

**DCP CR56 and CR15 SITE  
BN-39-18-4-1-2-1 Pipeline  
HISTORICAL INFORMATION  
FORM 19 SUPPLEMENTAL SOIL REMEDIATION SUMMARY REPORT**

**ATTACHMENTS**

**Tables**

- 1 Summary of Initial Soil Analytical Data (6/24/14)
- 2 Table 1 (APEX) – Soil Sample Analytical Results (10/9/14 and 9/9/15)

**Figures**

- 1 Site Location Map
- 2 Site Map – Excavation Extent and Soil Sample Locations (6/24/14)

**Appendices**

- A Subsurface Soil Remediation Summary Report (APEX Companies, LLC)
  - Figure 1 – Site Location Map
  - Figure 2 – Subsurface Investigation Soil Sample Analytical Results
  - Figure 3 – Confirmation Soil Sample Analytical Results
  - Table 1 – Soil Sample Analytical Results
  - Vironex Injection Services Report
  - Origins Laboratory Report: Job# X410090 (Samples Collected 10/9/14)
  - Origins Laboratory Report: Job# X509114 (Samples Collected 9/9/15)
- B Laboratory Analytical Report (Initial Soil Samples)
  - Summit Scientific 1406189 (Samples Collected 6/24/14)

**TABLE 1**  
**DCP MIDSTREAM**  
**CR56 CR15 Site**  
**INITIAL SOIL ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (Feet bgs)	PID Readings (ppm)	Naphthalene (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TPH <sup>(2)</sup> (mg/kg)	Comments
SS04 @ 4'	6/24/2014	4	NA	0.21	<b>0.19</b>	0.76	0.2	2	129	
SS07 @ 12'	6/24/2014	12	NA	<0.010	0.027	0.057	0.015	0.10	1.7	
SS09 @ 1'	6/24/2014	1	NA	<0.010	0.0073	0.013	<0.0050	0.014	<50	
SS10 @ 3'	6/24/2014	3	NA	<0.010	<0.0020	<0.0050	<0.0050	0.011	<50	
SS11 @ 9'	6/24/2014	9	NA	1.9	<b>4.0</b>	20	6.0	40	<b>2,020</b>	
SS12 @ 5'	6/24/2014	5	NA	<0.010	<b>0.24</b>	0.22	0.018	0.12	1.6	
<b>COGCC Standards for Soil (mg/kg) <sup>(1)</sup></b>				<b>23</b>	<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500</b>	

Notes:

1). Standards for Soil are taken from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

2). TPH - Total volatile and extractable petroleum hydrocarbons. Value calculated by adding GRO and DRO concentrations.

GRO - Gasoline range organics.

DRO - Diesel range organics.

NA - Data not available

mg/kg= Milligrams per kilogram.

bgs - Below ground surface.

ppm - Parts per million

NS - Not Sampled

Bold values indicate an exceedance of the COGCC soil standards for the Site.

**TABLE 1  
SOIL SAMPLE ANALYTICAL RESULTS**

**DCP MIDSTREAM  
WCR 56 & WCR 15  
WELD COUNTY COLORADO**

Soil Sample Analytical Results		Analytes (mg/kg)							
		TPH	GRO	DRO	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene
COGCC Soil Standard		500	500	500	0.17	85	100	175	23
Sample Identification	Date								
B-1 10'	10/9/2014	<b>1,090</b>	<b>904</b>	186	<b>6.97</b>	23.4	4.64	29.3	ND
B-1 12'	10/9/2014	ND	ND	ND	0.01	0.007	ND	0.01	ND
B-2 13'	10/9/2014	171	171	ND	<b>0.87</b>	4.52	0.73	4.76	ND
B-3 12'	10/9/2014	1.85	1.85	ND	<b>0.21</b>	0.11	0.02	0.20	ND
B-4 5'	10/9/2014	0.56	0.56	ND	0.10	ND	0.002	0.06	ND
B-5 8'	10/9/2014	0.45	0.45	ND	0.07	ND	0.002	0.005	ND
B-6 10'	10/9/2014	0.91	0.91	ND	<b>0.18</b>	ND	0.01	0.05	ND
B-7 5'	10/9/2014	ND	ND	ND	0.005	ND	ND	ND	ND
B-8 10'	10/9/2014	128	128	ND	<b>0.33</b>	1.06	0.29	2.05	ND
B-8 13'	10/9/2014	ND	ND	ND	ND	0.002	ND	ND	ND
CSB-1 (10') <sup>1</sup>	9/9/2015	ND	ND	ND	0.008	ND	0.002	0.015	NA
CSB-2 (10') <sup>2</sup>	9/9/2015	ND	ND	ND	ND	ND	ND	ND	NA
CSB-3 (13') <sup>3</sup>	9/9/2015	ND	ND	ND	ND	ND	0.002	0.01	NA
CSB-4 (10') <sup>4</sup>	9/9/2015	ND	ND	ND	ND	ND	ND	ND	NA
CSB-5 (12') <sup>5</sup>	9/9/2015	ND	ND	ND	ND	ND	ND	ND	NA

**Notes**

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics

GRO - gasoline range organics

mg/kg - milligrams per kilogram

NA - not analyzed

ND - not detected

TPH - Total Petroleum Hydrocarbon

VOC - Volatile Organic Compound

Soil concentrations exceeding regulatory standards are in **BOLD**.

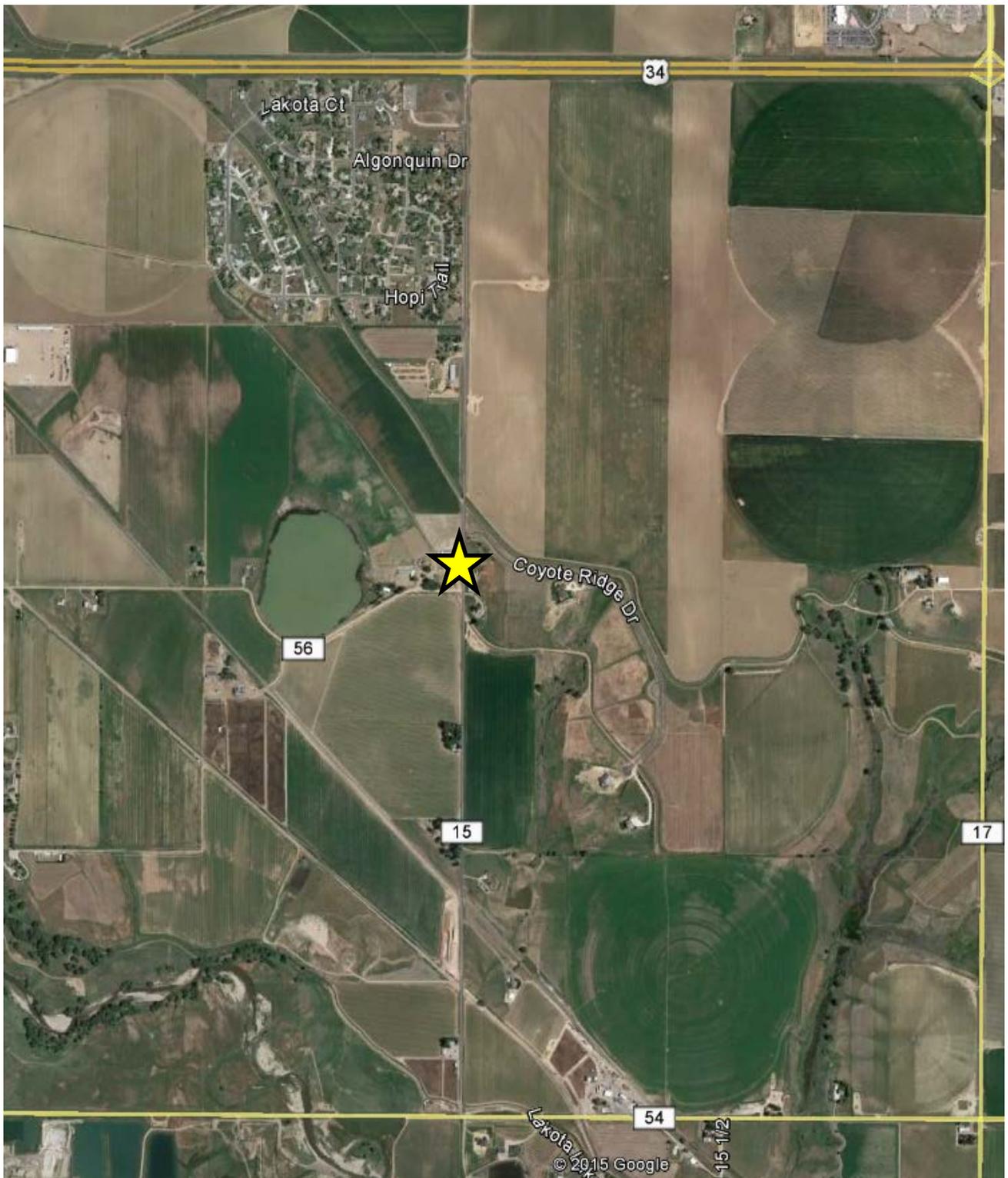
<sup>1</sup> Post-injection confirmation sample collected at boring location B-6 10'.

