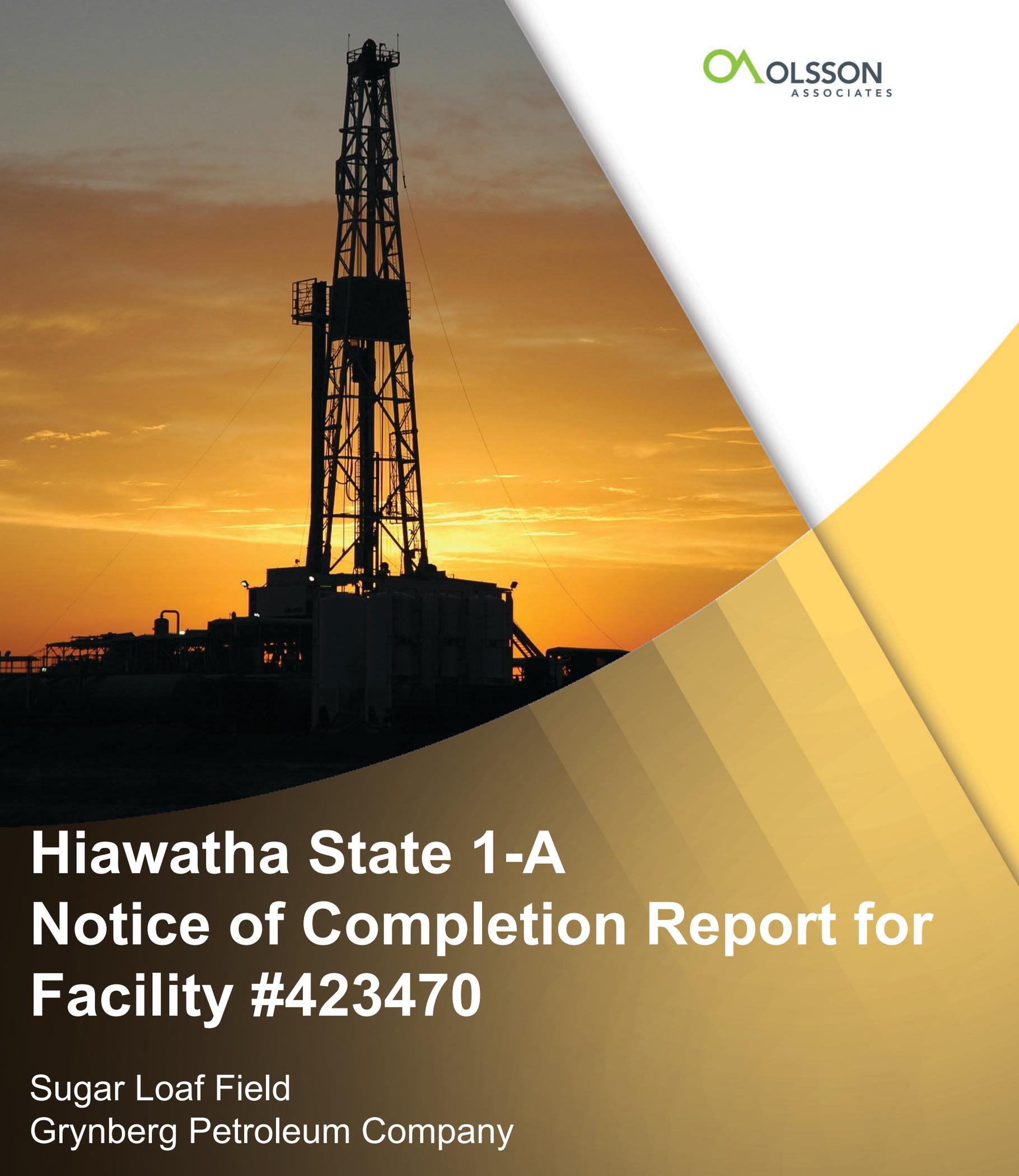
Please review the attached report at your convenience and contact me with any questions, concerns, or need for additional information.

Sincerely,
Olsson Associates



Tim Dobransky
Project Scientist

Cc: Gene Webb – Grynberg Petroleum Company
Attachments

A silhouette of an oil rig against a sunset sky, with a white and yellow geometric overlay on the right side of the page.

Hiawatha State 1-A Notice of Completion Report for Facility #423470

Sugar Loaf Field
Grynberg Petroleum Company

**GRYNBERG PETROLEUM COMPANY
SUGAR LOAF FIELD**

**HIAWATHA STATE 1-A
NOTICE OF COMPLETION REPORT FOR
FACILITY #423470**

Prepared For:

Grynberg Petroleum Company
3600 South 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 011-1181

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1.0 Introduction

Grynberg Petroleum Company (Grynberg) retained Olsson Associates, Incorporated (Olsson) to conduct soil remediation at a pit located at their Hiawatha 1-A facility (Site). The pit was lined with a woven synthetic material liner and 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 pit located at the Site.

The site was originally believed to be an extension of the Grynberg's facility Hiawatha Deep 4-36 due to its proximity and layout. As such, a Form 27 was not submitted prior to closure activities. After an April 25, 2011 on-site meeting with the Colorado Oil and Gas Conservation Commission (COGCC) it was determined that the site was indeed a separate location. A Form 27 for the pit closure activities is included in Appendix A. Liner removal and sub-liner investigation activities began on June 8, 2011 and were completed on June 28, 2012. 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 25, 2011 a compromise in the pit liner below former fluid level was documented. As specified in COGCC Rule 905.c a Spill/Release Report, Form 19, was prepared and submitted on June 5, 2011 (*Spill/Release tracking number 2214543*).

As the pit was not originally permitted through the COGCC a Form 15 Pit Report for the 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 COGCC database website, the Site planned location is latitude 40.951776, longitude -108.704337. A Site Location Map is included as Figure 1.

1.2 Evacuation of Pit Contents

Pit fluid removal was initiated on May 5, 2011 and completed on June, 6, 2011. The fluid, believed to be a combination of snow melt water and hydrocarbon sludge, was pumped into tankers and transported to the Calpet disposal facility in Evanston, Wyoming.

1.3 Remediation Activities

Remediation activities began on June 9, 2011 and were completed on June 28, 2011. Approximately 150 cubic yards of soil and bedrock was excavated from the pit. The impacted soil was characterized for disposal and transported to Rock Springs Landfill in Rock Springs, Wyoming.

Analytical results from the confirmation samples indicated that soils within the pit were below COGCC Table 910-1 standards and required no further remediation.

Backfilling the pit with clean soil and surface soil grading activities began on July 6, 2011 and were completed on July 22, 2011.

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

1.4 Pit Liner Investigation and Integrity Assessment

On April 25, 2011 prior to its removal, an assessment was made of the pit liner system. The system consisted of a woven liner underlain by strips of rock guard felt. The liner was found to be in poor condition with numerous holes and tears observed throughout, especially on the northern and southern side walls and pit bottom. It was also noted that the liner seams appeared to be sewn creating a conduit for potential leaks. Liner removal began and was completed June 8, 2011.

2.0 Pit Sub-Liner Investigation

Pit Bottom

The sub-liner investigation began on June 9, 2011 and was completed on June 28, 2011. Hydrocarbon staining of sub-liner soils along the pit bottom and portions of the sidewalls was noted. The pit was underlain by a hard sandstone bedrock which sloped from the east and west sidewalls to a low point in the center. The sandstone bedrock appeared moderately fractured in the center portion of the pit. Impacted soil and the uppermost layer of sandstone was scraped from the pit bottom and sidewalls prior to test pit excavation and temporarily stockpiled in a clay lined, bermed containment cell adjacent to the pit.

Twenty one test pits (TP-1 to TP-21) were excavated to depths ranging from 6 inches to 4 feet below the bottom of the pit base (approximately 10 feet to 14 feet below surrounding grade). The deeper test pits (TP-10, TP-11, TP-12 and TP-15) were located in the softer fractured sandstone. Representative soil samples from each test pit were field screened using a photoionization detector (PID) at approximate one-foot intervals for potential hydrocarbon impact. Field soil 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 ranged from 1 ppm (TP-7) to 167 ppm (TP-13). Areas exhibiting elevated PID readings were further excavated prior to collecting a soil sample for laboratory analysis. Field soil screening results for the pit bottom test pit locations are presented on Figure 2.

During excavation of test pit TP-10, groundwater was encountered at approximately 14 feet below surrounding grade. The groundwater had faint hydrocarbon odor, small spots of petroleum sheen, and a yellow tint. The groundwater is suspected to be from a shallow perched aquifer. A records search conducted on the Colorado Division of Water Resources on-line database indicated the nearest "useable" groundwater at an approximate depth of 800 feet below ground surface.

Pit Sidewalls

Representative soil samples from twelve locations, midway to pit bottom, from the north, south, east and west sidewalls were field screened with a PID for potential hydrocarbon impact. Field soil screening measurements ranged from 1.2 ppm (Pit Wall FS4) to 8.6 ppm (Pit wall FS7). Field soil screening results for the pit sidewall locations are presented on Figure 2.

3.0 Sampling and Analysis

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

3.1 Pit Soil

To assess whether all E&P waste had been removed from the pit, four grab soil samples were collected from the 0 to 1 foot interval from test pits TP-2, TP10, TP12, and TP20 located in pit bottom. Additionally, four grab soil samples were collected from the approximate center of the pit sidewalls (one each from north, south, east and west). These soil samples were analyzed for COGCC Rule 910 and Table 910-1 compliance and included:

- Total petroleum hydrocarbons (TPH) in the gasoline (GRO) and diesel range organic (DRO) 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

3.2 Pit Groundwater

In addition to the soil samples, one groundwater sample was collected from test pit TP-10 and analyzed for GRO, DRO, BTEX, chloride and sulfate using EPA Method 300, and total dissolved solids (TDS) using SM20 2540C.

3.3 Background Soil Samples

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 pit and analyzed for arsenic. Background sample locations are depicted on Figure 4.

4.0 Soil and Groundwater Analytical Results

The laboratory data reports, including the chain-of-custody forms, for the samples collected during the activities described above are included as Appendix C. As indicated on the laboratory reports, all samples arrived in good condition, within the appropriate temperature range, and analyzed within recommended holding times.

Attached Table 1 summarizes the pit soil sample analytical data. Table 2 below summarizes the analytical results for the groundwater sample collected from test pit TP-10. The background soil sample analytical results are summarized in attached Table 3.

Pit Soil

A summary of the soil sample analyses follows:

- Laboratory analysis reported TPH-GRO either below the COGCC Table 901-1 maximum TPH concentration for soil of 500 milligrams per kilogram (mg/kg) or below the laboratory reporting limit for the eight soil samples submitted for analysis.
- TPH-DRO concentrations were reported ranging from 21 mg/kg in the soil sample from test pit TP-10 to 2820 mg/kg in the initial soil sample collected from test pit TP-20. Initial analytical results for the soil sample collected from test pit TP-20 indicated DRO levels were above the COGCC Table 910-1 TPH concentration of 500 mg/kg. On June 28, 2011 that area of the pit was excavated further and a follow-up soil sample was collected and analyzed for DRO only. TPH-DRO concentrations for the second soil sample following the additional excavation from test pit TP-20 area was reported at 41.2 mg/kg, below the COGCC Table 910-1 maximum TPH concentration. TPH-DRO concentrations for the remaining seven soil samples were below the COGCC Table 910-1 level.
- BTEX concentrations were reported either below laboratory reporting limits of below their respective COGCC Table 910-1 concentration;
- Arsenic concentrations were reported ranging from 6.9 mg/kg (soil sample State 1-A TP-2) to 18.8 mg/kg (soil sample State 1-A NSW). The reported soil arsenic concentrations are above the COGCC Table 910-1 concentration for arsenic of 0.039 mg/kg, but are below or 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 metal concentrations were reported either below laboratory reporting limits or below their respective COGCC Table 910-1 concentrations.
- Laboratory analysis reported SAR in soil samples State 1-A SSW (13.1) and State 1-A ESW (15.1), above the COGCC Table 910-1 value for SAR of less than 12. The remaining soil sample SAR values are below the COGCC Table 910-1 SAR value.
- 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 value of less than 4 or two times background in soil samples State 1-A ESW at 7.04 millimhos per centimeter (mmhos/cm) and State 1-A WSW (4.18 mmhos/cm). Laboratory analysis reported EC in the remaining six soil samples below the COGCC Table 910-1 EC value.
- pH was reported above the COGCC Table 910-1 values of 6 to 9 in soil sample State 1-A TP-10 at 9.02 and soil sample State 1-A SSW at 9.64. pH for the remaining six soil samples was within the COGCC Table 910-1 pH value range; and
- Redox potential vs. H₂ (Redox) was reported between 384 millivolts (mv) and 499 mv. Percent solids were reported between 83.7 percent and 94.3 percent. There are no associated COGCC Table 910-1 regulatory values for Redox or percent solids.

