

State of Colorado  
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

#7610

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: 1632343

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): Closure of Emergency Pits

GENERAL INFORMATION

OGCC Operator Number: 69175		Contact Name and Telephone	
Name of Operator: Petroleum Development Corporation (PDC)		Name: Adell Heneghan	
Address: 1775 Sherman Street, Suite 3000		No: 970-285-9606	
City: Denver State: CO Zip: 80203		Fax: 970-285-9619	
API/Facility No: 05-045-14738		County: Garfield	
Facility Name: Chevron 22D-17		Facility Number: PIT FACILITY # 432080	
Well Name: Chevron		Well Number: 22D-17	
Location (Qtr, Sec, Twp, Rng, Meridian): SENW, Sec 17, T6S, R96W, 6th P M		Latitude: 39.52442 Longitude: -108.13372	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Flow back fluids

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.): Access road, open agriculture land, undeveloped rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Torriorthents-Camborthids-Rock outcrop complex

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Jangle Ditch is located 450' east of the site Parachute Creek is located approximately 880' east of the site Two residences are located approximately 0.42 miles northeast of the site. A hand dug well is believed to be located at each residence

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

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	See attached figures	Soil samples for field screening and laboratory analysis
<input type="checkbox"/> Vegetation		
<input type="checkbox"/> Groundwater		
<input type="checkbox"/> Surface water		

REMEDIATION WORKPLAN

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

On January 22, 2010 a flow back line parted near the wellhead valve, causing an immediate release of flow back fluid onto the pad site. A diversion ditch was excavated across the pad surface from the release location at the well head and connected to two emergency fluid recovery pits. The first pit was excavated approximately 140 feet (ft) east of the center of the production tank onsite. A second pit was excavated 35 ft west of the first pit to capture additional flow back fluid moving across the pad surface. Both of the pits were unlined and approximately 5 ft wide by 5 ft long by 5 ft below ground surface (bgs). The Colorado Oil and Gas Conservation Commission (COGCC) and surface owner were verbally notified of the release on 1/23/10. A Form 19 was submitted to the COGCC on 1/26/10 (Spill #1632343). A Form 15 and this Form 27 are being submitted to document the closure of emergency pits associated with the release.

Describe how source is to be removed:

Pot holes were excavated in each of the two pits on February 17, 2010 to collect confirmation soil samples. Soil samples were collected from the base of each pit at approximately 5 ft bgs and submitted to a contract laboratory for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), total petroleum hydrocarbons (TPH), electrical conductivity (EC), sodium adsorption ratio (SAR), pH, polycyclic aromatic hydrocarbons (PAHs), and metals. A background soil sample was also collected off the pad surface and submitted for analysis of arsenic. A topographic map of the site area and a site map depicting the soil samples locations are provided as Figures 1 and 2. Soil analytical results are provided in Table 1.

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.:

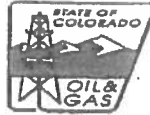
Vacuum trucks were used to recover flow back fluid from the site. The pits were utilized during fluid recovery activities from 10:45 pm on January 22, 2010 to 3:30 am on January 23, 2010, which was when control of the well was re-gained. The emergency fluid recovery pits and berms allowed for the recovery of approximately 1,182 bbls of flow back fluid. All of the fluid recovered at the site was transported to Cisco, Utah for disposal.

Location ID # 324425

PIT Facility ID # 432080  
Location # 324425

FORM  
27  
Rev 6/99  
Page 2

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



Tracking Number: \_\_\_\_\_  
Name of Operator: PDC  
OGCC Operator No: 69175  
Received Date: \_\_\_\_\_  
Well Name & No: Chevron 22D-17 ✓  
Facility Name & No.: Chevron 22D-17

### REMEDIAL WORKPLAN (CONT.)

OGCC Employee: \_\_\_\_\_

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):  
Groundwater was not encountered at the site.

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.

PDC's production facility remains at the site. The two emergency fluid recovery pits were back filled with clean native soil and restored to previous grade. ✓

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:

Laboratory results indicated BTEX, TPH, EC, pH, PAHs, and metals, with the exception of arsenic, in soil samples collected from the base of each pit were below COGCC Table 910-1 Concentrations Levels. The arsenic concentrations for both soil samples (FRE1@5' and FRE2@5') exceeded the Table 910-1 Concentration Level at concentrations of 6.1 mg/kg and 6.4 mg/kg, respectively. However, the background arsenic sample exhibited a concentration of 14.8 mg/kg. Therefore, the arsenic concentrations detected at the base of both emergency pits are within naturally occurring background levels. The SAR concentration for soil sample FRE1@5' exceeded the Table 910-1 Concentration Level. Soil sample FRE1@5' was collected from the base of the western most pit which is currently buried beneath 5 ft of backfill cover. Since the COGCC acknowledges they typically regulate SAR to ensure proper reclamation of disturbed areas, a limited exceedance of this parameter will not affect reclamation due to burial below the vegetative root zone. Based on the analytical results provided, PDC is requesting No Further Action status for the emergency fluid recovery pits excavated at the Chevron 22D-17 site. ✓

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

Vacuum trucks were used to recover flow back fluid from the site. The pits were utilized during fluid recovery activities from 10:45 pm on January 22, 2010 to 3:30 am on January 23, 2010, which was when control of the well was re-gained. The emergency fluid recovery pits and berms allowed for the recovery of approximately 1,182 bbls of flow back fluid. All of the fluid recovered at the site was transported to Cisco, Utah for disposal. ✓

### IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 1/22/10	Date Site Investigation Completed: 2/17/10	Remediation Plan Submitted: 2/25/10
Remediation Start Date: 1/22/10	Anticipated Completion Date: 2/17/10	Actual Completion Date: _____

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

Print Name: Adell Heneghan

Signed: Adell Heneghan Title: EH & S Coordinator Date: 2/25/10

OGCC Approved: Chris Canfield Title: FOR Chris Canfield Date: 03/07/2013  
EPS  
NW Region

**TABLE 1**  
**SOIL ANALYTICAL RESULTS**  
**CHEVRON 22D-17 (1/22/10 RELEASE)**  
**GARFIELD COUNTY, COLORADO**  
**PETROLEUM DEVELOPMENT CORPORATION**

Sample ID	FRE1@5'	FRE2@5'	BG@6"	COGCC Table 910-1
Collection Date	2/17/2010	2/17/2010	2/17/2010	Concentration Levels
TPH GRO (mg/kg)	<5.9	<6.3	NA	500
TPH DRO (mg/kg)	<28.3	<17.2	NA	500
Benzene (mg/kg)	<0.0055	<0.0055	NA	0.17
Toluene (mg/kg)	<0.0055	0.0014	NA	85
Ethylbenzene (mg/kg)	<0.0055	<0.0055	NA	100
Total Xylenes (mg/kg)	<0.016	<0.017	NA	175
Acenaphthene (mg/kg)	<0.0073	<0.0075	NA	1000
Anthracene (mg/kg)	<0.0073	<0.0075	NA	1000
Benzo (a) anthracene (mg/kg)	<0.0073	<0.0075	NA	0.22
Benzo (a) pyrene (mg/kg)	<0.0073	<0.0075	NA	0.022
Benzo (b) fluoranthene (mg/kg)	<0.0073	<0.0075	NA	0.22
Benzo (k) fluoranthene (mg/kg)	<0.0073	<0.0075	NA	2.2
Chrysene (mg/kg)	0.003	<0.0075	NA	22
Dibenzo (a,h) anthracene (mg/kg)	<0.0073	<0.0075	NA	0.022
Fluoranthene (mg/kg)	<0.0073	<0.0075	NA	1000
Fluorene (mg/kg)	<0.0073	<0.0075	NA	1000
Indeno (1,2,3-cd) pyrene (mg/kg)	<0.0073	<0.0075	NA	0.22
Naphthalene (mg/kg)	0.0067	0.006	NA	23
Pyrene (mg/kg)	<0.0073	<0.0075	NA	1000
Arsenic (mg/kg)	<b>6.1</b>	<b>6.4</b>	<b>14.8</b>	0.39
Barium* (mg/kg)	130	167	NA	15,000
Cadmium (mg/kg)	0.65	0.65	NA	70
Chromium (III) (mg/kg)	7.3	9.1	NA	120,000
Chromium (VI) (mg/kg)	<2.0	2.0	NA	23
Copper (mg/kg)	12.8	14.3	NA	3,100
Lead (mg/kg)	7.3	8.5	NA	400
Mercury (mg/kg)	0.039	0.039	NA	23
Nickel (mg/kg)	9.6	11.1	NA	1,600
Selenium (mg/kg)	<0.61	<0.67	NA	390
Silver (mg/kg)	<0.61	<0.67	NA	390
Zinc (mg/kg)	44.5	51.1	NA	23,000
EC (mmhos/cm)	2.28**	1.74**	NA	4.0
pH (SU)	8.44	7.87	NA	6 - 9
SAR (unitless)	<b>15.6</b>	5.65	NA	12