<sup>2</sup> Post-injection confirmation sample collected at boring location B-8 10'.

<sup>3</sup> Post-injection confirmation sample collected at boring location B-2 13'.

<sup>4</sup> Post-injection confirmation sample collected at boring location B-1 10'.

<sup>5</sup> Post-injection confirmation sample collected at boring location B-3 12'.



**Approximate Site Location**



**Map Source:  
Google Maps – 2015**



6899 Pecos St., Unit C  
Denver, CO 80221

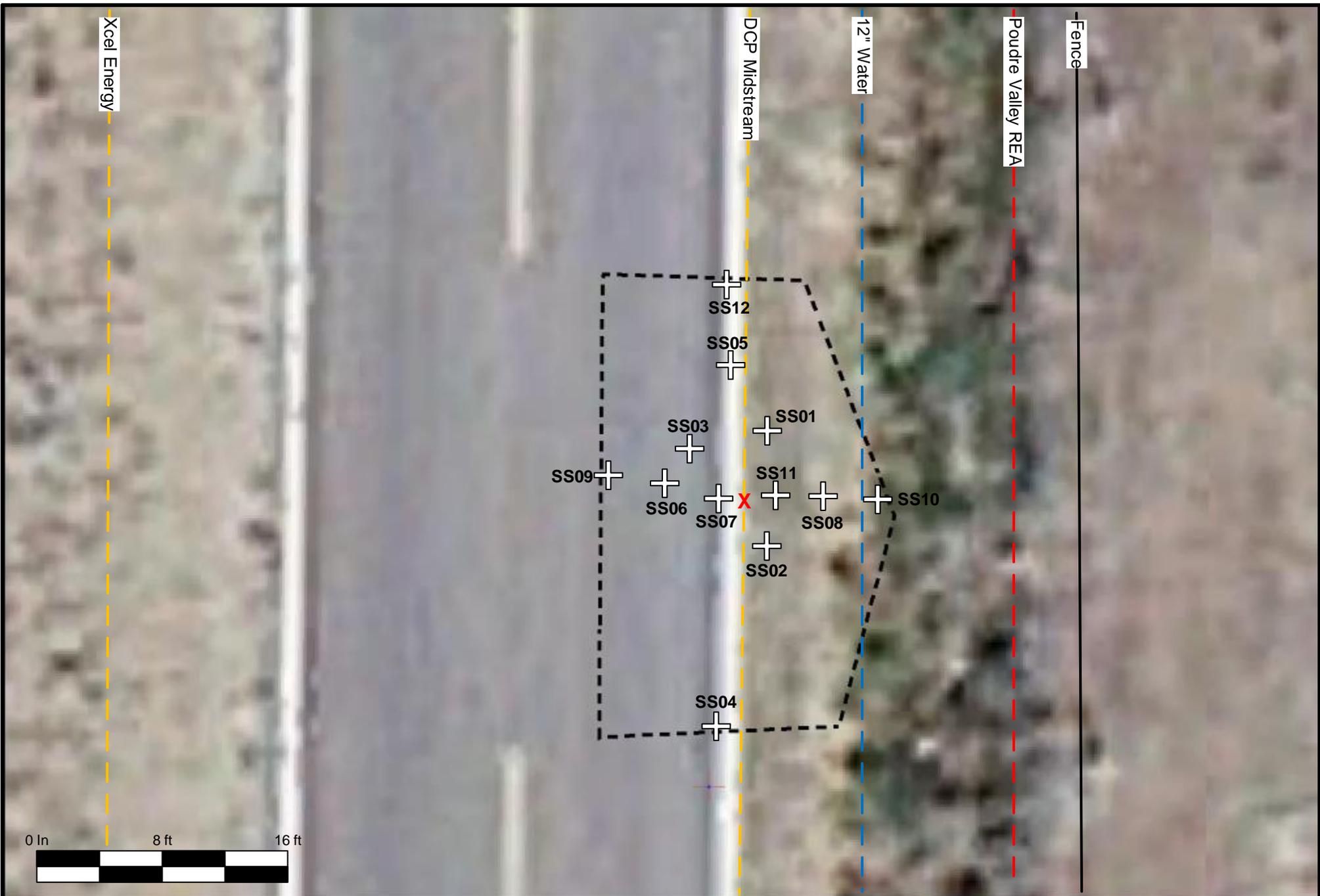
**Figure 1  
Site Location Map**

Soil Remediation Site  
CR-56 & CR-15  
Weld County, Colorado

Client: DCP  
Midstream

Date 9/29/2015

Not to Scale



PROJECT NO:  
 DRAWN BY: BAM  
 DATE: 6/27/2014



6899 Pecos St., Unit C  
 Denver, CO 80221

**Facility Diagram**  
 DCP Midstream  
 CR56 & CR15,  
 Weld County, CO

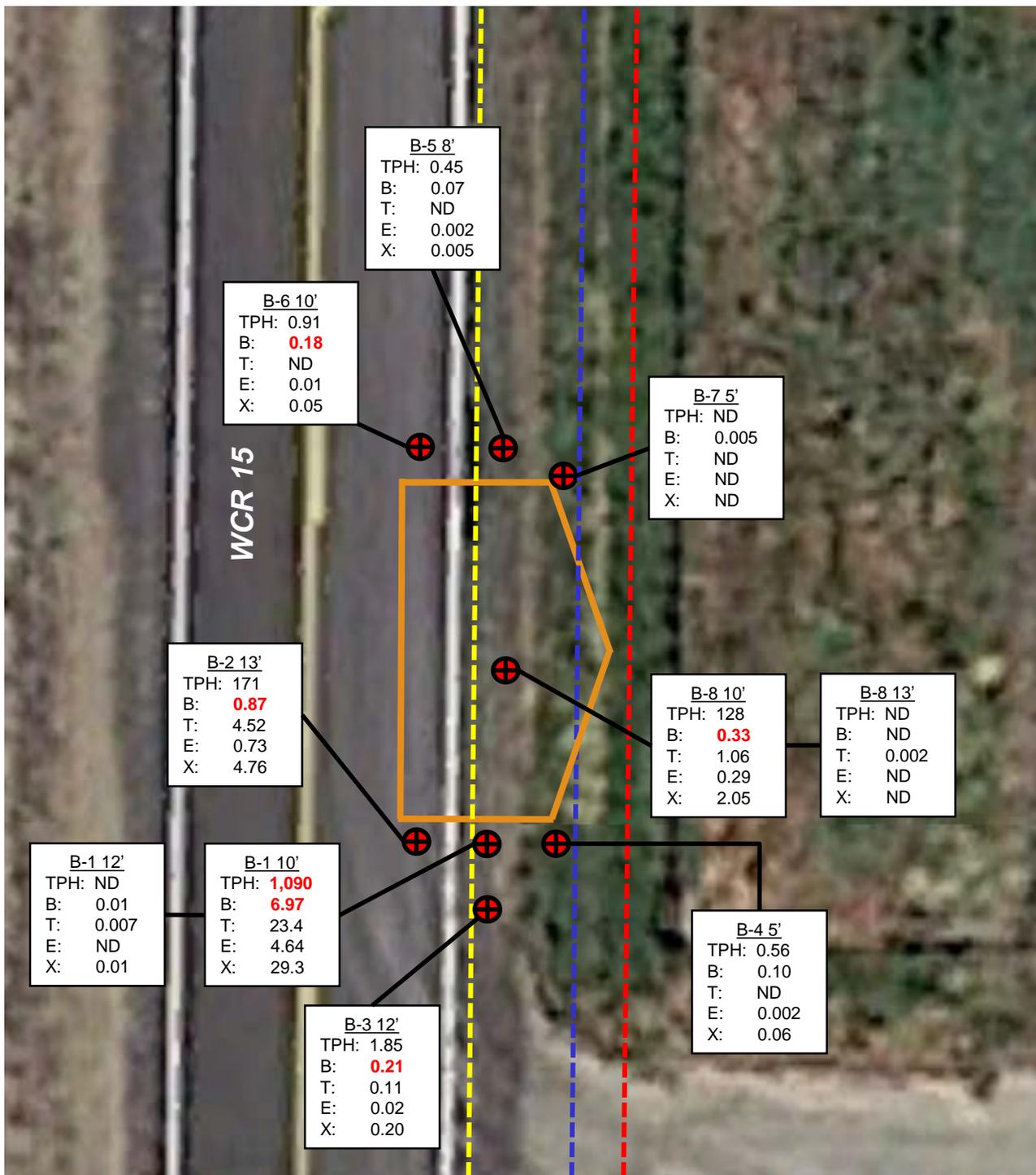
**LEGEND:**

-  Soil Sample and PID Location
-  Excavation Extent
-  Approximate Area of Release