Pit Groundwater

As can be observed in Table 2 below:

- BTEX was reported in the groundwater sample collected from test pit TP-10 below laboratory reporting limits;
- Chloride, total dissolved solids, and sulfate were included in the groundwater sample analyses. Collection and analysis of background groundwater samples was not anticipated for this project. Therefore a comparison of the reported concentrations of chloride, total dissolved solids, or sulfate with the concentrations listed in COGCC Table 910-1 cannot be performed.
- Concentrations of TPH-GRO and TPH-DRO were reported at 0.450 milligrams per liter (mg/l) and 26.9 mg/l, respectively. Currently, COGCC does have a regulatory concentration for TPH-GRO and TPH-DRO listed in Table 910-1.

Table 2 - TP-10 Groundwater Analytical Summary

Laboratory Data Summary			
Sample ID	State 1-A WS1	COGCC Table 910-1	Units
Sample Date	6/9/11	Concentrations	
TPH			
TPH – GRO	0.450	NA	mg/l
TPH – DRO	26.9	NA	mg/l
BTEX			
Benzene	< 0.25	5	ug/l
Toluene	< 1.0	560 to 1000	ug/l
Ethylbenzene	< 0.50	700	ug/l
Xylene (total)	< 2.0	1400 to 10,000	ug/l
Inorganics			
Chloride	635	1.25 x background	mg/l
Total Dissolved Solids	1900	1.25 x background	mg/l
Sulfate	45.8	1.25 x background	mg/l

NA – Not applicable

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;
- Reported 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 be the same as the pH measured in background soil sample BG1; and
- Redox and percent solids were reported at 445 mv and 91.4 percent, respectively.

5.0 Summary and Recommendations

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

Arsenic concentrations in all eight of the pit samples, specific conductivity in two pit samples, SAR in two of the pit samples, and pH in two of the pit samples exceeded COGCC Table 910-1 standards. A Sundry Notice requesting consideration of background arsenic concentrations, and consideration that elevated electrical conductivity, SAR, 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 aforementioned pit at the Site.

**Table 1
Hiawatha State 1-A Drilling Pit
Soil Analytical Summary**

SAMPLE SUMMARY	
Location Description	Hiawatha State 1-A Drilling Pit
Sample Type	Soil

LABORATORY DATA SUMMARY											
Sample ID	State 1-A TP-2	State 1-A TP-10	State 1-A TP-12	State 1-A TP-20	State 1-A TP-20	State 1-A SSW	State 1-A NSW	State 1-A ESW	State 1-A WSW	COGCC TABLE 910-1 CONCENTRATIONS	UNITS
Depth	0-6"	0-1'	0-1'	0-6"	0-6"	0-6"	0-6"	0-6"	0-6"		
Sample Date	6/9/2011	6/9/2011	6/9/2011	6/9/2011	6/28/2011	6/10/2011	6/10/2011	6/10/2011	6/10/2011		
Analytical Parameters											
TPH											
TPH Gasoline Range Organics	<6.4	<6.9	8.33 J	11.1 J	NT	<6.0	<6.2	<6.2	<6.1	500	mg/kg
TPH Diesel Range Organics	156	21	133	2820	41.2	395	321	48.8	53.7		
BTEX											
Benzene	<0.028	<0.030	<0.030	<0.026	NT	<0.026	<0.027	<0.027	<0.027	0.17	mg/kg
Toluene	<0.064	<0.069	<0.069	<0.060	NT	0.129	<0.062	<0.062	<0.061	85	mg/kg
Ethylbenzene	<0.032	<0.035	<0.034	<0.030	NT	<0.030	<0.031	<0.031	<0.031	100	mg/kg
Xylene (total)	0.139 J	<0.14	0.15 J	<0.120	NT	0.190 J	<0.12	<0.12	<0.12	175	mg/kg
Metals											
Arsenic	6.9	9.2	8.0	7.3	NT	14.2	18.8	17.1	11.0	0.39	mg/kg
Barium	110	80.3	30.1	63.5	NT	134	47.5	52.3	36.4	15,000	mg/kg
Cadmium	<1.1	<1.1	<1.1	<1.0	<1.1	<1.1	<1.1	<1.1	<1.1	70	mg/kg
Chromium	18.0	14.4	10.4	12.6	NT	11.0	15.3	14.1	17.1	NA	mg/kg
Chromium, Hexavalent	0.56	0.62	<0.48	0.57	NT	0.99	0.69	0.88	1.5	23	mg/kg
Chromium, Trivalent	17.4	13.8	10.1	12.0	NT	10.0	14.6	13.2	15.6	120,000	mg/kg
Copper	9.4	4.6	2.8	7.9	NT	8.5	13.9	20.0	11.0	3,100	mg/kg
Lead	8.6	7.0	5.7	6.9	NT	11.9	10.3	13.6	8.0	400	mg/kg
Mercury	<0.10	<0.11	<0.11	<0.10	NT	<0.11	<0.11	<0.099	<0.10	23	mg/kg
Nickel	15.8	13.8	11.5	12.8	NT	12.7	16.1	21.1	14.6	1,600	mg/kg
Selenium	<5.6	<5.7	<5.7	<5.1	NT	<5.5	<5.3	<5.5	<5.3	390	mg/kg
Silver	<3.4	<3.4	<3.4	<3.1	NT	<3.3	<3.2	<3.3	<3.2	390	mg/kg
Zinc	31.3	35.6	23.2	30.3	NT	33.4	40.3	52.9	34.3	23,000	mg/kg
SAR Metals Analysis											
Calcium	398	46.2	38.1	480	NT	19.4	205	286	402	NA	mg/L
Magnesium	55.6	10.3	6.28	81.4	NT	4.42	18.8	211	91.5	NA	mg/L
Sodium	626	99.1	49.8	409	NT	246	423	1380	644	NA	mg/L
Sodium Adsorption Ratio	7.78	3.43	1.97	4.54	NT	13.1	7.57	15.1	7.54	<12	ratio
Polynuclear Aromatic Hydrocarbons											
Acenaphthene	<0.012	<0.013	<0.013	<0.029	NT	<0.059	<0.060	<0.0060	<0.0059	1,000	mg/kg
Anthracene	<0.014	<0.014	<0.014	<0.033	NT	<0.066	<0.067	<0.0067	<0.0067	1,000	mg/kg
Benzo(a)anthracene	<0.020	<0.021	<0.021	<0.048	NT	<0.095	<0.097	<0.0097	<0.0096	0.22	mg/kg
Benzo(a)pyrene	<0.027	<0.029	<0.029	<0.066	NT	<0.13	<0.13	<0.013	<0.013	0.022	mg/kg
Benzo(b)fluoranthene	<0.028	<0.029	<0.029	<0.068	NT	<0.14	<0.14	<0.014	<0.014	0.22	mg/kg
Benzo(k)fluoranthene	<0.017	<0.018	<0.017	<0.040	NT	<0.081	<0.082	<0.0082	<0.0081	2.2	mg/kg
Chrysene	<0.017	<0.018	<0.017	0.0714 J	NT	<0.081	<0.082	<0.0082	<0.0081	22	mg/kg
Dibenzo(a,h)anthracene	<0.028	<0.029	<0.029	<0.068	NT	<0.14	<0.14	<0.014	<0.014	0.022	mg/kg
Fluoranthene	<0.015	<0.016	<0.016	<0.037	NT	<0.073	<0.075	<0.0075	<0.0074	1,000	mg/kg
Fluorene	<0.013	<0.014	0.0231	<0.031	NT	<0.062	<0.064	<0.0064	<0.0063	1,000	mg/kg
Indeno(1,2,3-cd)pyrene	<0.042	<0.044	<0.044	<0.10	NT	<0.20	<0.21	<0.021	<0.020	0.22	mg/kg
Napthalene	<0.014	<0.015	<0.015	<0.035	NT	<0.070	<0.071	<0.0071	<0.0070	23	mg/kg
Pyrene	<0.014	<0.015	<0.015	0.0608	NT	<0.070	<0.071	<0.0071	<0.0070	1,000	mg/kg
General Chemistry											
Redox Potential Vs H2	489	447	442	472	NT	384	452	461	499	NA	mv
Solids, Percent	88	83.7	84.0	90.6	94.3	90.7	89.0	88.8	89.7	NA	%
Electrical Conductivity	3.60	0.657	0.431	3.47	NT	1.16	2.58	7.04	4.18	<4 or 2 x the background	mmhos/cm
pH	8.14	8.81	9.02	8.75	NT	9.64	8.89	8.89	8.41	6-9	su

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

Over TABLE 910-1 concentration but under BACKGROUND level.
Over TABLE 910-1 concentration and not within BACKGROUND level.
Over TABLE 910-1 concentration

**Table 3
Hiawatha State 1-A Background
Soil Analytical Summary**

SAMPLE SUMMARY	
Location Description	Hiawatha State 1-A
Sample Type	Soil

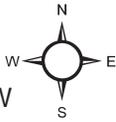
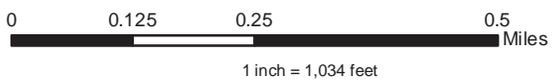
LABORATORY DATA SUMMARY										
Sample ID	BG1	BG2	BG3	BG4	BG5	DEEP 4-36 BG6	DEEP 4-36 BG7	DEEP 4-36 BG8	COGCC TABLE 910-1 CONCENTRATIONS	UNITS
Depth	0-6"	0-6"	0-6"	0-6"	0-6"	10-10.5'	11.5-12.5'	12-13'		
Sample Date	6/8/2011	6/8/2011	6/8/2011	6/8/2011	6/6/2011	6/28/2011	6/28/2011	6/28/2011		
Analytical 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	
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

Note: Hiawatha Deep 4-36 background sample results used due to proximity of locations.



 Sections NAD83
 Hiawatha State 1A



SWSW S36 T12W R101W

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

SITE LOCATION
 HIAWATHA STATE 1-A
 GRYNBERG PETROLEUM
 MOFFAT COUNTY, CO



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

FIGURE
1



LEGEND
 PID = Photoionization Detector
 ppm = Parts per million



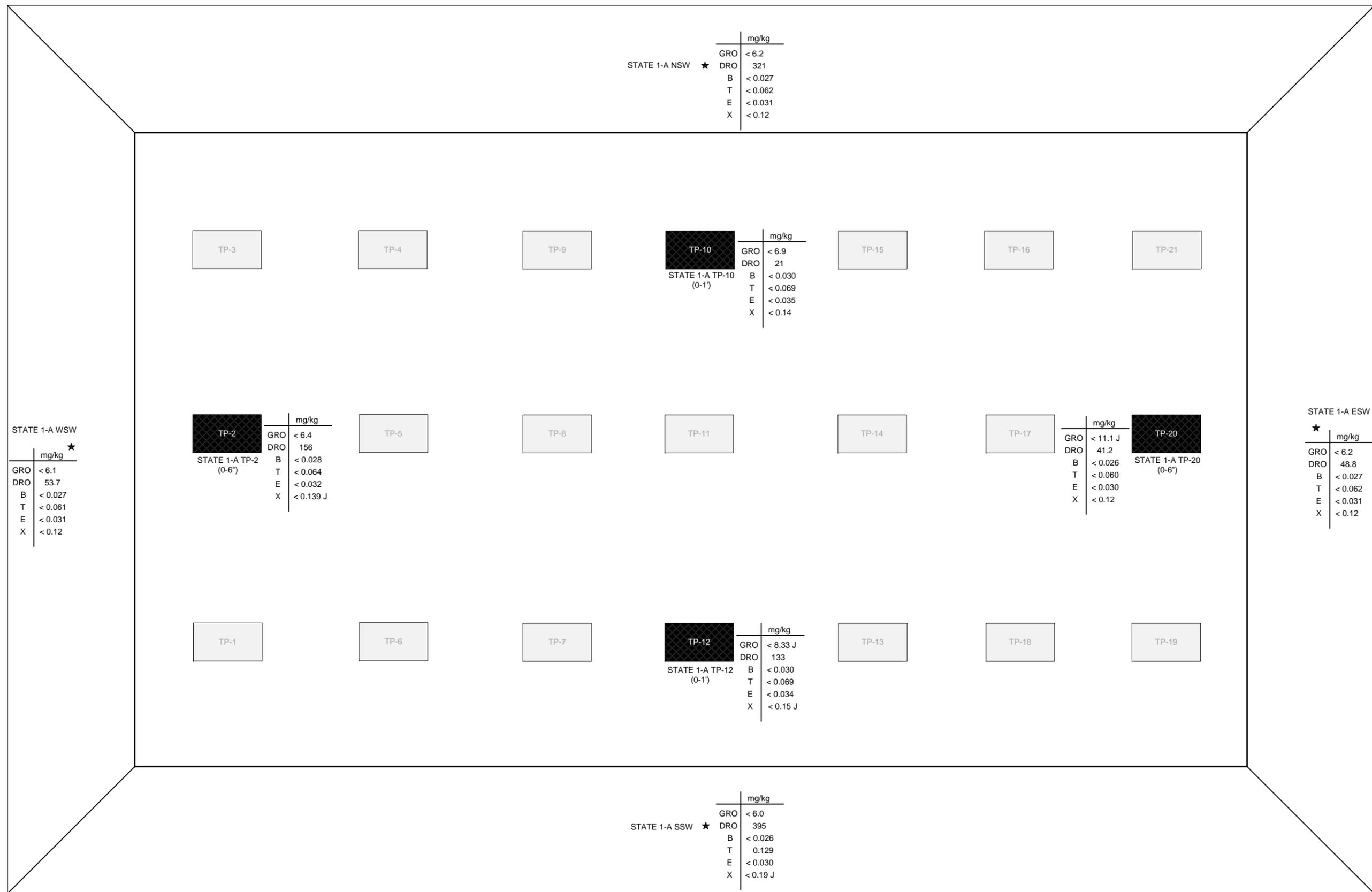
NOT TO SCALE

PROJECT NO: 011-1181
 DRAWN BY: TPD
 DATE: 2/17/2012

State 1-A 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



LEGEND

GRO = Gas Range Organics
DRO = Diesel Range Organics
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylene
J = Estimated Value
mg/kg = milligrams per kilograms
★ = Side Wall Location
= Soil Sample Location
= Test Pit
= Soil Sample Location



NOT TO SCALE

PROJECT NO: 011-1181
DRAWN BY: TPD
DATE: 2/17/2012

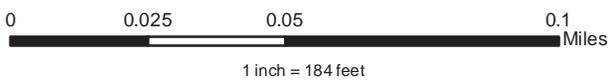
Hiawatha State 1-A Pit
Soil Sample Locations
Grynberg Petroleum

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

FIGURE
3



- Sample Location
- Hiawatha State 1A
- Hiawatha Deep 4-36



SWSW S36 T12W R101W

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

BACKGROUND SAMPLE LOCATION
 HIAWATHA STATE 1-A
 GRYNBERG PETROLEUM
 MOFFAT COUNTY, CO



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

FIGURE
4

Appendix A
COGCC Forms

State of Colorado
Oil and Gas Conservation Commission



FOR OGCC USE ONLY

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

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.