**NOTES:**

NA - not analyzed

mg/kg - milligrams per kilogram

EC- electrical conductivity

mmho/cm - millimhos per cm in saturated paste extract

SU - standard unit on saturated paste

SAR - sodium adsorption ratio

TPH GRO - total petroleum hydrocarbons gasoline range organics

TPH DRO - total petroleum hydrocarbons diesel range organics

Total TPH - sum of TPH GRO and TPH DRO concentrations

< - less than the Reporting Limit (RL)

Analytical results noted in bold exceed COGCC Table 910-1 Concentration Levels

\* Analysis of barium run by total metals method

\*\* Analytical result reported in micromhos per centimeter (µmhos/cm)



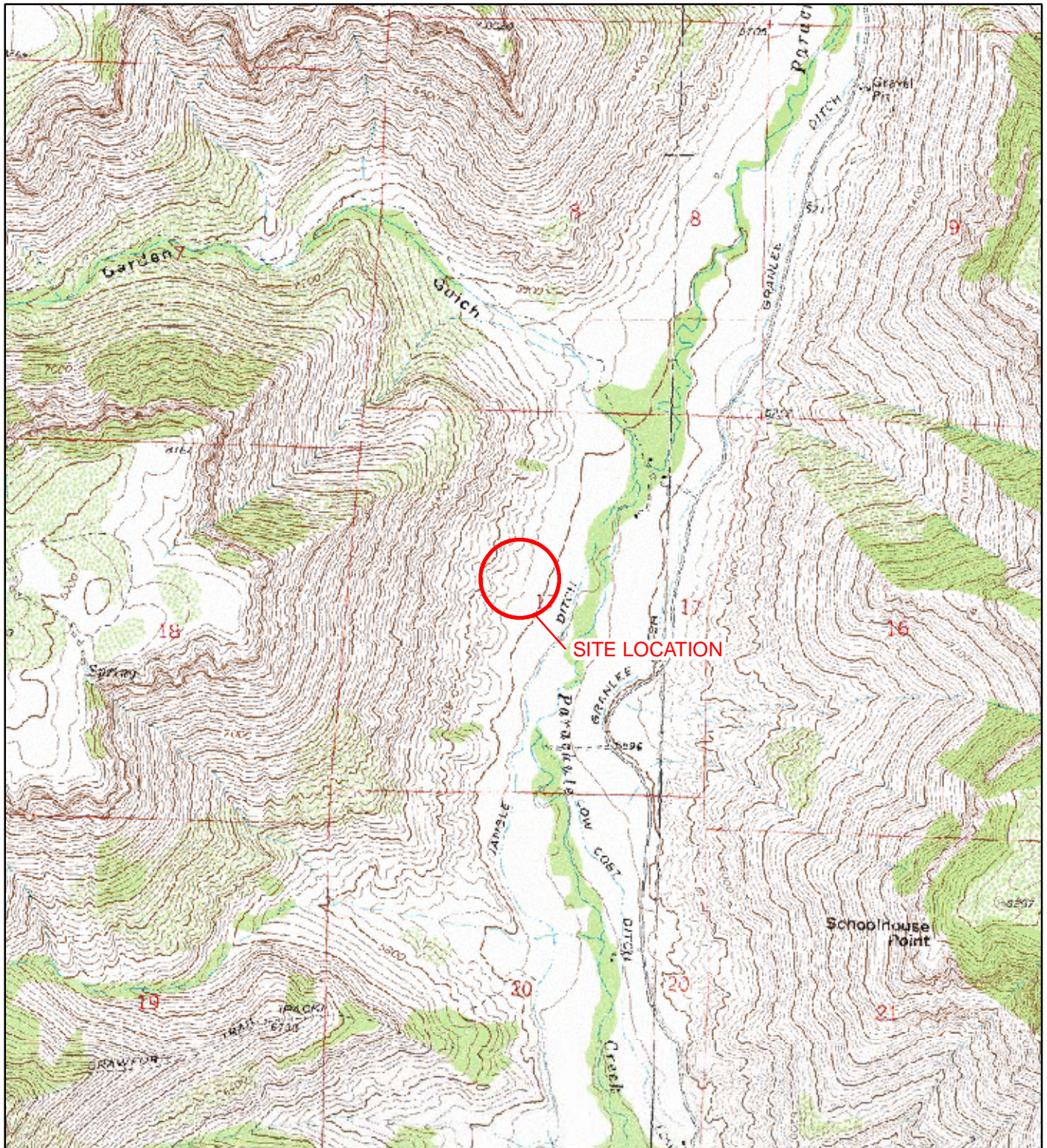
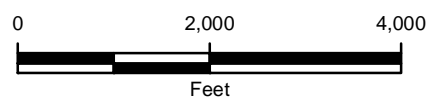


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES



#### LEGEND

 SITE LOCATION

**FIGURE 1**  
**SITE LOCATION MAP**  
**CHEVRON 22D-17 (01/22/10 RELEASE)**  
**SENW SEC 17 T6S R96W**  
**GARFIELD COUNTY, COLORADO**  
**PETROLEUM DEVELOPMENT CORPORATION**







LEGEND

- |                           |                                 |                             |
|---------------------------|---------------------------------|-----------------------------|
| ● WELLHEAD                | □ FRAC TANKS                    | ▨ LINED SOIL CONTAINMENT    |
| ✕ RELEASE LOCATION        | → SURFACE FLOW                  | ■ FLUID RECOVERY EXCAVATION |
| ▲ SOIL SAMPLE             | — SPILL RESPONSE BERM (EARTHEN) |                             |
| ↓ DRAINAGE FLOW DIRECTION | ⋯ DIVERSION DITCH               |                             |
| □ PAD PERIMETER           | - · - IRRIGATION DITCH          |                             |
| ✕ FENCE                   | — ROAD                          |                             |

0 80 160  
Feet



FIGURE 2  
SITE MAP  
CHEVRON 22D-17 (01/22/10 RELEASE)  
SENW SEC 17 T6S R96W  
GARFIELD COUNTY, COLORADO  
PETROLEUM DEVELOPMENT CORPORATION





02/24/10

## Technical Report for

**LT Environmental**

**COGCC Project**

**Chevron 22D-17 (Deep Well) Release**

**Accutest Job Number: T47818**

**Sampling Date: 02/17/10**

**Report to:**

LT Environmental  
820 Megan Ave, Unit B  
Rifle, CO 81650  
sghan@ltenv.com; aweinberg@ltenv.com;  
hbauer@ltenv.com; jjanicek@ltenv.com  
ATTN: Scott Ghan

**Total number of pages in report: 66**



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.