-  Water Line
-  Gas Line
-  Electrical Line



**FIGURE 2**  
 Excavation Extent &  
 Sample Locations



Approximate Excavation Limits  
 10/9/2014 Soil Sample Location

DCP Pipeline  
 Water Line  
 Electric Line

**Legend**  
 TPH – total petroleum hydrocarbons  
 B – benzene  
 T – toluene  
 E – ethylbenzene  
 X – total Xylenes  
 ND – not detected  
**Bold** – Concentrations exceeded cleanup standard  
 All analytical results are in milligrams per kilogram



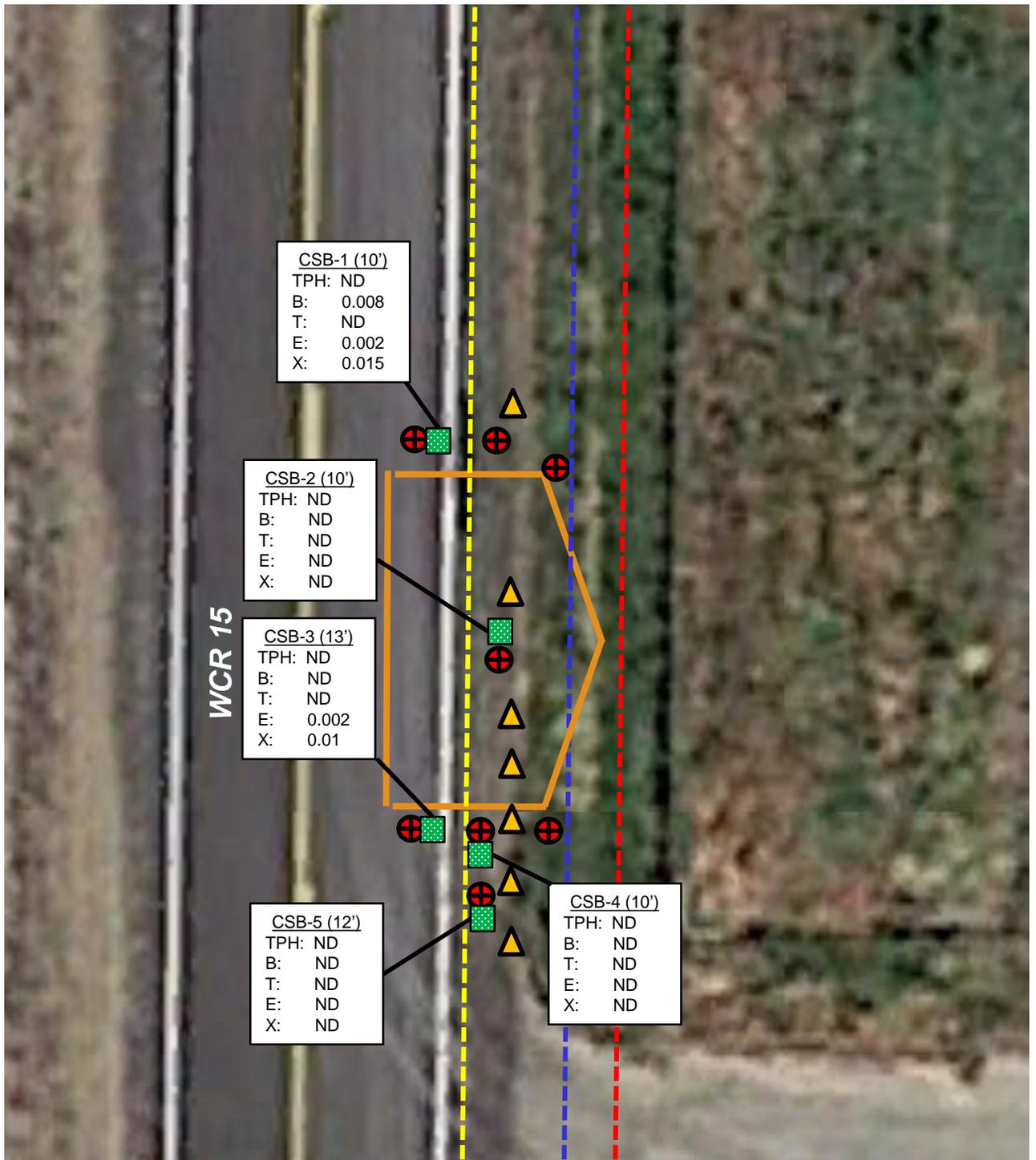
Map Source: Google Maps - 2015

1746 Cole Blvd. Bldg 21 Ste 265  
 Lakewood, Colorado  
 80401

**Figure 2**  
**Subsurface Investigation**  
**Soil Sample Analytical**  
**Results**

Subsurface Investigation  
 CR-56 & CR-15 Condensate Release  
 Weld County, Colorado

Client: DCP Midstream
Project# 420159-001
Drawn by: HNO
Date: 8/28/15
Not to Scale
<b>2</b>



- Approximate Excavation Limits
- ⊕ 10/9/2014 Soil Sample Location
- 9/9/2015 Confirmation Soil Sample Location
- ▲ H2O2 Injection Point
- DCP Pipeline
- Water Line
- Electric Line

**Legend**  
 TPH – total petroleum hydrocarbons  
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Map Source: Google Maps - 2015



1746 Cole Blvd. Bldg 21 Ste 265  
 Lakewood, Colorado  
 80401

**Figure 3**  
**Confirmation Soil Sample**  
**Analytical Results**

Soil Remediation Site  
 CR-56 & CR-15  
 Weld County, Colorado

Client: DCP Midstream
Project# 420159-001
Drawn by: DJP
Date: 10/23/15
Not to Scale
<b>2</b>



October 16, 2015

Sam Wood  
Compliance Coordinator  
DCP Midstream, LP  
3026 4<sup>th</sup> Avenue  
Greeley, Colorado 80631

Re:           **Subsurface Soil Remediation**  
              **County Road 56 & 15**  
              **Weld County, Colorado**

**Apex Project#: 420159-001**

Dear Mr. Wood:

Apex Companies, LLC (Apex) was retained by DCP Midstream, LP (DCP) to provide soil remediation services at a former condensate pipeline release site near the intersection of County Road 56 and County Road 15 in Weld County, Colorado (Figure 1). Apex understands that impacted soil had previously been excavated; however, impacted soil remained at the site at approximately 10 to 13 feet below ground surface (bgs). Apex submitted a proposal on September 2, 2014 (No. 091514) to treat the impacted soils in-situ through hydrogen peroxide injections. A detailed summary of soil sampling and the injection activities is presented below.

### **Subsurface Investigation**

After 811 utility locates were requested and received, Apex completed potholing activities using Diversified Underground to daylight known buried utilities within the treatment area prior to conducting drilling operations. On October 9, 2014 Apex conducted a subsurface investigation and advanced eight (8) soil borings and collected 10 soil samples. The soil samples were collected using a Geoprobe 6620DT direct push rig provided by Vironex. The soil samples were collected to provide a baseline of soil concentrations and to assist in determining a remediation strategy.

The soil samples were collected in laboratory-supplied containers, placed on ice to minimize volatilization and hand delivered under appropriate chain-of-custody (COC) to Origins Laboratory, Inc. (Origins) in Denver, Colorado. The soil samples were analyzed for total petroleum hydrocarbons (TPH) gasoline range organics (GRO) and TPH diesel range organics (DRO) using Environmental Protection Agency (EPA) Method 8015 and benzene, toluene, ethylbenzene, total xylenes (BTEX) and naphthalene using EPA Method 8260B.

The soil sample collected at soil boring B-1 @ 10' had a TPH concentration of 1,090 milligram per kilogram (mg/kg) exceeding the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 cleanup goal of 500 mg/kg. Benzene concentrations ranged from 0.18 mg/kg to 6.97 mg/kg in the soil samples collected from soil borings B-1 @ 10', B-2 @ 13', B-3 @ 12', B-6 @ 10', and B-8 @ 10' exceeding the COGCC Table 910-1 cleanup standard of 0.17 mg/kg. Toluene, ethylbenzene, and total xylenes were detected in several of the soil samples but the concentrations were below the COGCC Table 910-1 cleanup standards. Naphthalene was not detected in any of the soil samples. The soil analytical results are summarized in Figure 2 and Table 1. The laboratory analytical report from Origins is included as an attachment to this report.