OGCC Employee:
 Spill Complaint
 Inspection NOAV
 Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

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

OGCC Operator Number: <u>36200</u>	Contact Name and Telephone: <u>W. Gene Webb</u>
Name of Operator: <u>Grynberg Jack J (Grynberg Petroleum Company)</u>	No: <u>303.850.7490</u>
Address: <u>3600 S. Yosemite Street, Suite #900</u>	Fax: <u>303.850.7498</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80237</u>	
API Number: <u>05-081-07315</u> County: <u>Moffat</u>	
Facility Name: <u>Hiawatha State 1-A Pit</u> Facility Number: <u>423470</u>	
Well Name: <u>Hiawatha State 1-A</u> Well Number: <u>Hiawatha State 1-A (Loc. ID - 333008)</u>	
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SWSW, S36, T12N, R101W, 6PM</u> Latitude: <u>40.951778</u> Longitude: <u>-108.704337</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Produced water & condensate

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:
<input type="checkbox"/> Soils	<u>See Attached Notice of Completion Report</u>	<u>Visual observations, field screening and analytical analysis</u>
<input type="checkbox"/> Vegetation	<u>Remediation # Currently Unassigned</u>	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDATION WORKPLAN

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

Describe how source is to be removed:
See Attached Notice of Completion Report

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



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

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

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

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

See Attached Notice of Completion Report

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 6/6/2011 Date Site Investigation Completed: 6/28/2011 Date Remediation Plan Submitted: 6/5/2011
Remediation Start Date: 6/8/2011 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: 423470

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

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

ATTACHMENTS

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

Pit Location Information

Operator's Pit/Facility Name: Hiawatha State 1-A Operator's Pit/Facility Number: 423470
 API Number (associated well): 05- 081 7315
 OGCC Location ID (associated location): 333008 Or Form 2A #
 Pit Location (QtrQtr, Sec, Twp, Rng, Meridian): SWS4-S36 - 12N-101E- 6thE
 Latitude: 40.951776 Longitude: -108.704337 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 Injection; Commercial; Reuse/Recycle; NPDES; Permit Number:
 pit contents:
 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: Width: Depth: Calc. Volume (barrels):
 Flow Rates (in bbl/day): Inflow: Outflow: Evaporation: Percolation:
 Primary Liner. Type: Woven Poly Thickness (mil):
 Secondary 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: [Signature] Print Name: Jack J. Grynberg
 Title: President Email: grynpetro@grynberg.com Date: 02/27/2012

Approval

Signed: Title: Date:

BMP

Type

Comment

Type	Comment

Total: 0 comment(s)

CONDITIONS OF APPROVAL:

State of Colorado
Oil and Gas Conservation Commission



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

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	4. Contact Name W. Gene Webb	Complete the Attachment Checklist OP OGCC
2. Name of Operator: Grynberg Jack J (Grynberg Petroleum Company)	Phone: 303.850.7490	
3. Address: 3600 Yosemite Street, Suite #900 City: Denver State: CO Zip: 80237	Fax: 303.850.7498	
5. API Number 05-081-07315	OGCC Facility ID Number 333008	Survey Plat
6. Well/Facility Name: Hiawatha State 1-A Pit	7. Well/Facility Number 423470	Directional Survey
8. Location (Qtr/Clr, Sec, Twp, Rng, Meridian): SWSW, Sec. 36, T12N, R101W, 6PM		Surface Eqpmt Diagram
9. County: Moffat	10. Field Name: Sugar Loaf - #80000	Technical Info Page
11. Federal, Indian or State Lease Number:		Other

General Notice

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

Change of Surface Footage from Exterior Section Lines:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change of Surface Footage to Exterior Section Lines:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change of Bottomhole Footage from Exterior Section Lines:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change of Bottomhole Footage to Exterior Section Lines:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Bottomhole location Qtr/Clr, Sec, Twp, Rng, Mer _____ attach directional survey

Latitude _____ Distance to nearest property line _____ Distance to nearest bldg, public rd, utility or RR _____

Longitude _____ Distance to nearest lease line _____ Is location in a High Density Area (rule 603b)? Yes/No

Ground Elevation _____ Distance to nearest well same formation _____ 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.)

<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Disposal
<input type="checkbox"/> Change Drilling Plans	<input type="checkbox"/> Repair Well	<input type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested	<input type="checkbox"/> Status Update/Change of Remediation Plans
<input type="checkbox"/> Casing/Cementing Program Change	<input checked="" type="checkbox"/> Other: Background Arsenic/SAR & EC 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: [Signature] Date: 2/24/12 Email: grynpetro@grynberg.com
Print Name: Jack J. Grynberg Title: President

OGCC Approved: _____ Title: _____ Date: _____

CONDITIONS OF APPROVAL, IF ANY:

TECHNICAL INFORMATION PAGE



FOR OGCC USE ONLY

1. OGCC Operator Number: 36200	API Number: 05-081-07315
2. Name of Operator: Grynberg Jack J (Grynberg Petroleum)	OGCC Facility ID # 333008
3. Well/Facility Name: Hiawatha State 1-A Pit	Well/Facility Number: 423470
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 State 1-A:

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

This COGCC Form 4 is being submitted in conjunction with a Form 27 (Remediation # currently unassigned) for the Hiawatha State 1-A location. During a site inspection by the COGCC Area Field Inspector on April 25, 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 June 5, 2011 (Spill/Release Tracking #2214543). 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, SAR, pH and arsenic concentrations.

Eight confirmation samples were collected from various locations within the drilling pit bottom (approximately 10-12 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 two locations, SAR at two locations and pH at two locations.

*Arsenic Concentrations

Five grab background samples were collected from nearby non-impacted, native soil from a depth of 0-6 inches and three grab background 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.

- State 1-A TP-2 (confirmation sample) - 6.9 mg/kg
- State 1-A TP-10 (confirmation sample) - 9.2 mg/kg
- State 1-A TP-12 (confirmation sample) - 8.0 mg/kg
- State 1-A TP-20 (confirmation sample) - 7.3 mg/kg
- State 1-A SSW (confirmation sample) - 14.2 mg/kg
- State 1-A NSW (confirmation sample) - 18.8 mg/kg
- State 1-A ESW (confirmation sample) - 17.1 mg/kg
- State 1-A WSW (confirmation sample) - 11.0 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, SAR & pH

As shown in the analytical results summary, the electrical conductivity at two sample locations, SAR at two sample locations and the pH at two locations exceeds the COGCC Table 910-1 allowable concentrations. Grynberg is requesting COGCC consideration that elevated electrical conductivity, SAR 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
Photographic Log

Appendix B
Grynberg Petroleum Company
Hiawatha State 1-A Pit Closure



PHOTO 1

Date: June 8, 2011
View: Initialization of liner removal.



PHOTO 2

Date: June 8, 2011
View: Liner removal activities.
Looking northwest.



PHOTO 3

Date: June 8, 2011
View: Liner removal activities & stained soil.

Appendix B
Grynberg Petroleum Company
Hiawatha State 1-A Pit Closure



PHOTO 4

Date: June 8, 2011

View: Liner removal activities. Looking south. Deep 4-36 is in the background.



PHOTO 5

Date: June 8, 2011

View: Perimeter liner removal activities. Looking west.



PHOTO 6

Date: June 9, 2011

View: Impacted soil removal prior to test pit excavation.

Appendix B
Grynberg Petroleum Company
Hiawatha State 1-A Pit Closure



PHOTO 7

Date: June 9, 2011

View: Impacted soils removal from pit bottom and sidewalls prior to test pit excavation. Looking northeast.



PHOTO 8

Date: June 9, 2011

View: Impacted soils removal from pit bottom and sidewalls prior to test pit excavation. Looking east.



PHOTO 9

Date: June 9, 2011

View: Test pit inspection with COGCC representatives.

Appendix B
Grynberg Petroleum Company
Hiawatha State 1-A Pit Closure



PHOTO 10

Date: June 9, 2011

View: Test pit inspection with COGCC representatives at fractured center portion of drilling pit.



PHOTO 11

Date: June 9, 2011

View: Test pits. Looking west.



PHOTO 12

Date: June 9, 2011

View: Typical test pit geology.

Appendix B
Grynberg Petroleum Company
Hiawatha State 1-A Pit Closure



PHOTO 13

Date: June 9, 2011
View: Typical test pit geology.



PHOTO 14

Date: June 9, 2011
View: Typical test pit geology.



PHOTO 15

Date: June 9, 2011
View: Perched groundwater seeping into TP-10.

Appendix B
Grynberg Petroleum Company
Hiawatha State 1-A Pit Closure



PHOTO 16

Date: June 9, 2011

View: Perched groundwater seeping into TP-10.



PHOTO 17

Date: June 9, 2011

View: Hotspot removal at northeast corner and along east sidewall. Looking northeast.



PHOTO 18

Date: June 28, 2011

View: Re-sample at TP-20 after further soil scraping.

Appendix B
Grynberg Petroleum Company
Hiawatha State 1-A Pit Closure



PHOTO 19

Date: July 22, 2011

View: View of former drilling pit location after backfilling and re-contouring. Looking west.



PHOTO 20

Date: June 9, 2011

View: View of former drilling pit location after backfilling and re-contouring. Looking southwest.



PHOTO 21

Date: June 28, 2011

View: View of former drilling pit location after backfilling and re-contouring. Looking south.

Laboratory Analytical Results

Technical Report for

Olsson Associates

Grynberg State 1-A

Accutest Job Number: D24306

Sampling Date: 06/09/11

Report to:

Olsson Associates

kkreie@oaconsulting.com

ATTN: Ken Kreie

Total number of pages in report: 13



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)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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1

2

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Sample Summary

Olsson Associates

Job No: D24306

Grynberg State 1-A

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
D24306-1	06/09/11	08:00 JK	06/11/11	AQ	Ground Water	STATE 1-A WS-1

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D24306

Site: Grynberg State 1-A

Report Dat 6/27/2011 9:20:13 AM

On 06/11/2011, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 5.7 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D24306 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 AQ	Batch ID: V3V698
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24556-3MS, D24556-3MSD were used as the QC samples indicated.

Volatiles by GC By Method SW846 8015B

Matrix AQ	Batch ID: GGB638
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D24358-1MS, D24358-1MSD 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 AQ	Batch ID: OP3850
------------------	-------------------------

- All samples were extracted 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) D23879-31MS, D23879-31MSD were used as the QC samples indicated.

Wet Chemistry By Method EPA 300/SW846 9056

Matrix AQ	Batch ID: GP4710
------------------	-------------------------

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24232-1MS, D24232-1MSD were used as the QC samples for the Chloride, Sulfate, Chloride analysis.