*Paul K Canevaro*

**Paul Canevaro**  
**Laboratory Director**

**Client Service contact: Georgia Jones 713-271-4700**

Certifications: TX (T104704220-06-TX) AR (88-0756) FL (E87628) KS (E-10366) LA (85695/04004)  
OK (9103) UT(7132714700)

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

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Sample Results .....</b>	<b>4</b>
<b>2.1:</b> T47818-1: FRE1@5' .....	5
<b>2.2:</b> T47818-1A: FRE1@5' .....	11
<b>2.3:</b> T47818-2: FRE2@5' .....	13
<b>2.4:</b> T47818-2A: FRE2@5' .....	19
<b>2.5:</b> T47818-3: BG@6" .....	21
<b>Section 3: Misc. Forms .....</b>	<b>22</b>
<b>3.1:</b> Chain of Custody .....	23
<b>Section 4: GC/MS Volatiles - QC Data Summaries .....</b>	<b>26</b>
<b>4.1:</b> Method Blank Summary .....	27
<b>4.2:</b> Blank Spike Summary .....	28
<b>4.3:</b> Matrix Spike/Matrix Spike Duplicate Summary .....	29
<b>Section 5: GC/MS Semi-volatiles - QC Data Summaries .....</b>	<b>30</b>
<b>5.1:</b> Method Blank Summary .....	31
<b>5.2:</b> Blank Spike Summary .....	32
<b>5.3:</b> Matrix Spike/Matrix Spike Duplicate Summary .....	33
<b>Section 6: GC Volatiles - QC Data Summaries .....</b>	<b>34</b>
<b>6.1:</b> Method Blank Summary .....	35
<b>6.2:</b> Blank Spike Summary .....	36
<b>6.3:</b> Matrix Spike/Matrix Spike Duplicate Summary .....	37
<b>Section 7: GC Semi-volatiles - QC Data Summaries .....</b>	<b>38</b>
<b>7.1:</b> Method Blank Summary .....	39
<b>7.2:</b> Blank Spike Summary .....	40
<b>7.3:</b> Matrix Spike/Matrix Spike Duplicate Summary .....	41
<b>Section 8: Metals Analysis - QC Data Summaries .....</b>	<b>42</b>
<b>8.1:</b> Prep QC MP11170: Ba,B,Cd,Cr,Cu,Pb,Ni,Se,Ag,Zn .....	43
<b>8.2:</b> Prep QC MP11178: Ca,Mg,Na,Sodium Adsorption Ratio .....	48
<b>8.3:</b> Prep QC MP11201: Hg .....	50
<b>Section 9: General Chemistry - QC Data Summaries .....</b>	<b>54</b>
<b>9.1:</b> Method Blank and Spike Results Summary .....	55
<b>9.2:</b> Duplicate Results Summary .....	56
<b>9.3:</b> Matrix Spike Results Summary .....	57
<b>Section 10: Misc. Forms (Accutest New Jersey) .....</b>	<b>58</b>
<b>10.1:</b> Chain of Custody .....	59
<b>Section 11: Metals Analysis - QC Data (Accutest New Jersey) .....</b>	<b>61</b>
<b>11.1:</b> Prep QC MP51613: As .....	62



Sample Summary

LT Environmental

Job No: T47818

COGCC Project  
Project No: Chevron 22D-17 (Deep Well) Release

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
T47818-1	02/17/10	10:20	02/18/10	SO	Soil	FRE1@5'
T47818-1A	02/17/10	10:20	02/18/10	SO	Soil	FRE1@5'
T47818-2	02/17/10	10:40	02/18/10	SO	Soil	FRE2@5'
T47818-2A	02/17/10	10:40	02/18/10	SO	Soil	FRE2@5'
T47818-3	02/17/10	10:50	02/18/10	SO	Soil	BG@6"

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





## Sample Results

## Report of Analysis

## Report of Analysis

**Client Sample ID:** FRE1@5'  
**Lab Sample ID:** T47818-1  
**Matrix:** SO - Soil  
**Method:** SW846 8260B  
**Project:** COGCC Project

**Date Sampled:** 02/17/10  
**Date Received:** 02/18/10  
**Percent Solids:** 90.7

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M0024171.D	1	02/19/10	JL	n/a	n/a	VM973
Run #2							

	Initial Weight	Final Volume
Run #1	5.04 g	5.0 ml
Run #2		

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0055	0.00076	mg/kg	
108-88-3	Toluene	ND	0.0055	0.0010	mg/kg	
100-41-4	Ethylbenzene	ND	0.0055	0.00099	mg/kg	
1330-20-7	Xylene (total)	ND	0.016	0.0023	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	124% <sup>a</sup>		70-121%
2037-26-5	Toluene-D8	111%		76-132%
460-00-4	4-Bromofluorobenzene	111%		73-165%
17060-07-0	1,2-Dichloroethane-D4	115%		57-122%

(a) Outside of control limits biased high. Only ND results were reported for this sample.

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

<b>Client Sample ID:</b>	FRE1@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-1	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	90.7
<b>Method:</b>	SW846 8270C BY SIM SW846 3550B		
<b>Project:</b>	COGCC Project		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	H37079.D	1	02/19/10	SC	02/19/10	OP14113	EH1989
Run #2 <sup>a</sup>	H37083.D	10	02/19/10	SC	02/19/10	OP14113	EH1989

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2	30.4 g	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0073	0.0012	mg/kg	
120-12-7	Anthracene	ND	0.0073	0.0014	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0073	0.0012	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0073	0.0039	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0073	0.0038	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0073	0.0047	mg/kg	
218-01-9	Chrysene	0.0030	0.0073	0.0018	mg/kg	J
53-70-3	Dibenzo(a,h)anthracene	ND	0.0073	0.0070	mg/kg	
206-44-0	Fluoranthene	ND	0.0073	0.0016	mg/kg	
86-73-7	Fluorene	ND	0.0073	0.0026	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0073	0.0054	mg/kg	
91-20-3	Naphthalene	0.0067	0.0073	0.0011	mg/kg	J
129-00-0	Pyrene	ND	0.0073	0.0025	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	26%	25%	10-127%
321-60-8	2-Fluorobiphenyl	27%	63%	11-133%
1718-51-0	Terphenyl-d14	80%	65%	15-187%

(a) Internal standards are not within the advisory limits due to a matrix interference. Confirmed by reanalysis.