## **Injection Activities**

After 811 utility locates were requested and received, Apex completed potholing activities using Diversified Underground to daylight known buried utilities within the treatment area prior to conducting injection services using Vironex. On June 29, 2015, Apex marked out the injection points and ventilation well locations within the treatment zone. While advancing 2.25-inch rods during installation of a ventilation well, an unmarked 12-inch water line was punctured by the Vironex crew. The fire department and local police department were immediately notified of the line break, and the Little Thompson Water District was alerted of the incident. The project was postponed pending repair to the line.

On July 1, 2015, Vironex remobilized personnel and equipment to the site from Golden, Colorado. Upon arrival on site, the Vironex crew staged injection equipment. Chemical products had been delivered by Univar on Friday, June 26, 2015 and delivery was taken by onsite personnel. Vironex commenced hydrogen peroxide injection activities at seven temporary direct push technology (DPT) injection points following a health and safety briefing. Direct push technology (DPT) points were advanced using a Geoprobe 6620DT direct push rig to 15 feet below ground surface (bgs) using 1.5-inch steel injection rod and 5 foot fixed open injection tooling.

Prior to injection to the subsurface, hydrogen peroxide was diluted from a 31% stock concentration to a 3.5 % weight/weight (w/w) solution in 250-gallon stainless steel mix tanks using fresh water sourced from a locally-supplied water delivery truck. The iron catalyst solution was mixed in a separate 250 gallon poly tote staged adjacent to the injection rig. Catalyst mixtures were prepared by mixing 9 pounds of ferrous sulfate and 3 pounds of citric acid with 210 gallons of mix water.

During injection activities, hydrogen peroxide solution was injected into the subsurface using a 3L8 progressive cavity pump fitted with dedicated flow meters/totalizers and pressure gauges. Catalyst was delivered to the subsurface using a centrifugal pump fitted with separate dedicated flow meters/totalizers and pressure gauges. Hydrogen peroxide and catalyst delivery lines were connected on opposite ends of the injection cap to minimize contact pre-injection. Hydrogen peroxide and catalyst were delivered as separate slugs using 10 gallon flush water pillows to minimize reaction above ground surface. DPT points were connected to an injection cap fitted with dedicated shut-off valves, pressure relief valves, and a pressure gauge.

On July 1, 2015, Vironex injected 50 gallons of hydrogen peroxide (31%), 19 pounds of ferrous sulfate and 6 pounds of citric acid as 881 gallons of solution into seven DPT points at flow rates ranging from 1.3 to 9.5 gallons per minute (gpm) at pressures ranging from 0 to 40 pounds per square inch (psi). Significant surfacing occurred as a result of hydrogen peroxide reactivity while injecting at DPT.

On July 2, 2015, Vironex injected 52 gallons of hydrogen peroxide (31%), 8 pounds of ferrous sulfate and 2 pounds of citric acid as 663 gallons of solution into seven DPT points at flow rates ranging from 0.5 to 4.0 gpm at pressures ranging from 0 to 50 PSI. In an attempt to counteract surfacing issues, less catalyst was introduced during injection in an attempt to decrease the reaction rate of hydrogen peroxide in the subsurface. However, surfacing continued to occur during injection.

Following injection activities, mixing tanks, hoses and injection equipment were flushed with fresh water. Two empty hydrogen peroxide drums and one unopened drum of hydrogen peroxide (31%) were taken off-site by Univar following injection activities.

Due to the amount of surfacing observed during injection activities, the remaining five proposed injection locations were abandoned. In total, 102 gallons of hydrogen peroxide (31%), 27 pounds of ferrous sulfate, and 8 pounds of citric acid was delivered to the subsurface as 1,544 gallons of solution at seven DPT points. Observed injection flow rates ranged from 0.5 to 9.5 gpm and injection pressures measured at the on board manifold ranged from 0 to 50 psi. Surfacing was observed throughout the injection program as a direct result of chemical reactions following introduction of hydrogen peroxide to subsurface contaminants. Vironex's Injection Services Report is included as an attachment.

### **Confirmation Soil Sampling**

On September 9, 2015, Apex collected five (5) confirmation soil samples using a direct push drilling rig provided by Site Services after potholing the locations and requesting utility locates by calling 811. The five confirmation soil samples (CSB-1 through CSB-5) correspond with the five soil samples that had soil sample concentrations exceeding COGCC soil standards during the initial soil sampling conducted on October 9, 2014. The soil samples were collected in laboratory-supplied containers, placed on ice to minimize volatilization and hand delivered under appropriate chain-of-custody (COC) to Origins. The soil samples were analyzed BTEX using EPA Method 8260B. In addition, soil samples were analyzed for TPH-GRO and TPH-DRO using EPA Method 8015. The soil samples were not analyzed for naphthalene since the compound was not detected during the initial soil sampling event.

### **Analytical Results & Conclusions**

Laboratory analytical results indicate that all five (5) soil samples had detected concentrations of BTEX or TPH below COGCC Table 910-1 soil standards. Only two (2) of the five (5) soil samples had detections. TPH was not detected in any of the five samples. The soil sample collected at CSB-1 had detections of benzene, ethylbenzene, and total xylenes of 0.008 mg/kg, 0.002 mg/kg, and 0.015 mg/kg, respectively. The soil sample collected at CSB-3 had detections of ethylbenzene and total xylenes of 0.002 mg/kg and 0.01 mg/kg, respectively. Soil sample laboratory analytical results are presented in the attached Figure 3 and Table 1. The laboratory analytical report is also included as an attachment.

Based on the laboratory analytical results from soil sampling, it appears remedial efforts were successful in treating impacted soils associated with the condensate line leak.

Apex appreciates the opportunity to provide remediation services on this project. If you have questions or comments regarding the information in this report or if we can be of further assistance, please do not hesitate to contact Apex at (303) 487-1020.