Wet Chemistry By Method SM20 2540C

Matrix AQ	Batch ID: GN10048
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24358-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

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 Results

Report of Analysis

Report of Analysis

Client Sample ID: STATE 1-A WS-1	Date Sampled: 06/09/11
Lab Sample ID: D24306-1	Date Received: 06/11/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8260B	
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V12471.D	1	06/20/11	DC	n/a	n/a	V3V698
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	4.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	87%		63-130%
2037-26-5	Toluene-D8	88%		68-130%
460-00-4	4-Bromofluorobenzene	79%		61-130%

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

3.1
3

Client Sample ID: STATE 1-A WS-1	Date Sampled: 06/09/11
Lab Sample ID: D24306-1	Date Received: 06/11/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8015B	
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB11094.D	1	06/16/11	BR	n/a	n/a	GGB638
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	0.450	0.20	0.10	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	98%		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

3.1
3

Client Sample ID: STATE 1-A WS-1	Date Sampled: 06/09/11
Lab Sample ID: D24306-1	Date Received: 06/11/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846-8015B SW846 3546	
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07069.D	1	06/15/11	EH	06/13/11	OP3850	GFD309
Run #2							

	Initial Volume	Final Volume
Run #1	900 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	26.9	0.44	0.30	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	66%		29-150%		

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: STATE 1-A WS-1	Date Sampled: 06/09/11
Lab Sample ID: D24306-1	Date Received: 06/11/11
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	635	10	mg/l	20	06/20/11 15:33	CB	EPA 300/SW846 9056
Solids, Total Dissolved	1900	10	mg/l	1	06/16/11	JK	SM20 2540C
Sulfate	45.8	5.0	mg/l	10	06/20/11 14:30	CB	EPA 300/SW846 9056

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

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

FED-EX Tracking #	Bottle Order Control #
Accutest Quote B58/2010-41	Accutest Job # D24306

Client / Reporting Information		Project Information		Requested Analyses										Matrix Codes								
Company Name Olsson Associates		Project Name / No. Grynberg State 1-A (011-1181 100 100001)												DW - Drinking Water								
Project Contact Tim Dobransky		Bill to Olsson Associates												GW - Ground Water								
E-Mail tdobransky@oaconsulting.com		Invoice Attn. Tim Dobransky												WW - Wastewater								
Address 826 21 1/2 Road		Address 826 21 1/2 Road												SO - Soil								
City Grand Junction		City Grand Junction												SL - Sludge								
State CO		State CO												OI - Oil								
Zip 81505		Zip 81505												LIQ - Liquid								
Phone No. 970-263-7800		Phone No. 970-263-7800												SQL - Other Solid								
Fax No.		Fax No.												LAB USE ONLY								
Samplers Name JK/TPD		Client Purchase Order #																				
Accutest Sample #	Field ID / Point of Collection	Collection		Number of preserved bottles																		
		Date	Time	Matrix	# of bottles	HCl	MNH	PHOS	RSO4	BIORC	NIH3O4	MEDH	NONE	TPH (GRO)	TPH (DRO)	BTEX	TDS	Chloride	Sulfates			
	State 1-A WS1	6/9/2011	800	GW	9									X	X	X	X	X	X	X		

Turnaround Time (Business days)		Data Deliverable Information		Comments / Remarks	
<input checked="" type="checkbox"/> 10 Day STANDARD <input type="checkbox"/> 7 Day (per contract) <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <input type="checkbox"/> Other		Approved By/ Date: _____ <input type="checkbox"/> Commercial "A" <input checked="" type="checkbox"/> Commercial "B" <input type="checkbox"/> Reduced Tier 1 <input type="checkbox"/> Full Data Package Commercial "A" = Results Only Commercial "B" = Results & Standard QC		TRRP-13 <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____ AMS FEDEX Account Number - 467721880	

Real time analytical data available via Lablink

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

Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
	6/10/11 1700	1	2		
			4		
			Custody Relinquished		

On Ice Cooler Temp. 5.7

D24306: Chain of Custody
Page 1 of 2



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D24306

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 STATE 1A

Airbill #'s: Fedex

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

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

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

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

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

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

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www.accutest.com

4.1
4

Technical Report for

Olsson Associates

Grynberg State 1-A

Accutest Job Number: D24302

Sampling Dates: 06/09/11 - 06/10/11

Report to:

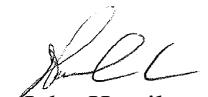
Olsson Associates
826 21 1/2 Road
Grand Junction, CO 81505
tdobransky@oaconsulting.com

ATTN: Tim Dobransky

Total number of pages in report: **145**



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)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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Sample Summary

Olsson Associates

Job No: D24302

Grynberg State 1-A

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D24302-1	06/09/11	13:30 JK	06/11/11	SO	Soil	STATE 1-A TP-2 (0-6")
D24302-1A	06/09/11	13:30 JK	06/11/11	SO	Soil	STATE 1-A TP-2 (0-6")
D24302-2	06/09/11	13:45 JK	06/11/11	SO	Soil	STATE 1-A TP-20 (0-6")
D24302-2A	06/09/11	13:45 JK	06/11/11	SO	Soil	STATE 1-A TP-20 (0-6")
D24302-3	06/09/11	14:00 JK	06/11/11	SO	Soil	STATE 1-A TP-10 (0-1')
D24302-3A	06/09/11	14:00 JK	06/11/11	SO	Soil	STATE 1-A TP-10 (0-1')
D24302-4	06/09/11	14:10 JK	06/11/11	SO	Soil	STATE 1-A TP-12 (0-1')
D24302-4A	06/09/11	14:10 JK	06/11/11	SO	Soil	STATE 1-A TP-12 (0-1')
D24302-5	06/10/11	09:15 JK	06/11/11	SO	Soil	STATE 1-A SSW
D24302-5A	06/10/11	09:15 JK	06/11/11	SO	Soil	STATE 1-A SSW
D24302-6	06/10/11	09:30 JK	06/11/11	SO	Soil	STATE 1-A NSW
D24302-6A	06/10/11	09:30 JK	06/11/11	SO	Soil	STATE 1-A NSW
D24302-7	06/10/11	09:45 JK	06/11/11	SO	Soil	STATE 1-A ESW

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



Sample Summary

(continued)

Olsson Associates

Job No: D24302

Grynberg State 1-A

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D24302-7A	06/10/11	09:45 JK	06/11/11	SO	Soil	STATE 1-A ESW
D24302-8	06/10/11	10:00 JK	06/11/11	SO	Soil	STATE 1-A WSW
D24302-8A	06/10/11	10:00 JK	06/11/11	SO	Soil	STATE 1-A WSW

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D24302

Site: Grynberg State 1-A

Report Dat 6/24/2011 4:28:52 PM

On 06/11/2011, 8 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D24302 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: V3V699
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- D24302-3: confirmation run

Matrix SO	Batch ID: V5V952
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D24436-1MS, D24436-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO	Batch ID: V6V340
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D24242-1MS, D24242-1MSD 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: OP3869

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D24345-1MS, D24345-1MSD 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 multiple analytes are outside control limits. Outside control limits due to dilution.
- D24302-1, D24302-3, D24302-4: Elevated RL due to matrix interference.
- OP3869-MS, OP3869-MSD: Dilution required due to matrix interference; extract was viscous.

Matrix SO

Batch ID: OP3893

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D24515-1MS, D24515-1MSD 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 multiple analytes are outside control limits. Outside control limits due to dilution.
- The RPD(s) for the MS and MSD recoveries of Pyrene are outside control limits for sample OP3893-MSD. Probable cause due to sample homogeneity.
- D24302-5, D24302-6: Dilution required due to matrix interference.

Volatiles by GC By Method SW846 8015B

Matrix SO

Batch ID: GGA666

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24532-1MS, D24532-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

Matrix SO

Batch ID: OP3913

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D24302-1MS, D24302-1MSD 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:** MP4927

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24302-2AMS, D24302-2AMSD were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Calcium are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

Matrix SO **Batch ID:** MP4922

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24251-1MS, D24251-1MSD, D24251-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Barium, Chromium, Lead, Nickel, Zinc are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- The serial dilution RPD(s) for Cadmium, Selenium, Silver are outside control limits for sample MP4922-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 MP4922-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

Matrix SO **Batch ID:** MP4923

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24251-1MS, D24251-1MSD, D24251-1SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471A

Matrix SO **Batch ID:** MP4959

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D24302-1MS, D24302-1MSD 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.

Wet Chemistry By Method SM19 2540B M

Matrix SO **Batch ID:** GN10026

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

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO **Batch ID:** R7983

- 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: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: D24302-1 through D24302-8.

Wet Chemistry By Method USDA HANDBOOK 60

Matrix SO	Batch ID: MP4927
------------------	-------------------------

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

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

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

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D24302

Site: CORCCOGJ: Grynberg State 1-A (011-1181_100_100001)

Report Date 6/23/2011 9:33:25 AM

8 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on between 06/09/2011 and 06/10/2011 and were received at Accutest on 06/11/2011 properly preserved, at 2.9 Deg. C and intact. These Samples received an Accutest job number of D24302. 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: 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(D24302).

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: STATE 1-A TP-2 (0-6")	
Lab Sample ID: D24302-1	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 88.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06601.D	1	06/18/11	DC	n/a	n/a	V6V340
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	64	28	ug/kg	
108-88-3	Toluene	ND	130	64	ug/kg	
100-41-4	Ethylbenzene	ND	130	32	ug/kg	
1330-20-7	Xylene (total)	139	250	130	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	80%		70-130%
460-00-4	4-Bromofluorobenzene	93%		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: STATE 1-A TP-2 (0-6")	
Lab Sample ID: D24302-1	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546	Percent Solids: 88.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G04503.D	2	06/17/11	TMB	06/15/11	OP3869	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	15	12	ug/kg	
120-12-7	Anthracene	ND	15	14	ug/kg	
56-55-3	Benzo(a)anthracene	ND	38	20	ug/kg	
50-32-8	Benzo(a)pyrene	ND	38	27	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	38	28	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	38	17	ug/kg	
218-01-9	Chrysene	ND	38	17	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	38	28	ug/kg	
206-44-0	Fluoranthene	ND	15	15	ug/kg	
86-73-7	Fluorene	ND	15	13	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	45	42	ug/kg	
91-20-3	Naphthalene	ND	15	14	ug/kg	
129-00-0	Pyrene	ND	15	14	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	53%		10-193%
321-60-8	2-Fluorobiphenyl	51%		20-138%
1718-51-0	Terphenyl-d14	70%		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

3.1
3

Client Sample ID: STATE 1-A TP-2 (0-6")	
Lab Sample ID: D24302-1	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 88.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12278.D	1	06/17/11	SK	n/a	n/a	GGA666
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	13	6.4	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

3.1
3

Client Sample ID: STATE 1-A TP-2 (0-6")	
Lab Sample ID: D24302-1	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846-8015B SW846 3546	Percent Solids: 88.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07351.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
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)	156	15	9.8	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: STATE 1-A TP-2 (0-6")	Date Sampled: 06/09/11
Lab Sample ID: D24302-1	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 88.0
Project: Grynberg State 1-A	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	6.9	0.45	mg/kg	5	06/14/11	06/15/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	110	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	18.0	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	9.4	1.1	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	8.6	5.6	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.10	0.10	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	15.8	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.6	5.6	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.4	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	31.3	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1597
- (3) Instrument QC Batch: MA1600
- (4) Instrument QC Batch: MA1603
- (5) Prep QC Batch: MP4922
- (6) Prep QC Batch: MP4923
- (7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

31
3

Client Sample ID: STATE 1-A TP-2 (0-6")	
Lab Sample ID: D24302-1	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 88.0
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	0.56	0.44	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	17.4	1.5	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	489		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	88		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	3600	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.14		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: STATE 1-A TP-2 (0-6")	Date Sampled: 06/09/11
Lab Sample ID: D24302-1A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 88.0
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	398	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	55.6	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	626	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-2 (0-6")	Date Sampled: 06/09/11
Lab Sample ID: D24302-1A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 88.0
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	7.78		ratio	1	06/15/11 19:06	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-20 (0-6")	
Lab Sample ID: D24302-2	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 90.6
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06602.D	1	06/18/11	DC	n/a	n/a	V6V340
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	60	26	ug/kg	
108-88-3	Toluene	ND	120	60	ug/kg	
100-41-4	Ethylbenzene	ND	120	30	ug/kg	
1330-20-7	Xylene (total)	ND	240	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	104%		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: STATE 1-A TP-20 (0-6")	
Lab Sample ID: D24302-2	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546	Percent Solids: 90.6
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G04541.D	5	06/18/11	TMB	06/15/11	OP3869	E3G169
Run #2							

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

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	37	29	ug/kg	
120-12-7	Anthracene	ND	37	33	ug/kg	
56-55-3	Benzo(a)anthracene	ND	92	48	ug/kg	
50-32-8	Benzo(a)pyrene	ND	92	66	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	92	68	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	92	40	ug/kg	
218-01-9	Chrysene	71.4	92	40	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	92	68	ug/kg	
206-44-0	Fluoranthene	ND	37	37	ug/kg	
86-73-7	Fluorene	ND	37	31	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	110	100	ug/kg	
91-20-3	Naphthalene	ND	37	35	ug/kg	
129-00-0	Pyrene	60.8	37	35	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	83%		10-193%
321-60-8	2-Fluorobiphenyl	73%		20-138%
1718-51-0	Terphenyl-d14	86%		17-174%