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

Page 1 of 1

<b>Client Sample ID:</b>	FRE1@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-1	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	90.7
<b>Method:</b>	SW846 8015		
<b>Project:</b>	COGCC Project		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE052124.D	1	02/19/10	FI	n/a	n/a	GEE2638
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.09 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.9	0.36	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	99%		46-127%
98-08-8	aaa-Trifluorotoluene	105%		44-120%

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

<b>Client Sample ID:</b>	FRE1@5'						
<b>Lab Sample ID:</b>	T47818-1			<b>Date Sampled:</b>	02/17/10		
<b>Matrix:</b>	SO - Soil			<b>Date Received:</b>	02/18/10		
<b>Method:</b>	SW846 8015 M SW846 3550B			<b>Percent Solids:</b>	90.7		
<b>Project:</b>	COGCC Project						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	CC218083.D	1	02/22/10	EM	02/19/10	OP14112	GCC1061
Run #2							

	Initial Weight	Final Volume
Run #1	30.8 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	28.3	9.0	2.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	92%		33-115%		

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

MDL - Method Detection 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: FRE1@5'

Lab Sample ID: T47818-1

Matrix: SO - Soil

Date Sampled: 02/17/10

Date Received: 02/18/10

Percent Solids: 90.7

Project: COGCC Project

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Arsenic <sup>a</sup>	6.1	0.30	mg/kg	10	02/23/10	02/23/10 ANJ	SW846 6020 <sup>3</sup>	SW846 3050B <sup>6</sup>
Barium	130	12	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Boron	6.8	6.1	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.65	0.30	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Chromium	9.1	0.61	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Copper	12.8	1.5	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Lead	7.3	0.61	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Mercury	0.039	0.018	mg/kg	1	02/24/10	02/24/10 TW	SW846 7471A <sup>2</sup>	SW846 7471A <sup>5</sup>
Nickel	9.6	2.4	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Selenium	< 0.61	0.61	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Silver	< 0.61	0.61	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Zinc	44.5	1.2	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA4549

(2) Instrument QC Batch: MA4555

(3) Instrument QC Batch: N:MA23897

(4) Prep QC Batch: MP11170

(5) Prep QC Batch: MP11201

(6) Prep QC Batch: N:MP51613

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

RL = Reporting Limit



# Report of Analysis

<b>Client Sample ID:</b>	FRE1@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-1	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	90.7
<b>Project:</b>	COGCC Project		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	< 2.0	2.0	mg/kg	1	02/22/10 10:00	KD	SW846 3060/7196A
Chromium, Trivalent <sup>a</sup>	7.3	2.6	mg/kg	1	02/22/10 17:35	NS	SW846 6010/7196A M
Solids, Percent	90.7		%	1	02/19/10	MR	SM 2540 G
Specific Conductivity	2280	1.0	umhos/cm	1	02/22/10 13:00	KD	EPA 120.1
pH	8.44		su	1	02/24/10 14:30	KD	SW846 9045C

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

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	FRE1@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-1A	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	90.7
<b>Project:</b>	COGCC Project		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	425	25	mg/l	5	02/22/10	02/23/10 NS	SW846 6010B <sup>1</sup>	LADNR 29B <sup>3</sup>
Magnesium	241	25	mg/l	5	02/22/10	02/23/10 NS	SW846 6010B <sup>1</sup>	LADNR 29B <sup>3</sup>
Sodium	1620	50	mg/l	10	02/22/10	02/24/10 NS	SW846 6010B <sup>2</sup>	LADNR 29B <sup>3</sup>

- (1) Instrument QC Batch: MA4554
- (2) Instrument QC Batch: MA4557
- (3) Prep QC Batch: MP11178

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	FRE1@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-1A	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	90.7
<b>Project:</b>	COGCC Project		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	15.6		ratio	1	02/24/10 13:23	NS	LADNR29B

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

RL = Reporting Limit



## Report of Analysis

**Client Sample ID:** FRE2@5'  
**Lab Sample ID:** T47818-2  
**Matrix:** SO - Soil  
**Method:** SW846 8260B  
**Project:** COGCC Project

**Date Sampled:** 02/17/10  
**Date Received:** 02/18/10  
**Percent Solids:** 87.7

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M0024172.D	1	02/19/10	JL	n/a	n/a	VM973
Run #2							

	Initial Weight	Final Volume
Run #1	5.18 g	5.0 ml
Run #2		

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0055	0.00077	mg/kg	
108-88-3	Toluene	0.0014	0.0055	0.0010	mg/kg	J
100-41-4	Ethylbenzene	ND	0.0055	0.00099	mg/kg	
1330-20-7	Xylene (total)	ND	0.017	0.0023	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	122% <sup>a</sup>		70-121%
2037-26-5	Toluene-D8	112%		76-132%
460-00-4	4-Bromofluorobenzene	113%		73-165%
17060-07-0	1,2-Dichloroethane-D4	111%		57-122%

(a) Outside control limits biased high. There are no target compounds associated with this surrogate.

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

<b>Client Sample ID:</b>	FRE2@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-2	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	87.7
<b>Method:</b>	SW846 8270C BY SIM SW846 3550B		
<b>Project:</b>	COGCC Project		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	H37080.D	1	02/19/10	SC	02/19/10	OP14113	EH1989
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0075	0.0013	mg/kg	
120-12-7	Anthracene	ND	0.0075	0.0014	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0075	0.0012	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0075	0.0040	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0075	0.0040	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0075	0.0049	mg/kg	
218-01-9	Chrysene	ND	0.0075	0.0019	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.0075	0.0073	mg/kg	
206-44-0	Fluoranthene	ND	0.0075	0.0016	mg/kg	
86-73-7	Fluorene	ND	0.0075	0.0027	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0075	0.0056	mg/kg	
91-20-3	Naphthalene	0.0060	0.0075	0.0012	mg/kg	J
129-00-0	Pyrene	ND	0.0075	0.0026	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	33%		10-127%
321-60-8	2-Fluorobiphenyl	33%		11-133%
1718-51-0	Terphenyl-d14	77%		15-187%

(a) Internal standards are not within the advisory limits due to a matrix interference. Confirmed by associated ms/msd.

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

<b>Client Sample ID:</b>	FRE2@5'						
<b>Lab Sample ID:</b>	T47818-2				<b>Date Sampled:</b>	02/17/10	
<b>Matrix:</b>	SO - Soil				<b>Date Received:</b>	02/18/10	
<b>Method:</b>	SW846 8015				<b>Percent Solids:</b>	87.7	
<b>Project:</b>	COGCC Project						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE052125.D	1	02/19/10	FI	n/a	n/a	GEE2638
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.09 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	6.3	0.38	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	99%		46-127%
98-08-8	aaa-Trifluorotoluene	105%		44-120%

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

<b>Client Sample ID:</b>	FRE2@5'						
<b>Lab Sample ID:</b>	T47818-2				<b>Date Sampled:</b>	02/17/10	
<b>Matrix:</b>	SO - Soil				<b>Date Received:</b>	02/18/10	
<b>Method:</b>	SW846 8015 M SW846 3550B				<b>Percent Solids:</b>	87.7	
<b>Project:</b>	COGCC Project						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	CC218085.D	1	02/22/10	EM	02/19/10	OP14112	GCC1061
Run #2							

	Initial Weight	Final Volume
Run #1	30.7 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	17.2	9.3	3.1	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	95%		33-115%		

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

MDL - Method Detection 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:** FRE2@5'  
**Lab Sample ID:** T47818-2  
**Matrix:** SO - Soil  
**Project:** COGCC Project

**Date Sampled:** 02/17/10  
**Date Received:** 02/18/10  
**Percent Solids:** 87.7

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analized By	Method	Prep Method
Arsenic <sup>a</sup>	6.4	1.2	mg/kg	40	02/23/10	02/23/10 ANJ	SW846 6020 <sup>3</sup>	SW846 3050B <sup>6</sup>
Barium	167	13	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Boron	9.5	6.7	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Cadmium	0.63	0.34	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Chromium	11.1	0.67	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Copper	14.3	1.7	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Lead	8.5	0.67	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Mercury	0.039	0.018	mg/kg	1	02/24/10	02/24/10 TW	SW846 7471A <sup>2</sup>	SW846 7471A <sup>5</sup>
Nickel	11.1	2.7	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Selenium	< 0.67	0.67	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Silver	< 0.67	0.67	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>
Zinc	51.1	1.3	mg/kg	1	02/19/10	02/22/10 NS	SW846 6010B <sup>1</sup>	SW846 3050B <sup>4</sup>

- (1) Instrument QC Batch: MA4549  
 (2) Instrument QC Batch: MA4555  
 (3) Instrument QC Batch: N:MA23897  
 (4) Prep QC Batch: MP11170  
 (5) Prep QC Batch: MP11201  
 (6) Prep QC Batch: N:MP51613