Sincerely,  
**APEX COMPANIES, LLC**



Heather Otterstetter, P.E.  
Project Manager

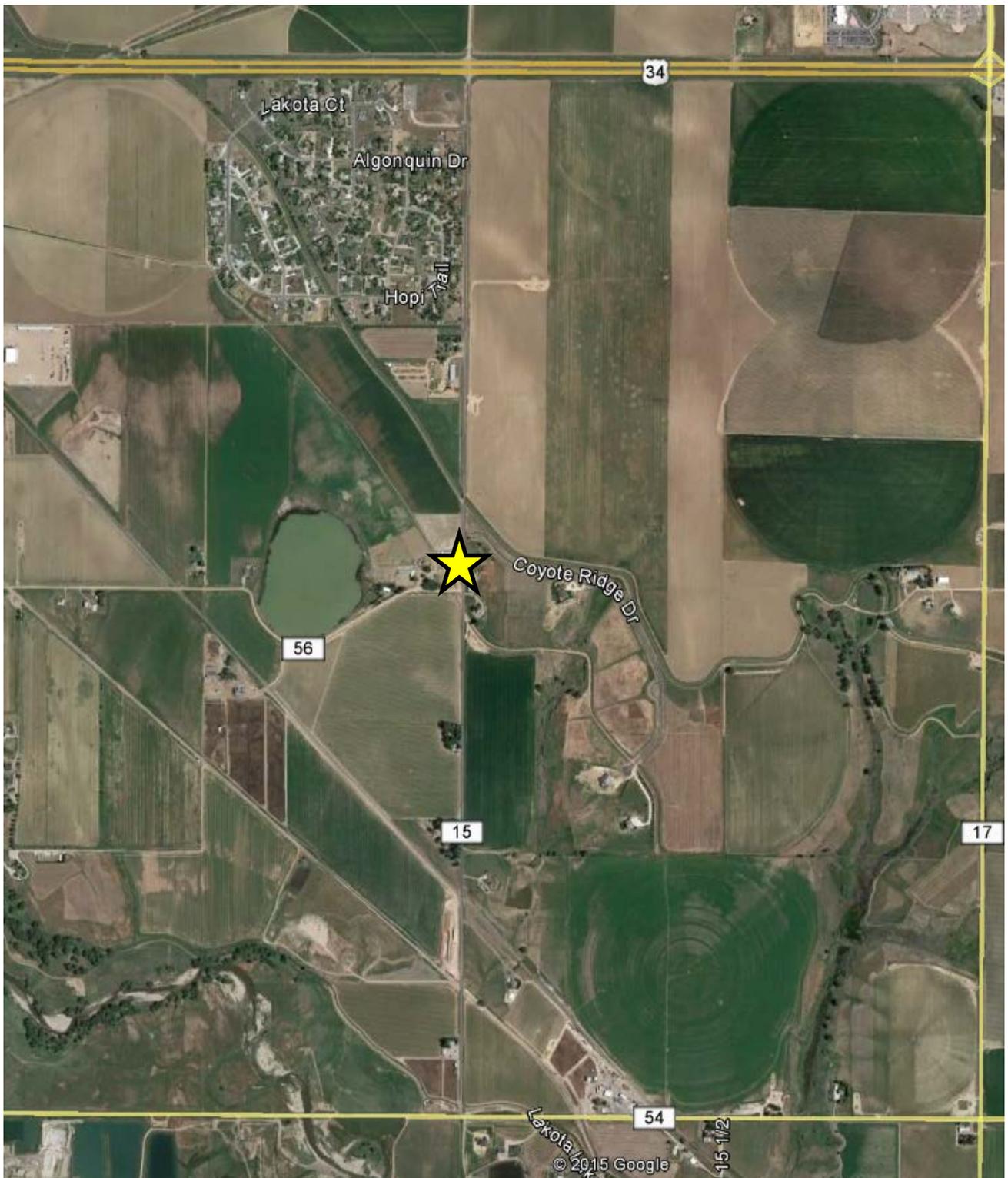


David Puchrik  
Senior Geologist

#### Attachments:

Figure 1 – Site Location Map  
Figure 2 – Subsurface Investigation Soil Sample Analytical Results  
Figure 3 – Confirmation Soil Sample Analytical Results  
Table 1 – Soil Sample Analytical Results  
Vironex Injection Services Report  
Laboratory Analytical Data and Chain of Custody

## FIGURES



**Approximate Site Location**



**Map Source:**  
Google Maps – 2015



1746 Cole Blvd. Bldg 21 Ste 265  
Lakewood, Colorado  
80401

**Figure 1**  
**Site Location Map**

Soil Remediation Site  
CR-56 & CR-15  
Weld County, Colorado

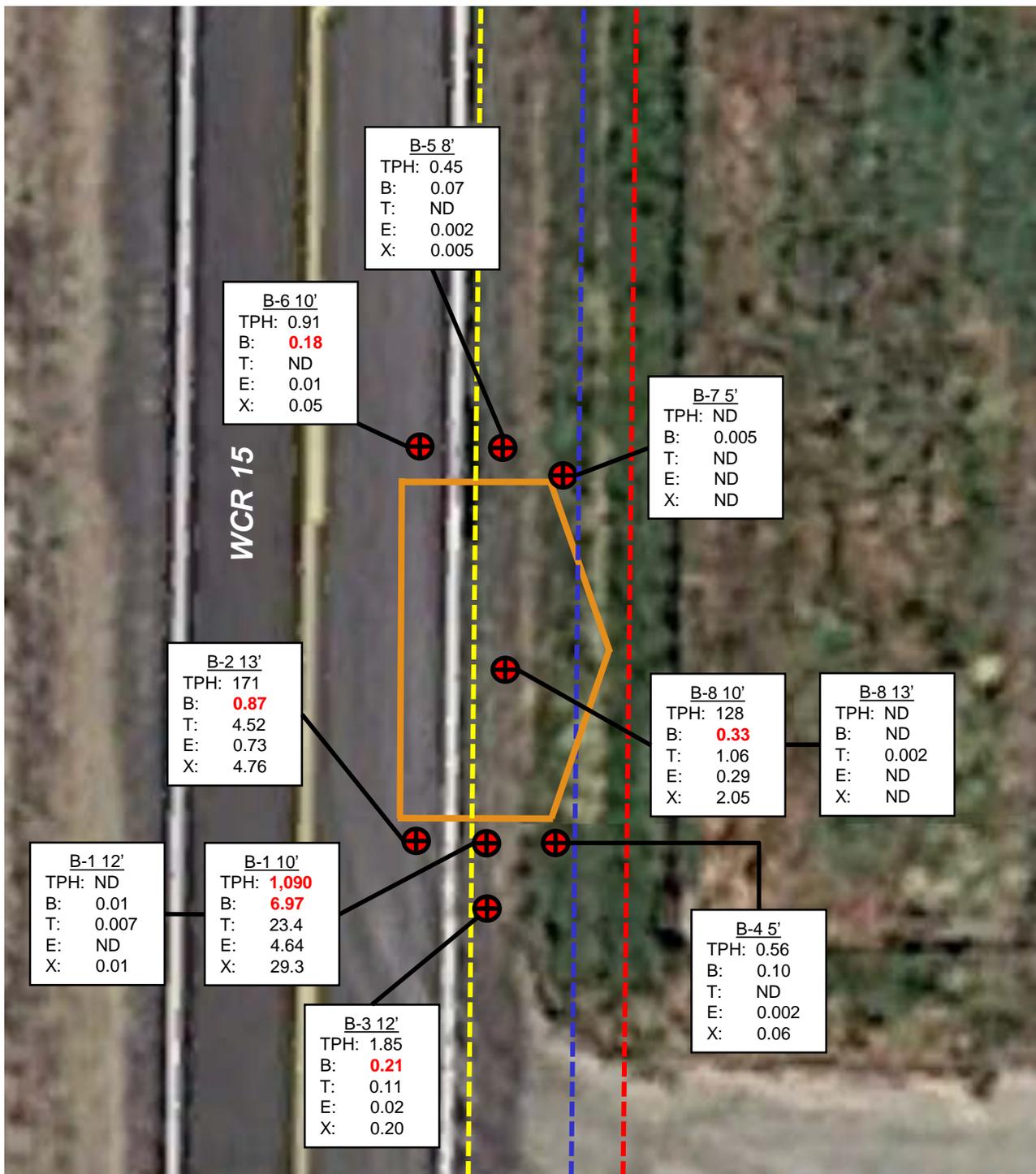
Client: DCP  
Midstream

Project# 420159-001

Drawn by: HNO

Date 9/29/2015

Not to Scale



 Approximate Excavation Limits  
 10/9/2014 Soil Sample Location

 DCP Pipeline  
 Water Line  
 Electric Line

**Legend**  
 TPH – total petroleum hydrocarbons  
 B – benzene  
 T – toluene  
 E – ethylbenzene  
 X – total Xylenes  
 ND – not detected  
**Bold** – Concentrations exceeded cleanup standard  
 All analytical results are in milligrams per kilogram



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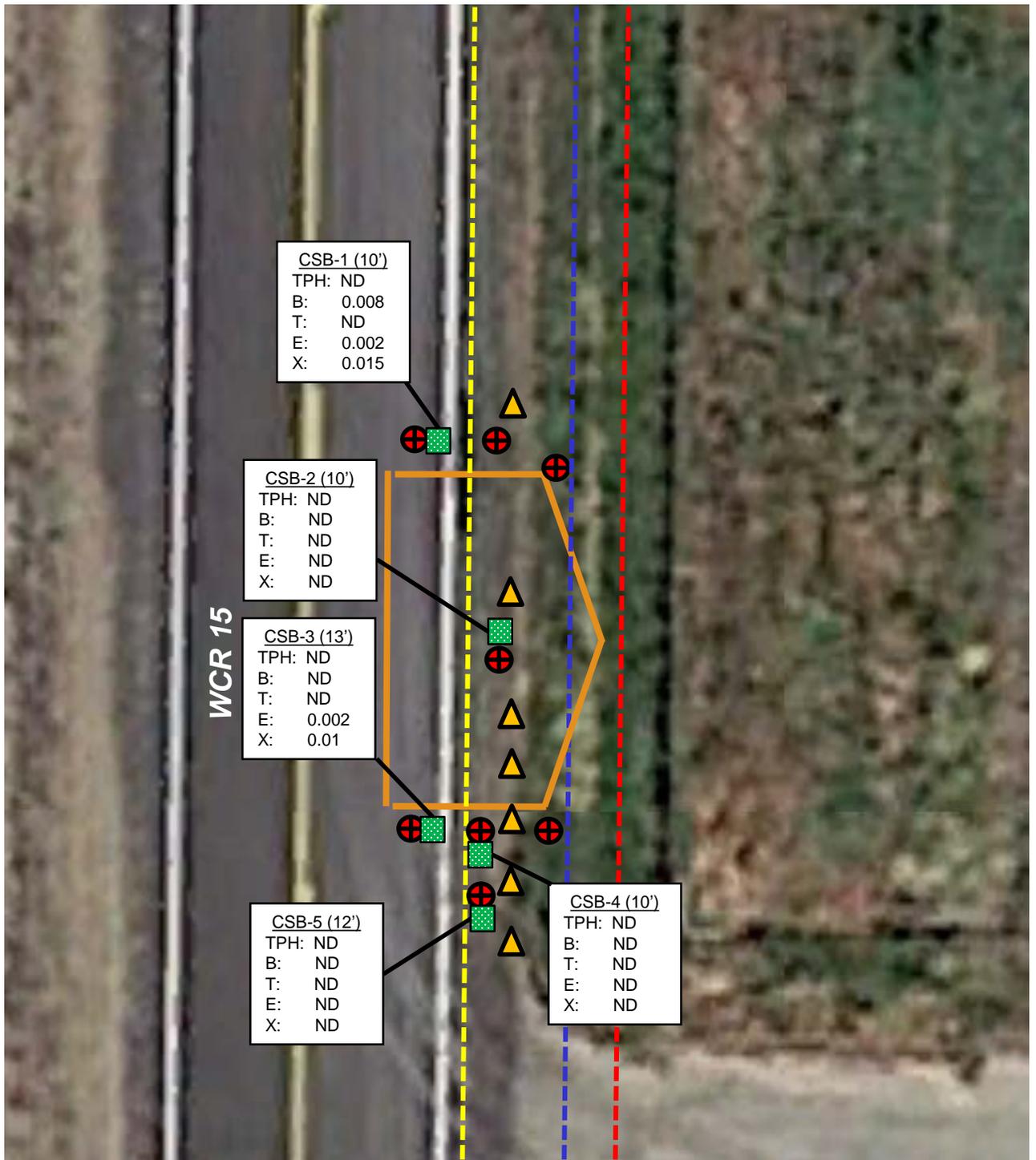