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

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

Report of Analysis

Client Sample ID: STATE 1-A TP-20 (0-6")	
Lab Sample ID: D24302-2	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 90.6
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12280.D	1	06/17/11	SK	n/a	n/a	GGA666
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)	11.1	12	6.0	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	83%		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: STATE 1-A TP-20 (0-6")	
Lab Sample ID: D24302-2	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846-8015B SW846 3546	Percent Solids: 90.6
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07352.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
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)	2820	15	9.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	75%		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: STATE 1-A TP-20 (0-6") Lab Sample ID: D24302-2 Matrix: SO - Soil Project: Grynberg State 1-A	Date Sampled: 06/09/11 Date Received: 06/11/11 Percent Solids: 90.6
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Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	7.3	0.41	mg/kg	5	06/14/11	06/15/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	63.5	1.0	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.0	1.0	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	12.6	1.0	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	7.9	1.0	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	6.9	5.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.10	0.10	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	12.8	3.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.1	5.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.1	3.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	30.3	3.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1597
- (3) Instrument QC Batch: MA1600
- (4) Instrument QC Batch: MA1603
- (5) Prep QC Batch: MP4922
- (6) Prep QC Batch: MP4923
- (7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-20 (0-6")	Date Sampled: 06/09/11
Lab Sample ID: D24302-2	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 90.6
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	0.57	0.43	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	12.0	1.4	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	472		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	90.6		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	3470	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.75		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: STATE 1-A TP-20 (0-6")	
Lab Sample ID: D24302-2A	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 90.6
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	480	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	81.4	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	409	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-20 (0-6")	
Lab Sample ID: D24302-2A	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 90.6
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	4.54		ratio	1	06/15/11 18:46	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-10 (0-1')	
Lab Sample ID: D24302-3	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 83.7
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V16128.D	1	06/22/11	DC	n/a	n/a	V5V952
Run #2 ^a	3V12473.D	1	06/20/11	DC	n/a	n/a	V3V699

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.03 g	5.0 ml	100 ul
Run #2	5.00 g	5.0 ml	100 ul

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	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%	84%	70-130%
460-00-4	4-Bromofluorobenzene	94%	81%	70-130%
17060-07-0	1,2-Dichloroethane-D4	104%	87%	70-130%

(a) confirmation run

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

Report of Analysis

Client Sample ID: STATE 1-A TP-10 (0-1')	
Lab Sample ID: D24302-3	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546	Percent Solids: 83.7
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G04505.D	2	06/17/11	TMB	06/15/11	OP3869	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	29	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	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	59%		10-193%
321-60-8	2-Fluorobiphenyl	56%		20-138%
1718-51-0	Terphenyl-d14	78%		17-174%

(a) Elevated RL due to matrix interference.

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

Report of Analysis

3.5
3

Client Sample ID: STATE 1-A TP-10 (0-1')	
Lab Sample ID: D24302-3	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 83.7
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12281.D	1	06/17/11	SK	n/a	n/a	GGA666
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	14	6.9	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

3.5
3

Client Sample ID: STATE 1-A TP-10 (0-1')	
Lab Sample ID: D24302-3	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846-8015B SW846 3546	Percent Solids: 83.7
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07353.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
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)	21.0	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

35
3

Client Sample ID: STATE 1-A TP-10 (0-1')	Date Sampled: 06/09/11
Lab Sample ID: D24302-3	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 83.7
Project: Grynberg State 1-A	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	9.2	0.46	mg/kg	5	06/14/11	06/16/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	80.3	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	14.4	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	4.6	1.1	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	7.0	5.7	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.11	0.11	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	13.8	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.7	5.7	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.4	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	35.6	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1597
- (3) Instrument QC Batch: MA1600
- (4) Instrument QC Batch: MA1603
- (5) Prep QC Batch: MP4922
- (6) Prep QC Batch: MP4923
- (7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

35
3

Client Sample ID: STATE 1-A TP-10 (0-1')	Date Sampled: 06/09/11
Lab Sample ID: D24302-3	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 83.7
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	0.62	0.47	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	13.8	1.6	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	447		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	83.7		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	657	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.81		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: STATE 1-A TP-10 (0-1')	
Lab Sample ID: D24302-3A	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 83.7
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	46.2	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	10.3	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	99.1	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-10 (0-1')	
Lab Sample ID: D24302-3A	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 83.7
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	3.43		ratio	1	06/15/11 19:33	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-12 (0-1')	
Lab Sample ID: D24302-4	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 84.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V16129.D	1	06/22/11	DC	n/a	n/a	V5V952
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)	150	280	140	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	98%		70-130%
17060-07-0	1,2-Dichloroethane-D4	110%		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: STATE 1-A TP-12 (0-1')		
Lab Sample ID: D24302-4		Date Sampled: 06/09/11
Matrix: SO - Soil		Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546		Percent Solids: 84.0
Project: Grynberg State 1-A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G04506.D	2	06/17/11	TMB	06/15/11	OP3869	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	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	23.1	16	13	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	69%		10-193%
321-60-8	2-Fluorobiphenyl	68%		20-138%
1718-51-0	Terphenyl-d14	87%		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: STATE 1-A TP-12 (0-1')	
Lab Sample ID: D24302-4	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 84.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12282.D	1	06/17/11	SK	n/a	n/a	GGA666
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)	8.33	14	6.9	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	73%		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

37
3

Client Sample ID: STATE 1-A TP-12 (0-1')	Date Sampled: 06/09/11
Lab Sample ID: D24302-4	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 84.0
Method: SW846-8015B SW846 3546	
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07354.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	133	16	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	87%		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

37
3

Client Sample ID: STATE 1-A TP-12 (0-1')	Date Sampled: 06/09/11
Lab Sample ID: D24302-4	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 84.0
Project: Grynberg State 1-A	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	8.0	0.46	mg/kg	5	06/14/11	06/16/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	30.1	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	10.4	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	2.8	1.1	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	5.7	5.7	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.11	0.11	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	11.5	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.7	5.7	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.4	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	23.2	3.4	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1597
- (3) Instrument QC Batch: MA1600
- (4) Instrument QC Batch: MA1603
- (5) Prep QC Batch: MP4922
- (6) Prep QC Batch: MP4923
- (7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A TP-12 (0-1')	
Lab Sample ID: D24302-4	Date Sampled: 06/09/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 84.0
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 0.48	0.48	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	10.1	1.6	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	442		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	84		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	431	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	9.02		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: STATE 1-A TP-12 (0-1')	Date Sampled: 06/09/11
Lab Sample ID: D24302-4A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 84.0
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	38.1	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	6.28	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	49.8	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID:	STATE 1-A TP-12 (0-1')	Date Sampled:	06/09/11
Lab Sample ID:	D24302-4A	Date Received:	06/11/11
Matrix:	SO - Soil	Percent Solids:	84.0
Project:	Grynberg State 1-A		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	1.97		ratio	1	06/15/11 19:39	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Report of Analysis

3.9
3

Client Sample ID: STATE 1-A SSW	
Lab Sample ID: D24302-5	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 90.7
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06662.D	1	06/20/11	DC	n/a	n/a	V6V342
Run #2							

Run #	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	60	26	ug/kg	
108-88-3	Toluene	129	120	60	ug/kg	
100-41-4	Ethylbenzene	ND	120	30	ug/kg	
1330-20-7	Xylene (total)	190	240	120	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	83%		70-130%
460-00-4	4-Bromofluorobenzene	90%		70-130%
17060-07-0	1,2-Dichloroethane-D4	82%		70-130%

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

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

Report of Analysis

Client Sample ID: STATE 1-A SSW	
Lab Sample ID: D24302-5	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546	Percent Solids: 90.7
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G04609.D	10	06/21/11	TMB	06/17/11	OP3893	E3G171
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	73	59	ug/kg	
120-12-7	Anthracene	ND	73	66	ug/kg	
56-55-3	Benzo(a)anthracene	ND	180	95	ug/kg	
50-32-8	Benzo(a)pyrene	ND	180	130	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	180	140	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	180	81	ug/kg	
218-01-9	Chrysene	ND	180	81	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	180	140	ug/kg	
206-44-0	Fluoranthene	ND	73	73	ug/kg	
86-73-7	Fluorene	ND	73	62	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	220	200	ug/kg	
91-20-3	Naphthalene	ND	73	70	ug/kg	
129-00-0	Pyrene	ND	73	70	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	69%		10-193%
321-60-8	2-Fluorobiphenyl	78%		20-138%
1718-51-0	Terphenyl-d14	94%		17-174%

(a) Dilution required 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

3.9
3

Client Sample ID: STATE 1-A SSW	
Lab Sample ID: D24302-5	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 90.7
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12283.D	1	06/17/11	SK	n/a	n/a	GGA666
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	12	6.0	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

3.9
3

Client Sample ID: STATE 1-A SSW	
Lab Sample ID: D24302-5	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846-8015B SW846 3546	Percent Solids: 90.7
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07355.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
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)	395	15	9.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		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: STATE 1-A SSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-5	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 90.7
Project: Grynberg State 1-A	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	14.2	0.44	mg/kg	5	06/14/11	06/16/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	134	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	11.0	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	8.5	1.1	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	11.9	5.5	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.11	0.11	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	12.7	3.3	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.5	5.5	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.3	3.3	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	33.4	3.3	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵

(1) Instrument QC Batch: MA1593

(2) Instrument QC Batch: MA1597

(3) Instrument QC Batch: MA1600

(4) Instrument QC Batch: MA1603

(5) Prep QC Batch: MP4922

(6) Prep QC Batch: MP4923

(7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A SSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-5	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 90.7
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	0.99	0.44	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	10.0	1.5	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	384		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	90.7		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	1160	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	9.64		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: STATE 1-A SSW	
Lab Sample ID: D24302-5A	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 90.7
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	19.4	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	4.42	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	246	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A SSW	
Lab Sample ID: D24302-5A	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
	Percent Solids: 90.7
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	13.1		ratio	1	06/15/11 19:46	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A NSW	
Lab Sample ID: D24302-6	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 89.0
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06663.D	1	06/20/11	DC	n/a	n/a	V6V342
Run #2							

Run #	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	62	27	ug/kg	
108-88-3	Toluene	ND	120	62	ug/kg	
100-41-4	Ethylbenzene	ND	120	31	ug/kg	
1330-20-7	Xylene (total)	ND	250	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	81%		70-130%
460-00-4	4-Bromofluorobenzene	89%		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: STATE 1-A NSW		
Lab Sample ID: D24302-6		Date Sampled: 06/10/11
Matrix: SO - Soil		Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546		Percent Solids: 89.0
Project: Grynberg State 1-A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G04610.D	10	06/21/11	TMB	06/17/11	OP3893	E3G171
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	75	60	ug/kg	
120-12-7	Anthracene	ND	75	67	ug/kg	
56-55-3	Benzo(a)anthracene	ND	190	97	ug/kg	
50-32-8	Benzo(a)pyrene	ND	190	130	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	190	140	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	190	82	ug/kg	
218-01-9	Chrysene	ND	190	82	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	190	140	ug/kg	
206-44-0	Fluoranthene	ND	75	75	ug/kg	
86-73-7	Fluorene	ND	75	64	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	220	210	ug/kg	
91-20-3	Naphthalene	ND	75	71	ug/kg	
129-00-0	Pyrene	ND	75	71	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		10-193%
321-60-8	2-Fluorobiphenyl	74%		20-138%
1718-51-0	Terphenyl-d14	81%		17-174%

(a) Dilution required 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: STATE 1-A NSW	
Lab Sample ID: D24302-6	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 89.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12284.D	1	06/17/11	SK	n/a	n/a	GGA666
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	12	6.2	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: STATE 1-A NSW	
Lab Sample ID: D24302-6	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846-8015B SW846 3546	Percent Solids: 89.0
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07356.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
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)	321	15	9.7	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	86%		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: STATE 1-A NSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-6	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.0
Project: Grynberg State 1-A	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	18.8	0.42	mg/kg	5	06/14/11	06/16/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	47.5	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	15.3	1.1	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	13.9	1.1	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	10.3	5.3	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.11	0.11	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	16.1	3.2	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.3	5.3	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.2	3.2	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	40.3	3.2	mg/kg	1	06/14/11	06/14/11 JY	SW846 6010B ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1597
- (3) Instrument QC Batch: MA1600
- (4) Instrument QC Batch: MA1603
- (5) Prep QC Batch: MP4922
- (6) Prep QC Batch: MP4923
- (7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A NSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-6	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.0
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	0.69	0.44	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	14.6	1.5	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	452		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	89		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	2580	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.89		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: STATE 1-A NSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-6A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.0
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	205	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	18.8	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	423	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A NSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-6A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.0
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	7.57		ratio	1	06/15/11 19:52	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A ESW	
Lab Sample ID: D24302-7	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 88.8
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06664.D	1	06/20/11	DC	n/a	n/a	V6V342
Run #2							