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	FRE2@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-2	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	87.7
<b>Project:</b>	COGCC Project		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.0	2.0	mg/kg	1	02/22/10 10:00	KD	SW846 3060/7196A
Chromium, Trivalent <sup>a</sup>	9.1	2.7	mg/kg	1	02/22/10 17:41	NS	SW846 6010/7196A M
Solids, Percent	87.7		%	1	02/19/10	MR	SM 2540 G
Specific Conductivity	1740	1.0	umhos/cm	1	02/22/10 13:00	KD	EPA 120.1
pH	7.87		su	1	02/24/10 14:30	KD	SW846 9045C

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

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	FRE2@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-2A	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	87.7
<b>Project:</b>	COGCC Project		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	697	25	mg/l	5	02/22/10	02/23/10 NS	SW846 6010B <sup>1</sup>	LADNR 29B <sup>2</sup>
Magnesium	290	25	mg/l	5	02/22/10	02/23/10 NS	SW846 6010B <sup>1</sup>	LADNR 29B <sup>2</sup>
Sodium	704	25	mg/l	5	02/22/10	02/23/10 NS	SW846 6010B <sup>1</sup>	LADNR 29B <sup>2</sup>

(1) Instrument QC Batch: MA4554  
(2) Prep QC Batch: MP11178

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	FRE2@5'	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-2A	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	87.7
<b>Project:</b>	COGCC Project		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	5.65		ratio	1	02/23/10 23:26	NS	LADNR29B

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

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	BG@6"	<b>Date Sampled:</b>	02/17/10
<b>Lab Sample ID:</b>	T47818-3	<b>Date Received:</b>	02/18/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.5
<b>Project:</b>	COGCC Project		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic <sup>a</sup>	14.8	1.2	mg/kg	40	02/23/10	02/23/10 ANJ	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: N:MA23897  
(2) Prep QC Batch: N:MP51613  
  
(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

RL = Reporting Limit



## Misc. Forms

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody



## CHAIN OF CUSTODY

10165 Harwin, Suite 150  
Houston, TX 77036  
713-271-4700 fax: 713-271-4770

Accutest Job #:
Accutest Control #:

T47818

Client Information				Facility Information										Analytical Information											
Name LT Environmental				Project Name Chevron 22D-17 (Deep Well) Release										Total Metals 6010 per COGCC Table 910-1	Total Arsenic 6020	Conductivity	pH	TPH-GRO/DRO Only	BTEX	SAR	PAHs per COGCC Table 910-1	Arsenic only			
Address 820 Megan Ave, Unit B				Location Garfield County																					
City Rifle				Project No. PDCW1004																					
State CO				Zip 81650																					
Report to: Phone #: 970-285-9985				Email: aweinberg@ltenv.com																					
Collection				Preservation																					
Field ID / Point of Collection	Date	Time	Sampled By	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	None															
FRE105'	2/17/10	1020	SS	Soil	4+						X	X	X	X	X	X	X	X	X						
FRE205'	2/17/10	1040	SS	Soil	4+						X	X	X	X	X	X	X	X	X						
BG06"	2/17/10	1050	SS	Soil	1						X									X					
Turnaround Information				Data Deliverable Information										Comments /Remarks											
<input type="checkbox"/> 21 Day Standard <input type="checkbox"/> 14 Day <input type="checkbox"/> 7 Days EMERGENCY <input checked="" type="checkbox"/> Other 7 (Days) RUSH TAT is for FAX data unless previously approved.				Approved By: Per Bruce Schlatter				<input type="checkbox"/> NJ Reduced <input type="checkbox"/> NJ Full <input type="checkbox"/> FULL CLP <input type="checkbox"/> Disk Deliverable <input checked="" type="checkbox"/> Other (Specify)				<input type="checkbox"/> Commercial "A" <input checked="" type="checkbox"/> Commercial "B" <input type="checkbox"/> ASP Category B <input type="checkbox"/> State Forms				Metals: Cadmium, Chromium (III), Chromium (VI), Copper, Lead, Mercury, Nickel, Selenium, Silver, Zinc, Barium.									
Sample Custody must be documented below each time samples change possession, including courier delivery.																									
Relinquished by Sampler:				Date Time:				Received By:				Relinquished By:				Date Time:				Received By:					
1 Steve Singler				2/17/10-1600				1				2 Fed Ex				2/18/10 0915				2					
Relinquished by Sampler:				Date Time:				Received By:				Relinquished By:				Date Time:				Received By:					
3								3				4				4									
Relinquished by Sampler:				Date Time:				Received By:				Seal #				Preserved where applicable				On Ice:					
5								5								<input type="checkbox"/>				<input checked="" type="checkbox"/> 2.0					

T47818: Chain of Custody

Page 1 of 3

# SAMPLE INSPECTION FORM

Accutest Job Number: T47818 Client: LT Environmental Date/Time Received: 02/18/10 0915  
 # of Coolers Received: 1 Thermometer #: 12-1 Temperature Adjustment Factor: +0.4  
 Cooler Temps: #1: 2.0 #2: \_\_\_\_\_ #3: \_\_\_\_\_ #4: \_\_\_\_\_ #5: \_\_\_\_\_ #6: \_\_\_\_\_ #7: \_\_\_\_\_ #8: \_\_\_\_\_  
 Method of Delivery: ☒ ~~FEDEX~~ ☐ UPS ☐ Accutest Courier ☐ Greyhound ☐ Delivery ☐ Other

Airbill Numbers: \_\_\_\_\_

## COOLER INFORMATION

- ☐ Custody seal missing or not intact
- ☐ Temperature criteria not met
- ☐ Wet ice received in cooler

## CHAIN OF CUSTODY

- ☐ Chain of Custody not received
- ☐ Sample D/T unclear or missing
- ☐ Analyses unclear or missing
- ☐ COC not properly executed

## SAMPLE INFORMATION

- ☐ Sample containers received broken
- ☐ VOC vials have headspace
- ☐ Sample labels missing or illegible
- ☐ ID on COC does not match label(s)
- ☐ D/T on COC does not match label(s)
- ☐ Sample/Bottles rec'd but no analysis on COC
- ☐ Sample listed on COC, but not received
- ☐ Bottles missing for requested analysis
- ☐ Insufficient volume for analysis
- ☐ Sample received (improperly preserved)

## TRIP BLANK INFORMATION

- ☐ Trip Blank on COC but not received
- ☐ Trip Blank received but not on COC
- ☐ Trip Blank not intact
- ☐ Received Water Trip Blank
- ☐ Received Soil TB

Number of Encores? \_\_\_\_\_  
 Number of 5035 kits? \_\_\_\_\_  
 Number of lab-filtered metals? \_\_\_\_\_

Summary of Discrepancies:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

TECHNICIAN SIGNATURE/DATE: [Signature] 02/18/10

INFORMATION AND SAMPLE LABELING VERIFIED BY: EC 2-13-10

## CORRECTIVE ACTIONS

Client Representative Notified: \_\_\_\_\_ Date: \_\_\_\_\_

By Accutest Representative: \_\_\_\_\_ Via: ☐ Phone ☐ Email

Client Instructions: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

k:\walker\form\samplemanagement

T47818: Chain of Custody

Page 2 of 3







## GC/MS Volatiles

### QC Data Summaries

---

Includes the following where applicable:

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

Method Blank Summary

Job Number: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM973-MB	M0024168.D	1	02/19/10	JL	n/a	n/a	VM973