1746 Cole Blvd. Bldg 21 Ste 265  
 Lakewood, Colorado  
 80401

**Figure 2**  
**Subsurface Investigation**  
**Soil Sample Analytical**  
**Results**

Subsurface Investigation  
 CR-56 & CR-15 Condensate Release  
 Weld County, Colorado

Client: DCP Midstream
Project# 420159-001
Drawn by: HNO
Date: 8/28/15
Not to Scale
<b>2</b>



- Approximate Excavation Limits
- H2O2 Injection Point
- DCP Pipeline
- 10/9/2014 Soil Sample Location
- Water Line
- 9/9/2015 Confirmation Soil Sample Location
- Electric Line

**Legend**  
 TPH – total petroleum hydrocarbons  
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Map Source: Google Maps - 2015



1746 Cole Blvd. Bldg 21 Ste 265  
 Lakewood, Colorado  
 80401

**Figure 3**  
**Confirmation Soil Sample**  
**Analytical Results**

Soil Remediation Site  
 CR-56 & CR-15  
 Weld County, Colorado

Client: DCP Midstream
Project# 420159-001
Drawn by: DJP
Date: 10/23/15
Not to Scale
<b>2</b>

## **TABLES**

**TABLE 1  
SOIL SAMPLE ANALYTICAL RESULTS**

**DCP MIDSTREAM  
WCR 56 & WCR 15  
WELD COUNTY COLORADO**

Soil Sample Analytical Results		Analytes (mg/kg)							
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CSB-2 (10') <sup>2</sup>	9/9/2015	ND	ND	ND	ND	ND	ND	ND	NA
CSB-3 (13') <sup>3</sup>	9/9/2015	ND	ND	ND	ND	ND	0.002	0.01	NA
CSB-4 (10') <sup>4</sup>	9/9/2015	ND	ND	ND	ND	ND	ND	ND	NA
CSB-5 (12') <sup>5</sup>	9/9/2015	ND	ND	ND	ND	ND	ND	ND	NA

**Notes**

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics

GRO - gasoline range organics

mg/kg - milligrams per kilogram

NA - not analyzed

ND - not detected

TPH - Total Petroleum Hydrocarbon

VOC - Volatile Organic Compound

Soil concentrations exceeding regulatory standards are in **BOLD**.

<sup>1</sup> Post-injection confirmation sample collected at boring location B-6 10'.

<sup>2</sup> Post-injection confirmation sample collected at boring location B-8 10'.

<sup>3</sup> Post-injection confirmation sample collected at boring location B-2 13'.

<sup>4</sup> Post-injection confirmation sample collected at boring location B-1 10'.

<sup>5</sup> Post-injection confirmation sample collected at boring location B-3 12'.

## **VIRONEX INJECTION SERVICES REPORT**

# Injection Services Report

Prepared for:



Prepared by:



Hydrogen Peroxide Injection Program

Weld County, Colorado

June 29 to July 2, 2015

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## Project Summary

**Project Name:** APEX Companies, LLC – Hydrogen Peroxide Injection Program - Weld County, Colorado

**Project Dates:** June 29 through July 3, 2015

**Equipment/Manpower:**

- John Crowley – Vironex Injection Operator / Field Manager
- Joe Burchfield – Vironex Injection Operator/Field Manager
- Joey Sherman – Vironex Environmental Field Technician
- Jonathan Zimmer – Vironex Environmental Field Technician
- Mike Jahn – Vironex Project Manager
- Vironex Custom-built Injection Rig – CO-11
- Vironex Track Mounted Geoprobe – CO-03

**Proposed Scope of Work:**

Vironex will mobilize to Weld County, Colorado for injection of catalyzed hydrogen peroxide at up to 12 temporary direct push points.

**Project Summary:**

Prior to conducting injection services and following 811 Utility locate requests, APEX Companies, LLC (APEX) completed potholing activities with a subcontractor to daylight known buried utilities within the treatment area. On June 29, 2015, Apex marked out the injection points and ventilation well locations within the treatment zone. While advancing 2.25-inch rods during installation of a ventilation well, an unmarked 12-inch water line was punctured by the Vironex crew. The fire department and local police department were immediately notified of the line break, and the Little Thompson Water District was alerted of the incident. The project was postponed pending repair to the line.

On July 1, 2015 Vironex remobilized personnel and equipment to the site from Golden, Colorado. Upon arrival on site the Vironex crew staged injection equipment. Chemical products had been delivered by Univar on Friday, June 26 and delivery was taken by onsite personnel. On July 1, 2015, following a health and safety briefing, Vironex commenced hydrogen peroxide injection activities at seven temporary direct push technology (DPT) injection points. DPT points were advanced using a Geoprobe 6620DT to 15 feet below ground surface (bgs) using 1.5-inch steel injection rod and 5 foot fixed open injection tooling.

Prior to injection to the subsurface, hydrogen peroxide was diluted from a 31% stock concentration to a 3.5 % weight/weight (w/w) solution in 250-gallon stainless steel mix tanks using fresh water sourced from a locally supplied water delivery truck. The iron catalyst solution was mixed in a separate 250 gallon poly tote staged adjacent to the injection rig. Catalyst mixtures were prepared by mixing 9 pounds of ferrous sulfate and 3 pounds of citric acid with 210 gallons of mix water.

During injection activities, hydrogen peroxide solution was delivered to the subsurface using a 3L8 progressive cavity pump fitted with dedicated flow meters/totalizers and pressure gauges. Catalyst was delivered to the subsurface using a centrifugal pump fitted with separate dedicated flow meters/totalizers and pressure gauges. Hydrogen peroxide and catalyst delivery lines were connected on opposite ends of the injection cap to minimize contact pre-injection. Hydrogen peroxide and catalyst were delivered as separate slugs using 10 gallon flush water pillows to minimize reaction above ground surface. DPT points were connected to an injection cap fitted with dedicated shut-off valves, pressure relief valves, and a pressure gauge.

On July 1, 2015, Vironex injected 50 gallons of hydrogen peroxide (31%), 19 pounds of ferrous sulfate and 6 pounds of citric acid as 881 gallons of solution into seven DPT points at flow rates ranging from 1.3 to 9.5 gallons per minute (gpm) at pressures ranging from 0 to 40 pounds per square inch (PSI). Significant surfacing occurred as a result of hydrogen peroxide reactivity while injecting at DPT points IP-3, IP-4 and IP-5.

On July 2, 2015, Vironex injected 52 gallons of hydrogen peroxide (31%), 8 pounds of ferrous sulfate and 2 pounds of citric acid as 663 gallons of solution into seven DPT points at flow rates ranging from 0.5 to 4.0 gpm at pressures ranging from 0 to 50 PSI. In an attempt to counteract surfacing issues, less catalyst was introduced during injection in an attempt to decrease the reaction rate of hydrogen peroxide in the subsurface. However, surfacing occurred during injection at IP-2, IP-3, IP-4, IP-5 and IP-6.

Following injection activities, mixing tanks, hoses and injection equipment were flushed with fresh water. Two empty hydrogen peroxide drums and one unopened drum of hydrogen peroxide (31%) were taken off-site by Univar following injection activities.

Due to the amount of surfacing observed during injection activities, the remaining five proposed injection locations were abandoned by APEX. In total, 102 gallons of hydrogen peroxide (31%), 27 pounds of ferrous sulfate, and 8 pounds of citric acid was delivered to the subsurface as 1,544 gallons of solution at seven DPT points. Observed injection flow rates ranged from 0.5 to 9.5 gpm and injection pressures measured at the on board manifold ranged from 0 to 50 PSI. Surfacing was observed throughout the injection program as a direct result of chemical reactions following introduction of hydrogen peroxide to subsurface contaminants. A daily injection summary is presented on page 4 of this report and field logs are provided in the Appendix.