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

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	62	27	ug/kg	
108-88-3	Toluene	ND	120	62	ug/kg	
100-41-4	Ethylbenzene	ND	120	31	ug/kg	
1330-20-7	Xylene (total)	ND	250	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	82%		70-130%
460-00-4	4-Bromofluorobenzene	90%		70-130%
17060-07-0	1,2-Dichloroethane-D4	84%		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: STATE 1-A ESW		
Lab Sample ID: D24302-7		Date Sampled: 06/10/11
Matrix: SO - Soil		Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546		Percent Solids: 88.8
Project: Grynberg State 1-A		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G04611.D	1	06/21/11	TMB	06/17/11	OP3893	E3G171
Run #2							

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

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	7.5	6.0	ug/kg	
120-12-7	Anthracene	ND	7.5	6.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	19	9.7	ug/kg	
50-32-8	Benzo(a)pyrene	ND	19	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	19	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	19	8.2	ug/kg	
218-01-9	Chrysene	ND	19	8.2	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	19	14	ug/kg	
206-44-0	Fluoranthene	ND	7.5	7.5	ug/kg	
86-73-7	Fluorene	ND	7.5	6.4	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	22	21	ug/kg	
91-20-3	Naphthalene	ND	7.5	7.1	ug/kg	
129-00-0	Pyrene	ND	7.5	7.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	64%		10-193%
321-60-8	2-Fluorobiphenyl	57%		20-138%
1718-51-0	Terphenyl-d14	76%		17-174%

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

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

Report of Analysis

Client Sample ID: STATE 1-A ESW	
Lab Sample ID: D24302-7	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 88.8
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12285.D	1	06/17/11	SK	n/a	n/a	GGA666
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	12	6.2	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: STATE 1-A ESW	
Lab Sample ID: D24302-7	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846-8015B SW846 3546	Percent Solids: 88.8
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07357.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
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)	48.8	15	9.7	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	88%		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:	STATE 1-A ESW	Date Sampled:	06/10/11
Lab Sample ID:	D24302-7	Date Received:	06/11/11
Matrix:	SO - Soil	Percent Solids:	88.8
Project:	Grynberg State 1-A		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	17.1	0.44	mg/kg	5	06/14/11	06/16/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	52.3	1.1	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	14.1	1.1	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	20.0	1.1	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	13.6	5.5	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.099	0.099	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	21.1	3.3	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.5	5.5	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.3	3.3	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	52.9	3.3	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵

(1) Instrument QC Batch: MA1593

(2) Instrument QC Batch: MA1597

(3) Instrument QC Batch: MA1600

(4) Instrument QC Batch: MA1603

(5) Prep QC Batch: MP4922

(6) Prep QC Batch: MP4923

(7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A ESW	Date Sampled: 06/10/11
Lab Sample ID: D24302-7	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 88.8
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	0.88	0.45	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	13.2	1.6	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	461		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	88.8		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	7040	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.89		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: STATE 1-A ESW	Date Sampled: 06/10/11
Lab Sample ID: D24302-7A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 88.8
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	286	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	211	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	1380	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A ESW	Date Sampled: 06/10/11
Lab Sample ID: D24302-7A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 88.8
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	15.1		ratio	1	06/15/11 19:59	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A WSW	
Lab Sample ID: D24302-8	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8260B	Percent Solids: 89.7
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V06665.D	1	06/20/11	DC	n/a	n/a	V6V342
Run #2							

Run #	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	61	27	ug/kg	
108-88-3	Toluene	ND	120	61	ug/kg	
100-41-4	Ethylbenzene	ND	120	31	ug/kg	
1330-20-7	Xylene (total)	ND	240	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	82%		70-130%
460-00-4	4-Bromofluorobenzene	91%		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: STATE 1-A WSW	
Lab Sample ID: D24302-8	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8270C BY SIM SW846 3546	Percent Solids: 89.7
Project: Grynberg State 1-A	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G04612.D	1	06/21/11	TMB	06/17/11	OP3893	E3G171
Run #2							

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

COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	7.4	5.9	ug/kg	
120-12-7	Anthracene	ND	7.4	6.7	ug/kg	
56-55-3	Benzo(a)anthracene	ND	19	9.6	ug/kg	
50-32-8	Benzo(a)pyrene	ND	19	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	19	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	19	8.1	ug/kg	
218-01-9	Chrysene	ND	19	8.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	19	14	ug/kg	
206-44-0	Fluoranthene	ND	7.4	7.4	ug/kg	
86-73-7	Fluorene	ND	7.4	6.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	22	20	ug/kg	
91-20-3	Naphthalene	ND	7.4	7.0	ug/kg	
129-00-0	Pyrene	ND	7.4	7.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	59%		10-193%
321-60-8	2-Fluorobiphenyl	54%		20-138%
1718-51-0	Terphenyl-d14	80%		17-174%

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

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

Report of Analysis

Client Sample ID: STATE 1-A WSW	
Lab Sample ID: D24302-8	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846 8015B	Percent Solids: 89.7
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA12286.D	1	06/17/11	SK	n/a	n/a	GGA666
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	12	6.1	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: STATE 1-A WSW	
Lab Sample ID: D24302-8	Date Sampled: 06/10/11
Matrix: SO - Soil	Date Received: 06/11/11
Method: SW846-8015B SW846 3546	Percent Solids: 89.7
Project: Grynberg State 1-A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD07358.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
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)	53.7	15	9.6	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: STATE 1-A WSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-8	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.7
Project: Grynberg State 1-A	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	11.0	0.42	mg/kg	5	06/14/11	06/16/11 GJ	SW846 6020 ²	SW846 3050B ⁶
Barium	36.4	1.1	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 1.1	1.1	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Chromium	17.1	1.1	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Copper	11.0	1.1	mg/kg	1	06/14/11	06/16/11 JM	SW846 6010B ³	SW846 3050B ⁵
Lead	8.0	5.3	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.10	0.10	mg/kg	1	06/17/11	06/17/11 JY	SW846 7471A ⁴	SW846 7471A ⁷
Nickel	14.6	3.2	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 5.3	5.3	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 3.2	3.2	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵
Zinc	34.3	3.2	mg/kg	1	06/14/11	06/15/11 JY	SW846 6010B ¹	SW846 3050B ⁵

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1597
- (3) Instrument QC Batch: MA1600
- (4) Instrument QC Batch: MA1603
- (5) Prep QC Batch: MP4922
- (6) Prep QC Batch: MP4923
- (7) Prep QC Batch: MP4959

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A WSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-8	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.7
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	1.5	0.44	mg/kg	1	06/22/11 16:30	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	15.6	1.5	mg/kg	1	06/22/11 16:30	AMA	SW846 3060/7196A M
Redox Potential Vs H2	499		mv	1	06/13/11	CJ	ASTM D1498-76M
Solids, Percent	89.7		%	1	06/15/11	SWT	SM19 2540B M
Specific Conductivity	4180	1.0	umhos/cm	1	06/15/11	CJ	DEPT.OF AG, BOOK N9
pH	8.41		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: STATE 1-A WSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-8A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.7
Project: Grynberg State 1-A	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	402	2.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Magnesium	91.5	1.0	mg/l	1	06/14/11	06/15/11 JY	SW846 6010B ¹	EPA 200.7 ³
Sodium	644	2.0	mg/l	1	06/15/11	06/15/11 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA1593
- (2) Instrument QC Batch: MA1598
- (3) Prep QC Batch: MP4927

RL = Reporting Limit

Report of Analysis

Client Sample ID: STATE 1-A WSW	Date Sampled: 06/10/11
Lab Sample ID: D24302-8A	Date Received: 06/11/11
Matrix: SO - Soil	Percent Solids: 89.7
Project: Grynberg State 1-A	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	7.54		ratio	1	06/15/11 20:08	JM	USDA HANDBOOK 60

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

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D24302

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: GYNBERG STATE 1-A(011_1181_100_10000)

Airbill #'s: Fedex

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

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

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

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

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

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

Comments

4.1
4

GC/MS Volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V340-MB	6V06593.D	1	06/18/11	DC	n/a	n/a	V6V340

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-1, D24302-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.44	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.50	ug/kg	
108-88-3	Toluene	ND	2.0	1.0	ug/kg	
1330-20-7	Xylene (total)	ND	4.0	2.0	ug/kg	

CAS No.	Surrogate Recoveries	Limits
2037-26-5	Toluene-D8	93% 70-130%
460-00-4	4-Bromofluorobenzene	97% 70-130%
17060-07-0	1,2-Dichloroethane-D4	87% 70-130%

Method Blank Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V699-MB	3V12462A.D 1		06/20/11	DC	n/a	n/a	V3V699

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-3

CAS No.	Compound	Result	RL	MDL	Units	Q
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CAS No.	Surrogate Recoveries	Result	Limits
2037-26-5	Toluene-D8	86%	70-130%
460-00-4	4-Bromofluorobenzene	80%	70-130%
17060-07-0	1,2-Dichloroethane-D4	84%	70-130%

Method Blank Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V342-MB	6V06652.D	1	06/20/11	DC	n/a	n/a	V6V342

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-5, D24302-6, D24302-7, D24302-8

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	100	ug/kg	

CAS No.	Surrogate Recoveries	Limits
2037-26-5	Toluene-D8	92% 70-130%
460-00-4	4-Bromofluorobenzene	96% 70-130%
17060-07-0	1,2-Dichloroethane-D4	96% 70-130%

Method Blank Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V952-MB	5V16116.D	1	06/22/11	DC	n/a	n/a	V5V952

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-3, D24302-4

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	100	ug/kg	

CAS No.	Surrogate Recoveries	Limits
2037-26-5	Toluene-D8	99% 70-130%
460-00-4	4-Bromofluorobenzene	95% 70-130%
17060-07-0	1,2-Dichloroethane-D4	100% 70-130%

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V340-BS	6V06594.D	1	06/18/11	DC	n/a	n/a	V6V340

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-1, D24302-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	49.6	99	68-130
100-41-4	Ethylbenzene	50	51.8	104	70-130
108-88-3	Toluene	50	46.2	92	70-130
1330-20-7	Xylene (total)	100	94.9	95	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	92%	70-130%
460-00-4	4-Bromofluorobenzene	111%	70-130%
17060-07-0	1,2-Dichloroethane-D4	85%	70-130%

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V699-BS	3V12463B.D 1		06/20/11	DC	n/a	n/a	V3V699

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
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CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	87%	70-130%
460-00-4	4-Bromofluorobenzene	80%	70-130%
17060-07-0	1,2-Dichloroethane-D4	87%	70-130%

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V342-BS	6V06653.D	1	06/20/11	DC	n/a	n/a	V6V342

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	44.1	88	68-130
100-41-4	Ethylbenzene	50	46.5	93	70-130
108-88-3	Toluene	50	41.4	83	70-130
1330-20-7	Xylene (total)	100	84.8	85	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	88%	70-130%
460-00-4	4-Bromofluorobenzene	103%	70-130%
17060-07-0	1,2-Dichloroethane-D4	84%	70-130%

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V952-BS	5V16117.D	1	06/22/11	DC	n/a	n/a	V5V952

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-3, D24302-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	60.4	121	68-130
100-41-4	Ethylbenzene	50	62.6	125	70-130
108-88-3	Toluene	50	61.4	123	70-130
1330-20-7	Xylene (total)	100	115	115	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	109%	70-130%
17060-07-0	1,2-Dichloroethane-D4	109%	70-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D24242-1MS	6V06596.D	1	06/18/11	DC	n/a	n/a	V6V340
D24242-1MSD	6V06597.D	1	06/18/11	DC	n/a	n/a	V6V340
D24242-1	6V06595.D	1	06/18/11	DC	n/a	n/a	V6V340

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-1, D24302-2

CAS No.	Compound	D24242-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	2860	3270	114	3380	118	3	55-140/30
100-41-4	Ethylbenzene	ND	2860	3570	125	3650	127	2	56-139/30
108-88-3	Toluene	ND	2860	3100	108	3270	114	5	57-144/30
1330-20-7	Xylene (total)	ND	5730	6640	116	6770	118	2	51-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D24242-1	Limits
2037-26-5	Toluene-D8	91%	90%	90%	70-130%
460-00-4	4-Bromofluorobenzene	109%	105%	96%	70-130%
17060-07-0	1,2-Dichloroethane-D4	84%	79%	85%	70-130%

5.3.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D24562-1MS	6V06655.D	1	06/20/11	DC	n/a	n/a	V6V342
D24562-1MSD	6V06656.D	1	06/20/11	DC	n/a	n/a	V6V342
D24562-1	6V06654.D	1	06/20/11	DC	n/a	n/a	V6V342

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	D24562-1 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	28.5	J	2500	2460	97	2530	100	3	55-140/30
100-41-4	Ethylbenzene	ND		2500	2550	102	2600	104	2	56-139/30
108-88-3	Toluene	221		2500	2420	88	2510	92	4	57-144/30
1330-20-7	Xylene (total)	323		4990	5080	95	5240	98	3	51-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D24562-1	Limits
2037-26-5	Toluene-D8	84%	85%	91%	70-130%
460-00-4	4-Bromofluorobenzene	102%	98%	96%	70-130%
17060-07-0	1,2-Dichloroethane-D4	88%	83%	91%	70-130%