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

T47818-1, T47818-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	0.70	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	0.90	ug/kg	
108-88-3	Toluene	ND	5.0	0.95	ug/kg	
1330-20-7	Xylene (total)	ND	15	2.1	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	114% 70-121%
2037-26-5	Toluene-D8	105% 76-132%
460-00-4	4-Bromofluorobenzene	95% 73-165%
17060-07-0	1,2-Dichloroethane-D4	104% 57-122%

Blank Spike Summary

Job Number: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM973-BS	M0024164.D	1	02/19/10	JL	n/a	n/a	VM973

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

T47818-1, T47818-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	53.1	106	70-114
100-41-4	Ethylbenzene	50	45.8	92	60-119
108-88-3	Toluene	50	48.7	97	68-115
1330-20-7	Xylene (total)	150	140	93	61-115

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	115%	70-121%
2037-26-5	Toluene-D8	102%	76-132%
460-00-4	4-Bromofluorobenzene	108%	73-165%
17060-07-0	1,2-Dichloroethane-D4	105%	57-122%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T47818-2MS	M0024173.D	1	02/19/10	JL	n/a	n/a	VM973
T47818-2MSD	M0024174.D	1	02/19/10	JL	n/a	n/a	VM973
T47818-2	M0024172.D	1	02/19/10	JL	n/a	n/a	VM973

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

T47818-1, T47818-2

CAS No.	Compound	T47818-2 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		56.8	61.0	107	55.5	103	9	70-114/38
100-41-4	Ethylbenzene	ND		56.8	52.8	93	47.9	89	10	60-119/40
108-88-3	Toluene	1.4	J	56.8	60.8	105	55.3	100	9	68-115/38
1330-20-7	Xylene (total)	ND		170	159	93	145	90	9	61-115/39

CAS No.	Surrogate Recoveries	MS	MSD	T47818-2	Limits
1868-53-7	Dibromofluoromethane	109%	106%	122% * a	70-121%
2037-26-5	Toluene-D8	106%	107%	112%	76-132%
460-00-4	4-Bromofluorobenzene	128%	127%	113%	73-165%
17060-07-0	1,2-Dichloroethane-D4	104%	99%	111%	57-122%

(a) Outside control limits biased high. There are no target compounds associated with this surrogate.



## GC/MS 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

Page 1 of 1

**Job Number:** T47818  
**Account:** LTENCOR LT Environmental  
**Project:** COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14113-MB	H37077.D	1	02/19/10	SC	02/19/10	OP14113	EH1989

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

T47818-1, T47818-2

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	6.7	1.1	ug/kg	
120-12-7	Anthracene	ND	6.7	1.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.7	1.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.7	3.6	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.7	3.5	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.7	4.3	ug/kg	
218-01-9	Chrysene	ND	6.7	1.6	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	6.7	6.4	ug/kg	
206-44-0	Fluoranthene	ND	6.7	1.5	ug/kg	
86-73-7	Fluorene	ND	6.7	2.4	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	5.0	ug/kg	
91-20-3	Naphthalene	ND	6.7	1.0	ug/kg	
129-00-0	Pyrene	ND	6.7	2.3	ug/kg	

CAS No.	Surrogate Recoveries	Limits
4165-60-0	Nitrobenzene-d5	34% 10-127%
321-60-8	2-Fluorobiphenyl	35% 11-133%
1718-51-0	Terphenyl-d14	52% 15-187%

## Blank Spike Summary

Page 1 of 1

**Job Number:** T47818  
**Account:** LTENCOR LT Environmental  
**Project:** COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14113-BS	H37078.D	1	02/19/10	SC	02/19/10	OP14113	EH1989

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

T47818-1, T47818-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	167	162	97	18-118
120-12-7	Anthracene	167	133	80	24-116
56-55-3	Benzo(a)anthracene	167	148	89	32-132
50-32-8	Benzo(a)pyrene	167	126	76	36-130
205-99-2	Benzo(b)fluoranthene	167	187	112	35-134
207-08-9	Benzo(k)fluoranthene	167	168	101	30-131
218-01-9	Chrysene	167	153	92	37-124
53-70-3	Dibenzo(a,h)anthracene	167	119	71	23-150
206-44-0	Fluoranthene	167	187	112	28-118
86-73-7	Fluorene	167	177	106	32-106
193-39-5	Indeno(1,2,3-cd)pyrene	167	123	74	18-150
91-20-3	Naphthalene	167	119	71	31-106
129-00-0	Pyrene	167	135	81	24-132

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	50%	10-127%
321-60-8	2-Fluorobiphenyl	33%	11-133%
1718-51-0	Terphenyl-d14	61%	15-187%

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** T47818  
**Account:** LTENCOR LT Environmental  
**Project:** COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14113-MS	H37081.D	1	02/19/10	SC	02/19/10	OP14113	EH1989
OP14113-MSD	H37082.D	1	02/19/10	SC	02/19/10	OP14113	EH1989
T47818-2 <sup>a</sup>	H37080.D	1	02/19/10	SC	02/19/10	OP14113	EH1989

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

T47818-1, T47818-2

CAS No.	Compound	T47818-2 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		190	165	87	184	97	11	10-153/80
120-12-7	Anthracene	ND		190	129	68	146	77	12	10-176/57
56-55-3	Benzo(a)anthracene	ND		190	157	83	166	88	6	10-174/73
50-32-8	Benzo(a)pyrene	ND		190	136	72	139	74	2	10-182/74
205-99-2	Benzo(b)fluoranthene	ND		190	182	96	179	95	2	10-188/86
207-08-9	Benzo(k)fluoranthene	ND		190	158	83	161	85	2	10-170/94
218-01-9	Chrysene	ND		190	157	83	165	87	5	10-165/73
53-70-3	Dibenzo(a,h)anthracene	ND		190	176	93	209	111	17	10-192/74
206-44-0	Fluoranthene	ND		190	178	94	188	100	5	10-141/73
86-73-7	Fluorene	ND		190	192	101	217	115	12	10-164/72
193-39-5	Indeno(1,2,3-cd)pyrene	ND		190	173	91	202	107	15	10-150/73
91-20-3	Naphthalene	6.0	J	190	120	60	125	63	4	10-138/82
129-00-0	Pyrene	ND		190	211	111	215	114	2	10-150/66

CAS No.	Surrogate Recoveries	MS	MSD	T47818-2	Limits
4165-60-0	Nitrobenzene-d5	43%	44%	33%	10-127%
321-60-8	2-Fluorobiphenyl	32%	34%	33%	11-133%
1718-51-0	Terphenyl-d14	82%	82%	77%	15-187%

(a) Internal standards are not within the advisory limits due to a matrix interference. Confirmed by associated ms/msd.



## GC Volatiles

### QC Data Summaries

---

Includes the following where applicable:

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

## Method Blank Summary

Page 1 of 1

**Job Number:** T47818  
**Account:** LTENCOR LT Environmental  
**Project:** COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEE2638-MB	EE052109.D	1	02/19/10	FI	n/a	n/a	GEE2638

The QC reported here applies to the following samples:

Method: SW846 8015

T47818-1, T47818-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.0	0.30	mg/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	4-Bromofluorobenzene	98%
98-08-8	aaa-Trifluorotoluene	102%

Blank Spike Summary

Job Number: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEE2638-BS	EE052106.D	1	02/19/10	FI	n/a	n/a	GEE2638

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

T47818-1, T47818-2

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	0.4	0.358	90	78-115

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	99%	46-127%
98-08-8	aaa-Trifluorotoluene	99%	44-120%



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T47470-15MS	EE052116.D	1	02/19/10	FI	n/a	n/a	GEE2638
T47470-15MSD	EE052117.D	1	02/19/10	FI	n/a	n/a	GEE2638
T47470-15	EE052110.D	1	02/19/10	FI	n/a	n/a	GEE2638