Site Map



## Daily Injection Summary

Injection Summary						
Date	Points Completed	Hydrogen Peroxide (31%) Gallons	Ferrous Sulfate Pounds	Citric Acid Pounds	Pillow Flush Water Gallons	Total Solution Volume Gallons
07/01/15	0	50	19	6	80	881
07/02/15	7	52	8	2	40	663
<b>Total</b>	7	102	27	8	120	1,544
<b>Design</b>	12	148	56	17	480	2,636

## Project Photographs

DPT injection points in treatment area



Custom Injection Rig set-up adjacent to treatment area





## Appendix – Injection Logs

**DAILY INJECTION FIELD LOG SHEET**



Apex - Weld County Peroxide Injection Program

Injection Rig Operator: John Crowley

**Injection Scope of work:** Hydrogen peroxide will be mixed with dilution water in stainless steel mix tanks to create a 3.5 % w/w solution. A secondary mix tank will be used to mix hydrated ferrous sulfate and citric acid (catalyst). Peroxide and Catalyst will be introduced as 55 gallon batches throughout the injection program not including pillow flush water.

**Injection Approach:** Hydrogen peroxide and catalyst will be injected at 12 DPT locations using a 5-foot fixed-open injection tool between 10 and 15 feet bgs. Each injection location will receive 110 gallons of 3.5% peroxide solution and 110 gallons of catalyst. 10 gallons of fresh pillow water will be injected between introductions of peroxide and catalyst.

Boring ID	Date	Start Time	End Time	Injection Interval	Max Pressure (PSI)	Average Pressure (PSI)	Average Flow Rate (gpm)	Hydrogen Peroxide (31%) Gallons	Ferrous Sulfate Pounds	Citric Acid Pounds	Pillow Flush Water Gallons	Total Solution Volume Gallons	Injection Site Notes	
IP-1	07/01/15	10:30 AM	11:07 AM	10 to 15	25	0	1.5	6.2			10.0	55		
		11:10 AM	11:32 AM	10 to 15	40	20	9.5		8.9	2.7	10.0	210		
		11:47 AM	12:12 PM	10 to 15	5	0	2.2	6.2			10.0	55		
		12:20 PM	12:40 PM	10 to 15			2.8		2.3	0.7	10.0	55		
	07/02/15	9:24 AM	10:03 AM	10 to 15	50	40	1.4	6.2			10.0	55		
		1:42 PM	2:12 PM	10 to 15	50	40	1.8	6.2			10.0	55		
		8:58 AM	9:03 AM	10 to 15	25	20	4.0		0.8	0.3		20		
	<b>Total Injected Volume</b>								24.7	12.1	3.7	40.0	505	

IP-2	07/01/15	10:35 AM	11:08 AM	10 to 15	15	0	1.7	6.2			10.0	55		
		11:10 AM	11:32 AM	10 to 15	30	20	2.5		2.3	0.7	10.0	55		
		11:47 AM	12:10 PM	10 to 15	10	0	2.4	6.2			10.0	55		
		12:20 PM	12:40 PM	10 to 15			2.8		2.3	0.7	10.0	55		
		1:43 PM	1:50 PM	10 to 15	10	10	2.3	1.8				16		
		07/02/15	10:36 AM	10:39 AM	10 to 15	20	20	0.7	0.2			2	Immediate surfacing 5 feet from Injection location.	
		1:38 PM	1:41 PM	10 to 15	20	20	1.3	0.4			4	Immediate surfacing 8 feet from Injection location.		
		8:59 AM	9:03 AM	10 to 15	10	10	2.5		0.4	0.1		10	Surfacing 5 feet from injection location.	
	<b>Total Injected Volume</b>								14.8	5.1	1.5	40.0	252	

IP-3	07/01/15	12:42 PM	12:50 PM	10 to 15	0	0	2.4	2.1				19	12:50 PM: Major surfacing from borehole, stopped pumping.
		07/02/15	9:05 AM	9:13 AM	10 to 15	5	5	1.8		0.6	0.2	10.0	14
		10:30 AM	10:35 AM	10 to 15	15	10	1.0	0.6				5	Immediate surfacing.
		1:32 PM	1:37 PM	10 to 15	5	5	1.2	0.7				6	Immediate surfacing.
	<b>Total Injected Volume</b>								3.4	0.6	0.2	10.0	44

**DAILY INJECTION FIELD LOG SHEET**



Apex - Weld County Peroxide Injection Program

Injection Rig Operator: John Crowley

**Injection Scope of work:** Hydrogen peroxide will be mixed with dilution water in stainless steel mix tanks to create a 3.5 % w/w solution. A secondary mix tank will be used to mix hydrated ferrous sulfate and citric acid (catalyst). Peroxide and Catalyst will be introduced as 55 gallon batches throughout the injection program not including pillow flush water.

**Injection Approach:** Hydrogen peroxide and catalyst will be injected at 12 DPT locations using a 5-foot fixed-open injection tool between 10 and 15 feet bgs. Each injection location will receive 110 gallons of 3.5% peroxide solution and 110 gallons of catalyst. 10 gallons of fresh pillow water will be injected between introductions of peroxide and catalyst.

Boring ID	Date	Start Time	End Time	Injection Interval	Max Pressure (PSI)	Average Pressure (PSI)	Average Flow Rate (gpm)	Hydrogen Peroxide (31%) Gallons	Ferrous Sulfate Pounds	Citric Acid Pounds	Pillow Flush Water Gallons	Total Solution Volume Gallons	Injection Site Notes
IP-4	07/01/15	12:42 PM	12:55 PM	10 to 15	0	0	2.4	3.5				31	12:55 PM: Major surfacing from borehole, stopped pumping.
				10 to 15									
	07/02/15	10:17 AM	10:18 AM	10 to 15	0	0	1.0	0.1				1	Immediate surfacing up borehole.
				10 to 15									
		1:30 PM	1:31 PM	10 to 15	0	0	1.0	0.1				1	Immediate surfacing up borehole.
				10 to 15									
	9:14 AM	9:15 AM	10 to 15	10 to 15	10	10	2.0		0.1	0.0		2	Immediate surfacing up borehole.
			10 to 15										

**Total Injected Volume**      3.7      0.1      0.0      0.0      35

IP-5	07/01/15	1:19 PM	1:24 PM	10 to 15	0	0	1.6	0.9				8	1:24 PM: Major surfacing from borehole, stopped pumping.
				10 to 15									
	07/02/15	10:24 AM	10:25 AM	10 to 15	15	15	2.0	0.2				2	Immediate surfacing up borehole.
				10 to 15									
		1:27 PM	1:29 PM	10 to 15	15	15	0.5	0.1				1	Immediate surfacing up borehole.
				10 to 15									
	9:15 AM	9:17 AM	10 to 15	10 to 15	10	10	2.5		0.2	0.1		5	Immediate surfacing up borehole.
			10 to 15										

**Total Injected Volume**      1.2      0.2      0.1      0.0      16

IP-6	07/01/15	1:26 PM	1:35 PM	10 to 15	0	0	1.3	1.3				12	
				10 to 15									
	07/02/15	9:18 AM	10:15 AM	10 to 15	15	15	2.6		6.4	1.9		150	
				10 to 15							10.0		
		10:26 AM	10:28 AM	10 to 15	25	20	2.5	0.6				5	Surfacing 5 feet from injection location.
		12:59 PM	1:25 PM	10 to 15	45	35	2.0	5.7				51	
	2:35 PM	3:45 PM	10 to 15	20	20	1.1	8.9				79		

**Total Injected Volume**      16.5      6.4      1.9      10.0      297

IP-7	07/01/15	2:24 PM	3:46 PM	10 to 15	25	25	1.7	15.7				140	
				10 to 15							10.0		
				10 to 15					2.5	0.8		60	
				10 to 15							10.0		
	07/02/15	10:52 AM	12:52 PM	10 to 15	50	15	1.3	16.8				150	
				10 to 15									
	2:13 PM	2:32 PM	10 to 15	45	40	2.4	5.1				45		
			10 to 15										

**Total Injected Volume**      37.6      2.5      0.8      20.0      395

**LABORATORY ANALYTICAL REPORT AND CHAIN OF CUSTODY**

October 16, 2014

Apex Companies, LLC

David Puchrik

3240 W. 71st Avenue, Suite 1

Westminster CO 80030

Project Name - DCP CR-15 Remediation

Project Number - 420159.001

Attached are your analytical results for DCP CR-15 Remediation received by Origins Laboratory, Inc. October 09, 2014. This project is associated with Origins project number X410090-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