5.3.2
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D24302-3MS	3V12474.D	1	06/20/11	DC	n/a	n/a	V3V699
D24302-3MSD	3V12475.D	1	06/20/11	DC	n/a	n/a	V3V699
D24302-3 ^a	3V12473.D	1	06/20/11	DC	n/a	n/a	V3V699

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-3

CAS No.	Compound	D24302-3 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
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CAS No.	Surrogate Recoveries	MS	MSD	D24302-3	Limits
2037-26-5	Toluene-D8	83%	84%	84%	70-130%
460-00-4	4-Bromofluorobenzene	87%	87%	81%	70-130%
17060-07-0	1,2-Dichloroethane-D4	86%	88%	87%	70-130%

(a) confirmation run

5.3.3
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D24436-1MS	5V16120.D	1	06/22/11	DC	n/a	n/a	V5V952
D24436-1MSD	5V16121.D	1	06/22/11	DC	n/a	n/a	V5V952
D24436-1	5V16119.D	1	06/22/11	DC	n/a	n/a	V5V952

The QC reported here applies to the following samples:

Method: SW846 8260B

D24302-3, D24302-4

CAS No.	Compound	D24436-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	2610	3460	133	3410	131	1	55-140/30
100-41-4	Ethylbenzene	1220	2610	3290	79	3230	77	2	56-139/30
108-88-3	Toluene	ND	2610	3100	119	3030	116	2	57-144/30
1330-20-7	Xylene (total)	1800	5220	7480	109	7410	108	1	51-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D24436-1	Limits
2037-26-5	Toluene-D8	89%	87%	92%	70-130%
460-00-4	4-Bromofluorobenzene	113%	113%	102%	70-130%
17060-07-0	1,2-Dichloroethane-D4	118%	113%	125%	70-130%

5.3.4
5

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: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3869-MB	3G04480.D	1	06/16/11	TMB	06/15/11	OP3869	E3G168

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D24302-1, D24302-2, D24302-3, D24302-4

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	79% 10-193%
321-60-8	2-Fluorobiphenyl	74% 20-138%
1718-51-0	Terphenyl-d14	105% 17-174%

Method Blank Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3893-MB	3G04570.D	1	06/20/11	TMB	06/17/11	OP3893	E3G170

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D24302-5, D24302-6, D24302-7, D24302-8

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	80%	10-193%
321-60-8	2-Fluorobiphenyl	76%	20-138%
1718-51-0	Terphenyl-d14	96%	17-174%

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3869-BS	3G04481.D	1	06/16/11	TMB	06/15/11	OP3869	E3G168

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D24302-1, D24302-2, D24302-3, D24302-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	60.3	72	40-136
120-12-7	Anthracene	83.3	66.3	80	40-141
56-55-3	Benzo(a)anthracene	83.3	63.4	76	38-143
50-32-8	Benzo(a)pyrene	83.3	67.5	81	39-145
205-99-2	Benzo(b)fluoranthene	83.3	72.3	87	38-151
207-08-9	Benzo(k)fluoranthene	83.3	65.3	78	38-147
218-01-9	Chrysene	83.3	64.6	78	39-137
53-70-3	Dibenzo(a,h)anthracene	83.3	58.1	70	35-139
206-44-0	Fluoranthene	83.3	63.4	76	34-132
86-73-7	Fluorene	83.3	63.8	77	41-136
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	58.3	70	31-144
91-20-3	Naphthalene	83.3	60.3	72	36-130
129-00-0	Pyrene	83.3	72.8	87	29-157

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	76%	10-193%
321-60-8	2-Fluorobiphenyl	69%	20-138%
1718-51-0	Terphenyl-d14	96%	17-174%

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3893-BS	3G04571.D	1	06/20/11	TMB	06/17/11	OP3893	E3G170

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	53.7	64	40-136
120-12-7	Anthracene	83.3	60.8	73	40-141
56-55-3	Benzo(a)anthracene	83.3	63.5	76	38-143
50-32-8	Benzo(a)pyrene	83.3	68.1	82	39-145
205-99-2	Benzo(b)fluoranthene	83.3	75.8	91	38-151
207-08-9	Benzo(k)fluoranthene	83.3	70.7	85	38-147
218-01-9	Chrysene	83.3	70.2	84	39-137
53-70-3	Dibenzo(a,h)anthracene	83.3	59.3	71	35-139
206-44-0	Fluoranthene	83.3	66.0	79	34-132
86-73-7	Fluorene	83.3	53.0	64	41-136
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	56.1	67	31-144
91-20-3	Naphthalene	83.3	54.4	65	36-130
129-00-0	Pyrene	83.3	61.5	74	29-157

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	71%	10-193%
321-60-8	2-Fluorobiphenyl	68%	20-138%
1718-51-0	Terphenyl-d14	88%	17-174%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3869-MS ^a	3G04483.D	25	06/16/11	TMB	06/15/11	OP3869	E3G168
OP3869-MSD ^a	3G04484.D	25	06/16/11	TMB	06/15/11	OP3869	E3G168
D24345-1 ^a	3G04482.D	25	06/16/11	TMB	06/15/11	OP3869	E3G168

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D24302-1, D24302-2, D24302-3, D24302-4

CAS No.	Compound	D24345-1 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND	99.7	ND	0* b	ND	0* b	nc	20-151/30	
120-12-7	Anthracene	ND	99.7	ND	0* b	ND	0* b	nc	25-149/30	
56-55-3	Benzo(a)anthracene	ND	99.7	ND	0* b	ND	0* b	nc	22-157/30	
50-32-8	Benzo(a)pyrene	ND	99.7	ND	0* b	ND	0* b	nc	23-153/30	
205-99-2	Benzo(b)fluoranthene	ND	99.7	ND	0* b	ND	0* b	nc	22-161/30	
207-08-9	Benzo(k)fluoranthene	ND	99.7	ND	0* b	ND	0* b	nc	17-161/30	
218-01-9	Chrysene	ND	99.7	ND	0* b	ND	0* b	nc	16-159/30	
53-70-3	Dibenzo(a,h)anthracene	ND	99.7	ND	0* b	ND	0* b	nc	21-154/30	
206-44-0	Fluoranthene	ND	99.7	ND	0* b	ND	0* b	nc	16-140/30	
86-73-7	Fluorene	ND	99.7	ND	0* b	ND	0* b	nc	15-153/30	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	99.7	ND	0* b	ND	0* b	nc	21-159/30	
91-20-3	Naphthalene	ND	99.7	ND	0* b	ND	0* b	nc	10-176/30	
129-00-0	Pyrene	ND	99.7	ND	0* b	ND	0* b	nc	10-200/30	

CAS No.	Surrogate Recoveries	MS	MSD	D24345-1	Limits
4165-60-0	Nitrobenzene-d5	43%	50%	47%	10-193%
321-60-8	2-Fluorobiphenyl	51%	58%	56%	20-138%
1718-51-0	Terphenyl-d14	63%	71%	71%	17-174%

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

(b) Outside control limits due to dilution.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3893-MS	3G04606.D	25	06/21/11	TMB	06/17/11	OP3893	E3G171
OP3893-MSD	3G04607.D	25	06/21/11	TMB	06/17/11	OP3893	E3G171
D24515-1 ^a	3G04572.D	25	06/20/11	TMB	06/17/11	OP3893	E3G170

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	D24515-1 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND	83.3	ND	0* ^b	ND	0* ^b	nc	20-151/30	
120-12-7	Anthracene	ND	83.3	ND	0* ^b	ND	0* ^b	nc	25-149/30	
56-55-3	Benzo(a)anthracene	ND	83.3	357	428* ^b	293	352* ^b	20 ^b	22-157/30	
50-32-8	Benzo(a)pyrene	ND	83.3	ND	0* ^b	ND	0* ^b	nc	23-153/30	
205-99-2	Benzo(b)fluoranthene	ND	83.3	466	559* ^b	372	446* ^b	22 ^b	22-161/30	
207-08-9	Benzo(k)fluoranthene	ND	83.3	245	294* ^b	191	229* ^b	25 ^b	17-161/30	
218-01-9	Chrysene	ND	83.3	440	528* ^b	346	415* ^b	24 ^b	16-159/30	
53-70-3	Dibenzo(a,h)anthracene	ND	83.3	ND	0* ^b	ND	0* ^b	nc	21-154/30	
206-44-0	Fluoranthene	ND	83.3	608	730* ^b	490	588* ^b	21 ^b	16-140/30	
86-73-7	Fluorene	ND	83.3	ND	0* ^b	ND	0* ^b	nc	15-153/30	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	83.3	ND	0* ^b	ND	0* ^b	nc	21-159/30	
91-20-3	Naphthalene	ND	83.3	172	206* ^b	162	194* ^b	6 ^b	10-176/30	
129-00-0	Pyrene	ND	83.3	289	347* ^b	209	251* ^b	32* ^b	10-200/30	

CAS No.	Surrogate Recoveries	MS	MSD	D24515-1	Limits
4165-60-0	Nitrobenzene-d5	53%	70%	59%	10-193%
321-60-8	2-Fluorobiphenyl	56%	79%	68%	20-138%
1718-51-0	Terphenyl-d14	73%	79%	69%	17-174%

(a) Phenathrene-d10 response outside of control limits; ISTD does not reference any reported target analytes.

(b) Outside control limits due to dilution.

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: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA666-MB	GA12265.D	1	06/16/11	SK	n/a	n/a	GGA666

The QC reported here applies to the following samples:

Method: SW846 8015B

D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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	76% 60-140%

7.1.1
7

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA666-BS	GA12266.D	1	06/16/11	SK	n/a	n/a	GGA666

The QC reported here applies to the following samples:

Method: SW846 8015B

D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	105	95	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	92%	60-140%

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D24532-1MS	GA12270.D	1	06/17/11	SK	n/a	n/a	GGA666
D24532-1MSD	GA12271.D	1	06/17/11	SK	n/a	n/a	GGA666
D24532-1	GA12269.D	1	06/17/11	SK	n/a	n/a	GGA666

The QC reported here applies to the following samples: Method: SW846 8015B

D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	D24532-1 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	138	128	93	134	97	5	62-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D24532-1	Limits
120-82-1	1,2,4-Trichlorobenzene	90%	90%	74%	60-140%

7.3.1
7

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: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3913-MB	FD07347.D	1	06/23/11	JB	06/21/11	OP3913	GFD321

The QC reported here applies to the following samples: **Method:** SW846-8015B

D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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	94% 61-142%

Blank Spike Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3913-BS	FD07348.D	1	06/23/11	JB	06/21/11	OP3913	GFD321

The QC reported here applies to the following samples:

Method: SW846-8015B

D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	489	73	60-130

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

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24302
Account: CORCCOGJ Olsson Associates
Project: Grynberg State 1-A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3913-MS	FD07349.D	1	06/23/11	JB	06/21/11	OP3913	GFD321
OP3913-MSD	FD07350.D	1	06/24/11	JB	06/21/11	OP3913	GFD321
D24302-1	FD07351.D	1	06/24/11	JB	06/21/11	OP3913	GFD321

The QC reported here applies to the following samples: Method: SW846-8015B

D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

CAS No.	Compound	D24302-1 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	156	757	719	74	676	69	6	24-157/35

CAS No.	Surrogate Recoveries	MS	MSD	D24302-1	Limits
84-15-1	o-Terphenyl	89%	77%	80%	61-142%

8.3.1
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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: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4922
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 06/14/11

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	0.070	<1.0
Beryllium	1.0	.044	.1		
Boron	5.0	.48	.48		
Cadmium	1.0	.027	.27	0.020	<1.0
Calcium	40	.96	1.1		
Chromium	1.0	.018	.031	0.010	<1.0
Cobalt	0.50	.035	.035		
Copper	1.0	.085	.16	-0.17	<1.0
Iron	7.0	.34	2		
Lead	5.0	.16	.21	-0.090	<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	-0.040	<3.0
Phosphorus	10	1.1	1.2		
Potassium	200	5.5	9.2		
Selenium	5.0	.38	.5	-0.40	<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	0.15	<3.0

Associated samples MP4922: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4922
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4922
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 06/14/11

Metal	D24251-1 Original MS		SpikeLot MPICPALL % Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	134	286	213	71.4N(a) 75-125
Beryllium				
Boron	anr			
Cadmium	0.19	40.7	53.2	76.1 75-125
Calcium	anr			
Chromium	28.2	66.1	53.2	71.2N(a) 75-125
Cobalt				
Copper	10.7	53.6	53.2	80.6 75-125
Iron				
Lead	11.6	90.2	106	73.9N(a) 75-125
Lithium				
Magnesium				
Manganese	anr			
Molybdenum	anr			
Nickel	13.4	51.3	53.2	71.2N(a) 75-125
Phosphorus	anr			
Potassium	anr			
Selenium	0.49	84.4	106	78.8 75-125
Silicon				
Silver	0.16	17.2	21.3	80.1 75-125
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	40.6	76.6	53.2	67.7N(a) 75-125

Associated samples MP4922: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4922
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 recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4922
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 06/14/11