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

T47818-1, T47818-2

CAS No.	Compound	T47470-15 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	21	20.4	97	19.6	93	4	78-115/14

CAS No.	Surrogate Recoveries	MS	MSD	T47470-15	Limits
460-00-4	4-Bromofluorobenzene	105%	99%	98%	46-127%
98-08-8	aaa-Trifluorotoluene	100%	109%	102%	44-120%



## 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: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14112-MB	CC218078.D	1	02/22/10	EM	02/19/10	OP14112	GCC1061

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

T47818-1, T47818-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	8.3	2.7	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	84% 33-115%

Blank Spike Summary

Job Number: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14112-BS	CC218069.D	1	02/22/10	EM	02/19/10	OP14112	GCC1061

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

T47818-1, T47818-2

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH (C10-C28)	33.3	27.7	83	45-107

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	97%	33-115%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T47818  
Account: LTENCOR LT Environmental  
Project: COGCC Project

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14112-MS	CC218070.D	1	02/22/10	EM	02/19/10	OP14112	GCC1061
OP14112-MSD	CC218071.D	1	02/22/10	EM	02/19/10	OP14112	GCC1061
T47756-1	IF195127.D	1	02/22/10	EM	02/19/10	OP14112	GIF957

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

T47818-1, T47818-2

CAS No.	Compound	T47756-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	7.50	J	40.4	36.1	71	36.4	70	1	45-107/34

CAS No.	Surrogate Recoveries	MS	MSD	T47756-1	Limits
84-15-1	o-Terphenyl	106%	101%	58%	33-115%



## 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: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

QC Batch ID: MP11170  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 02/19/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.82	2.2		
Antimony	0.50	.11	.14		
Arsenic	0.50	.089	.1		
Barium	10	.007	.03	0.030	<10
Beryllium	0.25	.0055	.01		
Boron	5.0	.054	.11	-0.022	<5.0
Cadmium	0.25	.013	.05	0.0060	<0.25
Calcium	250	.27	.86		
Chromium	0.50	.055	.035	-0.16	<0.50
Cobalt	2.5	.025	.09		
Copper	1.3	.029	.065	-0.062	<1.3
Iron	5.0	.65	1.1		
Lead	0.50	.079	.2	0.070	<0.50
Magnesium	250	.34	.58		
Manganese	0.75	.01	.035		
Molybdenum	0.50	.048	.075		
Nickel	2.0	.048	.065	-0.37	<2.0
Potassium	250	2.7	16		
Selenium	0.50	.16	.12	-0.031	<0.50
Silver	0.50	.043	.04	-0.0030	<0.50
Sodium	250	6.5	13		
Strontium	1.0	.0085	.025		
Thallium	0.50	.16	.25		
Tin	1.0	.09	.12		
Titanium	1.0	.015	.045		
Vanadium	2.5	.03	.06		
Zinc	1.0	.025	.2	0.0015	<1.0

Associated samples MP11170: T47818-1, T47818-2

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: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

QC Batch ID: MP11170  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

02/19/10

02/19/10

	T47334-1			QC	T47334-1		Spikelot		QC
Metal	Original	DUP	RPD	Limits	Original	MS	MPTW4	% Rec	Limits
Aluminum									
Antimony									
Arsenic	anr								
Barium	79.8	76.3	4.5	0-20	79.8	83.7	28.6	13.6N	80-120
Beryllium									
Boron	0.45	0.26	53.5 (a)	0-20	0.45	41.8	57.2	72.2N	80-120
Cadmium	0.64	0.52	20.7 (a)	0-20	0.64	17.6	28.6	59.3N	80-120
Calcium									
Chromium	4.6	4.7	2.2	0-20	4.6	19.0	28.6	50.3N	80-120
Cobalt									
Copper	21.9	21.2	3.2	0-20	21.9	35.0	28.6	45.8N	80-120
Iron									
Lead	27.0	24.8	8.5	0-20	27.0	40.7	28.6	47.9N	80-120
Magnesium									
Manganese									
Molybdenum	anr								
Nickel	2.6	2.7	3.8	0-20	2.6	16.9	28.6	50.0N	80-120
Potassium	anr								
Selenium	0.0	0.0	NC	0-20	0.0	17.3	28.6	60.5N	80-120
Silver	0.0	0.0	NC	0-20	0.0	21.4	28.6	74.8N	80-120
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc	47.9	58.5	19.9	0-20	47.9	59.7	28.6	41.2N	80-120

Associated samples MP11170: T47818-1, T47818-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) RPD acceptable due to low duplicate and sample concentrations.



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

QC Batch ID: MP11170  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 02/19/10

Metal	T47334-1 Original	MSD	Spikelot MPTW4	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	79.8	98.6	30.2	62.2N	16.3	20
Beryllium						
Boron	0.45	52.6	60.5	86.2	22.9 (a)	20
Cadmium	0.64	22.3	30.2	71.6N	23.6 (a)	20
Calcium						
Chromium	4.6	24.7	30.2	66.5N	26.1 (a)	20
Cobalt						
Copper	21.9	44.1	30.2	73.4N	23.0 (a)	20
Iron						
Lead	27.0	48.1	30.2	69.8N	16.7	20
Magnesium						
Manganese						
Molybdenum	anr					
Nickel	2.6	22.2	30.2	64.8N	27.1 (a)	20
Potassium	anr					
Selenium	0.0	21.6	30.2	71.4N	22.1 (a)	20
Silver	0.0	25.1	30.2	83.0	15.9	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Vanadium						
Zinc	47.9	71.3	30.2	77.4N	17.7	20

Associated samples MP11170: T47818-1, T47818-2

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested  
(a) High RPD due to possible matrix interference.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T47818  
 Account: LTENCOR - LT Environmental  
 Project: COGCC Project

QC Batch ID: MP11170  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: mg/kg

Prep Date: 02/19/10

Metal	LCS Result	Spikelot MPLCD054	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	346	348	99.4	81-119
Beryllium				
Boron	109	136	80.1	73-126
Cadmium	159	187	85.0	82-118
Calcium				
Chromium	75.8	89.5	84.7	79-121
Cobalt				
Copper	129	129	100.0	84-117
Iron				
Lead	147	172	85.5	79-120
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	83.6	99	84.4	81-119
Potassium	anr			
Selenium	132	148	89.2	78-121
Silver	61.0	66	92.4	66-134
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	336	394	85.3	80-119

Associated samples MP11170: T47818-1, T47818-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

8.1.3  
8

# SERIAL DILUTION RESULTS SUMMARY

Login Number: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

QC Batch ID: MP11170  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: ug/l

Prep Date: 02/19/10

Metal	T47334-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	1210	1580	31.2*(a)	0-10
Beryllium				
Boron	6.77	0.00	100.0(b)	0-10
Cadmium	9.64	12.3	27.4 (b)	0-10
Calcium				
Chromium	69.0	73.5	6.5	0-10
Cobalt				
Copper	331	400	20.6*(a)	0-10
Iron				
Lead	409	528	29.3*(a)	0-10
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	38.9	19.0	51.1 (b)	0-10
Potassium	anr			
Selenium	0.00	0.00	NC	0-10
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	724	968	33.6*(a)	0-10

Associated samples MP11170: T47818-1, T47818-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(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: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