Metal	D24251-1 Original	MSD	SpikeLot MPICPAL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	134	309	217	80.7	7.7	20
Beryllium						
Boron	anr					
Cadmium	0.19	44.5	54.2	81.7	8.9	20
Calcium	anr					
Chromium	28.2	72.2	54.2	81.2	8.8	20
Cobalt						
Copper	10.7	59.0	54.2	89.1	9.6	20
Iron						
Lead	11.6	98.3	108	80.0	8.6	20
Lithium						
Magnesium						
Manganese	anr					
Molybdenum	anr					
Nickel	13.4	55.2	54.2	77.1	7.3	20
Phosphorus	anr					
Potassium	anr					
Selenium	0.49	91.9	108	84.3	8.5	20
Silicon						
Silver	0.16	18.9	21.7	86.4	9.4	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	40.6	81.5	54.2	75.4	6.2	20

Associated samples MP4922: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4922
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4922
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 06/14/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	176	200	88.0	80-120
Beryllium				
Boron	anr			
Cadmium	44.8	50	89.6	80-120
Calcium	anr			
Chromium	45.2	50	90.4	80-120
Cobalt				
Copper	45.1	50	90.2	80-120
Iron				
Lead	90.8	100	90.8	80-120
Lithium				
Magnesium				
Manganese	anr			
Molybdenum	anr			
Nickel	44.7	50	89.4	80-120
Phosphorus	anr			
Potassium	anr			
Selenium	95.1	100	95.1	80-120
Silicon				
Silver	18.8	20	94.0	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	44.8	50	89.6	80-120

Associated samples MP4922: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.1.3
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SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4922
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4922
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 06/14/11

Metal	D24251-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	1180	1360	15.0*(a)	0-10
Beryllium				
Boron	anr			
Cadmium	1.70	0.00	100.0(b)	0-10
Calcium	anr			
Chromium	248	291	17.0*(a)	0-10
Cobalt				
Copper	90.4	94.5	1.0	0-10
Iron				
Lead	102	103	0.8	0-10
Lithium				
Magnesium				
Manganese	anr			
Molybdenum	anr			
Nickel	118	139	18.1*(a)	0-10
Phosphorus	anr			
Potassium	anr			
Selenium	4.30	0.00	100.0(b)	0-10
Silicon				
Silver	1.40	4.00	185.7(b)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	357	447	25.1*(a)	0-10

Associated samples MP4922: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4922
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: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4923
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 06/14/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	1.2		
Antimony	0.20	.001	.0095		
Arsenic	0.40	.049	.22	-0.15	<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 MP4923: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4923
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 06/14/11

Metal	D24251-1 Original MS		SpikeLot MPICPALL % Rec	QC Limits
Aluminum				
Antimony				
Arsenic	1.6	91.8	106	84.8 60-119
Barium	anr			
Beryllium				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP4923: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4923
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 06/14/11

Metal	D24251-1 Original MSD		SpikeLot MPICPAL % Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	1.6	101	108	91.7	9.5	20
Barium	anr					
Beryllium						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt						
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel						
Phosphorus						
Potassium	anr					
Selenium	anr					
Silver	anr					
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP4923: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4923
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 06/14/11

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	93.6	100	93.6	80-120
Barium	anr			
Beryllium				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP4923: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.2.3
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SERIAL DILUTION RESULTS SUMMARY

Login Number: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4923
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 06/14/11

Metal	D24251-1 Original	SDL 5:25	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	13.8	14.3	3.7	0-10
Barium	anr			
Beryllium				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium	anr			
Selenium	anr			
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP4923: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.2.4
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BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4927
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date: 06/15/11

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	15.0	<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	-3.5	<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	-200	<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 MP4927: D24302-1A, D24302-2A, D24302-3A, D24302-4A, D24302-5A, D24302-6A, D24302-7A, D24302-8A

Results < IDL are shown as zero for calculation purposes

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4927
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(*) Outside of QC limits
(anr) Analyte not requested

9.3.1

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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4927
 Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
 Units: ug/l

Prep Date: 06/15/11

Metal	D24302-2A Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	480000	573000	125000	74.4N(a)	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	81400	205000	125000	98.9	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	409000	510000	125000	80.8	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP4927: D24302-1A, D24302-2A, D24302-3A, D24302-4A, D24302-5A, D24302-6A, D24302-7A, D24302-8A

Results < IDL are shown as zero for calculation purposes

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4927
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

- (*) Outside of QC limits
- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4927
 Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
 Units: ug/l

Prep Date: 06/15/11

Metal	D24302-2A Original MSD		SpikeLot MPICPAL % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	480000	630000	125000	120.0	9.5	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	81400	215000	125000	106.9	4.8	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	409000	560000	125000	120.8	9.3	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP4927: D24302-1A, D24302-2A, D24302-3A, D24302-4A, D24302-5A, D24302-6A, D24302-7A, D24302-8A

Results < IDL are shown as zero for calculation purposes

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4927
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(*) 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: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4927
 Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
 Units: ug/l

Prep Date: 06/15/11

Metal	BSP Result	SpikeLot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	133000	125000	106.4	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	129000	125000	103.2	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	133000	125000	106.4	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP4927: D24302-1A, D24302-2A, D24302-3A, D24302-4A, D24302-5A, D24302-6A, D24302-7A, D24302-8A

Results < IDL are shown as zero for calculation purposes

9.3.3
9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4927
Matrix Type: AQUEOUS

Methods: SW846 6010B, USDA HANDBOOK 60
Units: ug/l

Prep Date:

Metal

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4959
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 06/17/11

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.10	.0011	.013	-0.0026	<0.10

Associated samples MP4959: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4959
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 06/17/11

Metal	D24302-1 Original MS	Spike HGWSR1	lot % Rec	QC Limits
-------	-------------------------	-----------------	--------------	--------------

Mercury 0.013 0.41 0.406 97.8 85-115

Associated samples MP4959: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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: D24302
 Account: CORCCOGJ - Olsson Associates
 Project: Grynberg State 1-A

QC Batch ID: MP4959
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 06/17/11

Metal	D24302-1 Original	MSD	Spike lot	HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.013	0.44	0.429	99.6	7.1	20	

Associated samples MP4959: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

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: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

QC Batch ID: MP4959
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 06/17/11

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.35	0.4	87.5	80-120

Associated samples MP4959: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

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: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP4669/GN10033			umhos/cm	9961	9870	99.1	90-110%
Specific Conductivity	GP4670/GN10034			umhos/cm	9961	9170	92.1	90-110%
pH	GN9986			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:

Batch GN9986: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

Batch GP4669: D24302-1, D24302-2

Batch GP4670: D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

(*) Outside of QC limits

10.1
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DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D24302
Account: CORCCOGJ - Olsson Associates
Project: Grynberg State 1-A

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Redox Potential Vs H2	GN9987	D24302-1	mv	489	494	1.0	0-20%

Associated Samples:

Batch GN9987: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

(*) Outside of QC limits

10.2
10

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D24302

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 6/14/2011

Delivery Method:

Client Service Action Required at Login: No

Project: N/A

No. Coolers: 1

Airbill #'s: N/A

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

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

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

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

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

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

Comments

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: D24302
 Account: ALMS - Accutest Mountain States
 Project: CORCCOGJ: Grynberg State 1-A (011-1181_100_100001)

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP13126/GN35249	0.40	0.0	mg/kg	12	11.6	96.7	80-120%
Chromium, Hexavalent	GP13126/GN35249			mg/kg	715	743	103.9	80-120%

Associated Samples:

Batch GP13126: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

(*) Outside of QC limits

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BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D24302
Account: ALMS - Accutest Mountain States
Project: CORCCOGJ: Grynberg State 1-A (011-1181_100_100001)

Analyte	Batch ID	Units	Spike Amount	BSD Result	RPD	QC Limit
Chromium, Hexavalent	GP13126/GN35249	mg/kg	12	11.8	1.6	

Associated Samples:

Batch GP13126: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8
(*) Outside of QC limits

12.2
12

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D24302
Account: ALMS - Accutest Mountain States
Project: CORCCOGJ: Grynberg State 1-A (011-1181_100_100001)

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP13126/GN35249	D24302-4	mg/kg	0.33	0.33	0.0	0-20%

Associated Samples:

Batch GP13126: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8
(*) Outside of QC limits

12.3
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MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D24302
Account: ALMS - Accutest Mountain States
Project: CORCCOGJ: Grynberg State 1-A (011-1181_100_100001)

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP13126/GN35249	D24302-4	mg/kg	0.33	14.2	14.6	100.3	75-125%
Chromium, Hexavalent	GP13126/GN35249	D24302-4	mg/kg	0.33	1030	1110	107.9	75-125%

Associated Samples:

Batch GP13126: D24302-1, D24302-2, D24302-3, D24302-4, D24302-5, D24302-6, D24302-7, D24302-8

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

12.4
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Technical Report for

Olsson Associates

Hiawatha

State 1-A 011-1181

Accutest Job Number: D24913

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: **13**



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)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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Sample Summary

Olsson Associates

Job No: D24913

Hiawatha

Project No: State 1-A 011-1181

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
D24913-1	06/28/11	10:15 JPK	06/29/11	SO	Soil	STATE 1-A TP-20

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Olsson Associates

Job No D24913

Site: Hiawatha

Report Dat 7/5/2011 2:49:06 PM

On 06/29/2011, 1 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 D24913 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.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP3983
------------------	-------------------------

- All samples were extracted 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) D24956-1MS, D24956-1MSD were used as the QC samples indicated.
- The matrix spike and matrix spike duplicate (MS/MSD) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- Sample(s) OP3983-MS, OP3983-MSD have surrogates outside control limits. Outside control limits due to dilution.

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.



Sample Results

Report of Analysis

Report of Analysis

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3

Client Sample ID: STATE 1-A TP-20	
Lab Sample ID: D24913-1	Date Sampled: 06/28/11
Matrix: SO - Soil	Date Received: 06/29/11
Method: SW846-8015B SW846 3546	Percent Solids: 94.3
Project: Hiawatha	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI03020.D	1	06/30/11	JB	06/30/11	OP3983	GFI185
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)	41.2	14	9.2	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

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D24913

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 STATE 1-A 011-1181

Airbill #'s: Fedex

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

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

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

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

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

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

Comments

4.1
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GC Semi-volatiles

5

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D24913
Account: CORCCOGJ Olsson Associates
Project: Hiawatha

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3983-MB	FI03011.D	1	06/30/11	JB	06/30/11	OP3983	GFI185

The QC reported here applies to the following samples:

Method: SW846-8015B

D24913-1

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	96% 61-142%

Blank Spike Summary

Job Number: D24913
Account: CORCCOGJ Olsson Associates
Project: Hiawatha

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3983-BS	FI03012.D	1	06/30/11	JB	06/30/11	OP3983	GFI185

The QC reported here applies to the following samples:

Method: SW846-8015B

D24913-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	568	85	60-130

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

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D24913
Account: CORCCOGJ Olsson Associates
Project: Hiawatha

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP3983-MS	FI03015.D	20	06/30/11	JB	06/30/11	OP3983	GFI185
OP3983-MSD	FI03016.D	20	06/30/11	JB	06/30/11	OP3983	GFI185
D24956-1	FI03014.D	20	06/30/11	JB	06/30/11	OP3983	GFI185

The QC reported here applies to the following samples:

Method: SW846-8015B

D24913-1

CAS No.	Compound	D24956-1 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	33100	1040	31800	-125* a	30900	-212* a	3	24-157/35

CAS No.	Surrogate Recoveries	MS	MSD	D24956-1	Limits
84-15-1	o-Terphenyl	0%* b	0%* b	0%* b	61-142%

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Outside control limits due to dilution.

5.3.1
5

Technical Report for

Olsson Associates

Hiawatha

Deep 4-36 011-0383

Accutest Job Number: D24914

Sampling Date: 06/28/11

Report to:

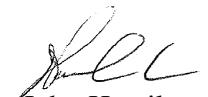
Olsson Associates
826 21 1/2 Road
Grand Junction, CO 81505
tdobransky@oaconsulting.com

ATTN: Tim Dobransky

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



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)

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Test results relate only to samples analyzed.

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4.1: Chain of Custody	10
Section 5: Metals Analysis - QC Data Summaries	12
5.1: Prep QC MP5099: As	13

1

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Sample Summary

Olsson Associates

Job No: D24914

Hiawatha

Project No: Deep 4-36 011-0383

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
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.



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: DEEP 4-36 BG6	Date Sampled: 06/28/11
Lab Sample ID: D24914-1	Date Received: 06/29/11
Matrix: SO - Soil	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	Date Sampled: 06/28/11
Lab Sample ID: D24914-2	Date Received: 06/29/11
Matrix: SO - Soil	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	Date Sampled: 06/28/11
Lab Sample ID: D24914-3	Date Received: 06/29/11
Matrix: SO - Soil	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

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

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

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

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

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

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

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

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

Comments

4.1
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Metals Analysis

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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
 Matrix Type: SOLID

Methods: SW846 6020
 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

5.1.2
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MATRIX SPIKE AND DUPLICATE RESULTS 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	D24957-1 Original MSD	Spikelot MPICPAL % 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

5.1.2
5

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	QC
	Original	Limits

Metal	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.

5.1.4
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