QC Batch ID: MP11178  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date: 02/22/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	17		
Antimony	5.0	2.3	3		
Arsenic	5.0	1.8	2		
Barium	200	.14	2.7		
Beryllium	5.0	.11	.2		
Boron	100	1.1	2.1		
Cadmium	4.0	.25	.3		
Calcium	5000	5.4	35	95.6	<5000
Chromium	10	1.1	1.9		
Cobalt	50	.5	.8		
Copper	25	.58	5.9		
Iron	100	13	13		
Lead	3.0	1.6	1.7		
Magnesium	5000	6.7	7.8	24.3	<5000
Manganese	15	.2	7.6		
Molybdenum	10	.96	1.3		
Nickel	40	.95	3.2		
Potassium	5000	53	53		
Selenium	5.0	3.2	3.2		
Silver	10	.85	.8		
Sodium	5000	130	130	81.7	<5000
Strontium	20	.17	.4		
Thallium	10	3.2	2.6		
Tin	20	1.8	2.9		
Titanium	20	.3	.3		
Vanadium	50	.6	.6		
Zinc	20	.49	4.1		

Associated samples MP11178: T47818-1A, T47818-2A

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: T47818  
 Account: LTENCOR - LT Environmental  
 Project: COGCC Project

QC Batch ID: MP11178  
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
 Units: ug/l

Prep Date: 02/22/10

Metal	T47818-1A Original DUP		RPD	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	425000	419000	1.4	0-20
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium	241000	231000	4.2	0-20
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium	1630000	1560000	3.8	0-20
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc				

Associated samples MP11178: T47818-1A, T47818-2A

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

8.2.2  
8

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

QC Batch ID: MP11201  
Matrix Type: SOLID

Methods: SW846 7471A  
Units: mg/kg

Prep Date: 02/24/10

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.017	.0041	.00066	-0.0041	<0.017

Associated samples MP11201: T47818-1, T47818-2

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

8.3.1

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T47818  
 Account: LTENCOR - LT Environmental  
 Project: COGCC Project

QC Batch ID: MP11201  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 02/24/10 02/24/10

Metal	T47594-1		QC	T47594-1		Spikelot	QC	
	Original	DUP	RPD	Limits	Original MS	HGTXWS1	% Rec	Limits
Mercury	0.26	0.32	20.7 (a)	0-20	0.26 2.4	1.97	108.6	75-125

Associated samples MP11201: T47818-1, T47818-2

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) RPD acceptable due to low duplicate and sample concentrations.

8.3.2

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T47818  
 Account: LTENCOR - LT Environmental  
 Project: COGCC Project

QC Batch ID: MP11201  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 02/24/10

Metal	T47594-1		SpikeLot		MSD	QC
	Original	MSD	HGTXWS1	% Rec		
Mercury	0.26	2.4	1.93	110.7	0.0	

Associated samples MP11201: T47818-1, T47818-2

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

8.3.2

8



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T47818  
 Account: LTENCOR - LT Environmental  
 Project: COGCC Project

QC Batch ID: MP11201  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 02/24/10

Metal	LCS Result	Spikelot HGLCD054 % Rec	QC Limits
-------	---------------	----------------------------	--------------

Mercury	7.7	7.34	104.9	72-128
---------	-----	------	-------	--------

Associated samples MP11201: T47818-1, T47818-2

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

8.3.3

8



## 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: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GN20891	2.0	<2.0	mg/kg	40	42.6	106.0	80-120%
Specific Conductivity	GN20938	1.0	<1.0	umhos/cm				

Associated Samples:  
Batch GN20891: T47818-1, T47818-2  
Batch GN20938: T47818-1, T47818-2  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GN20891	T47361-1	mg/kg	1.4	<2.0	14.5	0-20%
Solids, Percent	GN20890	T47818-1	%	90.7	90.9	0.2	0-5%
Specific Conductivity	GN20938	T47113-2	umhos/cm	3200	3200	0.0	0-20%
pH	GN20993	T47818-1	su	8.44	8.34	1.2	0-20%

Associated Samples:

Batch GN20890: T47818-1, T47818-2

Batch GN20891: T47818-1, T47818-2

Batch GN20938: T47818-1, T47818-2

Batch GN20993: T47818-1, T47818-2

Batch MP11178: T47818-2A

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: T47818  
Account: LTENCOR - LT Environmental  
Project: COGCC Project

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GN20891	T47361-1	mg/kg	1.4	40	35.3	84.7	75-125%

Associated Samples:  
Batch GN20891: T47818-1, T47818-2  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits



## Misc. Forms

### Custody Documents and Other Forms

(Accutest New Jersey)

---

Includes the following where applicable:

- Chain of Custody





## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: T47818

Client:

Immediate Client Services Action Required: No

Date / Time Received: 2/20/2010

Delivery Method:

Client Service Action Required at Login: No

Project:

No. Coolers: 1

Airbill #'s:

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <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"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun                        |                          |
| 3. Cooler media:             | Ice (bag)                           |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 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"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 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"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 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                              |                          |

### Sample Integrity - Instructions

Y or N N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 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

Accutest Laboratories  
V: 732.329.0200

2235 US Highway 130  
F: 732.329.3499

Dayton, New Jersey  
www.accutest.com

T47818: Chain of Custody  
Page 2 of 2





## Metals Analysis

### QC Data Summaries

(Accutest New Jersey)

---

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: T47818  
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.  
Project: LTENCOR: COGCC Project

QC Batch ID: MP51613  
Matrix Type: SOLID

Methods: SW846 6020  
Units: mg/kg

Prep Date: 02/23/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.14	.21		
Antimony	0.10	.0076	.0086		
Arsenic	0.20	.03	.044	0.0018	<0.20
Barium	0.20	.005	.015		
Beryllium	0.10	.0028	.012		
Boron	1.0	.11	.1		
Cadmium	0.10	.0044	.0063		
Calcium	50	1.2	1.2		
Chromium	0.80	.015	.12		
Cobalt	0.10	.0006	.0063		
Copper	0.80	.051	.015		
Iron	10	.27	.77		
Lead	0.10	.0012	.0046		
Magnesium	50	.11	.56		
Manganese	0.10	.0024	.0078		
Molybdenum	0.20	.0096	.038		
Nickel	0.80	.038	.01		
Potassium	50	.56	1.5		
Selenium	0.20	.016	.023		
Silver	0.40	.004	.0089		
Sodium	50	.22	.52		
Strontium	0.20	.0016	.0033		
Thallium	0.10	.0008	.002		
Tin	0.20	.0098			
Titanium	0.20	.011	.11		
Uranium	0.20				
Vanadium	0.80	.11	.32		
Zinc	0.80	.16	.37		

Associated samples MP51613: T47818-1, T47818-2, T47818-3

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: T47818  
 Account: ALGC - Accutest Laboratories Gulf Coast, Inc.  
 Project: LTENCOR: COGCC Project

QC Batch ID: MP51613  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date: 02/18/10

Metal	T47555-4 Original MS	Spikelot MPIRS1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	4.3	509	527	95.8
Barium				75-125
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP51613: T47818-1, T47818-2, T47818-3

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T47818  
 Account: ALGC - Accutest Laboratories Gulf Coast, Inc.  
 Project: LTENCOR: COGCC Project

QC Batch ID: MP51613  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date: 02/18/10

Metal	T47555-4 Original	MSD	Spikelot MPIRS1	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	4.3	478	511	92.7	6.3	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP51613: T47818-1, T47818-2, T47818-3

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

Login Number: T47818  
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.  
Project: LTENCOR: COGCC Project

Prep Date: 02/23/10

Metal	BSP Result	Spikelot MPIRS1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	404	400	101.0	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP51613: T47818-1, T47818-2, T47818-3

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: T47818  
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.  
Project: LTENCOR: COGCC Project

QC Batch ID: MP51613  
Matrix Type: SOLID

Methods: SW846 6020  
Units: ug/l

Prep Date: 02/18/10

Metal	T47555-4	Original SDL 10:10%DIF		QC
				Limits

Aluminum				
Antimony				
Arsenic	33.6	33.9	8.2	0-10
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP51613: T47818-1, T47818-2, T47818-3

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