David Puchrik  
Project Number: 420159.001  
Project: DCP CR-15 Remediation

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-1 10'	X410090-01	Soil	October 9, 2014 9:55	10/09/2014 16:20
B-1 12'	X410090-02	Soil	October 9, 2014 10:00	10/09/2014 16:20
B-2 13'	X410090-03	Soil	October 9, 2014 10:25	10/09/2014 16:20
B-3 12'	X410090-04	Soil	October 9, 2014 10:45	10/09/2014 16:20
B-4 5'	X410090-05	Soil	October 9, 2014 11:05	10/09/2014 16:20
B-5 8'	X410090-06	Soil	October 9, 2014 11:35	10/09/2014 16:20
B-6 10'	X410090-07	Soil	October 9, 2014 11:50	10/09/2014 16:20
B-7 5'	X410090-08	Soil	October 9, 2014 12:00	10/09/2014 16:20
B-8 10'	X410090-09	Soil	October 9, 2014 12:15	10/09/2014 16:20
B-8 13'	X410090-10	Soil	October 9, 2014 12:20	10/09/2014 16:20

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

David Puchrik  
Project Number: 420159.001  
Project: DCP CR-15 Remediation

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

www.originslaboratory.com

X410090

**ORIGINS**  
 LABORATORY, INC

page 1 of 1

Client: Apex Companies  
 Address: 3240 W. 71st Ave. Suite 1  
 westminster CO 80030  
 Telephone Number: (303) 487-1020  
 Email Address: dpuchrik@apexcos.com

Project Manager: David Puchrik  
 Project Name: DCP CR-15 Remediation  
 Project Number: 420159.001  
 Samples Collected By: David Puchrik

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis			Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 12.5			
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa #	Other	Geo ID#	BTEX		Naphthalene		
B-1 10'	10/14/14	0955	1	X				X				X	X				
B-1 12'		1000															
B-2 13'		1025															
B-3 12'		1045															
B-4 5'		1105															
B-5 8'		1135															
B-6 10'		1150															
B-7 5'		1200															
B-8 10'		1215															
B-8 13'		1220															
Relinquished By: <i>[Signature]</i>	Date: 10/9/2014	Time: 1600															
Relinquished By: <i>[Signature]</i>	Date: 10/9/14	Time: 1600															

Date Results Needed

Origins Laboratory, Inc.

*Jefe Pellegrini*

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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X410090

Client: Apex

Client Project ID: DCP CR-15 Remediation

Checklist Completed by: Jeff Smith

Shipped Via: H/D  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 10/9/12

Airbill #: NA

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 1 / 2.8 °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C (Describe)

Thermometer ID: T002

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?		X		Sampled Some Dry
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		X		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>			X	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

  
 Reviewed by (Project Manager)

10-10-12  
 Date/Time Reviewed

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-1 10'**  
**10/9/2014 9:55:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410090-01 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	186	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
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Surrogate: <i>o</i> -Terphenyl	66.1 %	59-131			"	"	"	
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**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	904	50.0	mg/kg	250	4J10008	10/10/2014	10/10/2014	
Benzene	6.97	0.50	"	"	"	"	"	
Toluene	23.4	0.50	"	"	"	"	"	
Ethylbenzene	4.64	0.50	"	"	"	"	"	
Xylenes, total	29.3	0.50	"	"	"	"	"	
Napthalene	ND	2.00	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"	
Surrogate: Toluene-d8	119 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.6 %	70-130			"	"	"	

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-1 12'**  
**10/9/2014 10:00:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

**Origins Laboratory, Inc.**  
**X410090-02 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
Surrogate: <i>o</i> -Terphenyl	77.0 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.20	mg/kg	1	4J10008	10/10/2014	10/10/2014	
Benzene	<b>0.01</b>	0.002	"	"	"	"	"	
Toluene	<b>0.007</b>	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	<b>0.01</b>	0.002	"	"	"	"	"	
Napthalene	ND	0.008	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	70-130			"	"	"	
Surrogate: Toluene-d8	105 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	105 %	70-130			"	"	"	

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-2 13'**  
**10/9/2014 10:25:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410090-03 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
Surrogate: <i>o</i> -Terphenyl	81.6 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	171	20.0	mg/kg	100	4J10008	10/10/2014	10/10/2014	
Benzene	0.87	0.20	"	"	"	"	"	
Toluene	4.52	0.20	"	"	"	"	"	
Ethylbenzene	0.73	0.20	"	"	"	"	"	
Xylenes, total	4.76	0.20	"	"	"	"	"	
Napthalene	ND	0.80	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	106 %	70-130			"	"	"	
Surrogate: Toluene-d8	116 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	103 %	70-130			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-3 12'**  
**10/9/2014 10:45:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410090-04 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
Surrogate: <i>o</i> -Terphenyl	90.3 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	1.85	0.20	mg/kg	1	4J10008	10/10/2014	10/10/2014	
Benzene	0.21	0.002	"	"	"	"	"	
Toluene	0.11	0.002	"	"	"	"	"	
Ethylbenzene	0.02	0.002	"	"	"	"	"	
Xylenes, total	0.20	0.002	"	"	"	"	"	
Napthalene	ND	0.008	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	70-130			"	"	"	
Surrogate: Toluene-d8	112 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

B-4 5'

10/9/2014 11:05:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

**Origins Laboratory, Inc.**  
 X410090-05 (Soil)

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
<i>Surrogate: o-Terphenyl</i>	90.6 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	0.56	0.20	mg/kg	1	4J10008	10/10/2014	10/10/2014	
Benzene	0.10	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	0.002	0.002	"	"	"	"	"	
Xylenes, total	0.06	0.002	"	"	"	"	"	
Napthalene	ND	0.008	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	106 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	108 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-5 8'**

**10/9/2014 11:35:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410090-06 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
<i>Surrogate: o-Terphenyl</i>	87.9 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	<b>0.45</b>	0.20	mg/kg	1	4J10008	10/10/2014	10/10/2014	
Benzene	<b>0.07</b>	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	<b>0.002</b>	0.002	"	"	"	"	"	
Xylenes, total	<b>0.005</b>	0.002	"	"	"	"	"	
Napthalene	ND	0.008	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	103 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	108 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	100 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-6 10'**  
**10/9/2014 11:50:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410090-07 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
<i>Surrogate: o-Terphenyl</i>	73.1 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	<b>0.91</b>	0.20	mg/kg	1	4J10008	10/10/2014	10/10/2014	
Benzene	<b>0.18</b>	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	<b>0.01</b>	0.002	"	"	"	"	"	
Xylenes, total	<b>0.05</b>	0.002	"	"	"	"	"	
Napthalene	ND	0.008	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	103 %	70-130			"	"	"	
<i>Surrogate: Toluene-d8</i>	110 %	70-130			"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

B-7 5'

10/9/2014 12:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 X410090-08 (Soil)

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
Surrogate: <i>o</i> -Terphenyl	75.0 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.20	mg/kg	1	4J10008	10/10/2014	10/10/2014	
Benzene	0.005	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	
Napthalene	ND	0.008	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	
Surrogate: Toluene-d8	106 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-8 10'**  
**10/9/2014 12:15:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410090-09 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
Surrogate: <i>o</i> -Terphenyl	76.6 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	<b>128</b>	10.0	mg/kg	50	4J10008	10/10/2014	10/13/2014	
Benzene	<b>0.33</b>	0.10	"	"	"	"	"	
Toluene	<b>1.06</b>	0.10	"	"	"	"	"	
Ethylbenzene	<b>0.29</b>	0.10	"	"	"	"	"	
Xylenes, total	<b>2.05</b>	0.10	"	"	"	"	"	
Napthalene	ND	0.40	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	110 %	70-130			"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	99.4 %	70-130			"	"	"	

Origins Laboratory, Inc.



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 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**B-8 13'**

**10/9/2014 12:20:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X410090-10 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	4J10005	10/10/2014	10/14/2014	
Surrogate: <i>o</i> -Terphenyl	98.1 %	59-131			"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.20	mg/kg	1	4J10008	10/10/2014	10/10/2014	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	<b>0.002</b>	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	
Napthalene	ND	0.008	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	103 %	70-130			"	"	"	
Surrogate: Toluene-d8	104 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	97.8 %	70-130			"	"	"	

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 4J10008 - EPA 5030 (soil)**

**Blank (4J10008-BLK1)**

Prepared: 10/10/2014 Analyzed: 10/10/2014

Gasoline Range Hydrocarbons	ND	0.20	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Naphthalene	ND	0.008	"							
Surrogate: 1,2-Dichloroethane-d4	67		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	65		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 4J10008 - EPA 5030 (soil)**

**LCS (4J10008-BS1)**

Prepared: 10/10/2014 Analyzed: 10/10/2014

Benzene	0.10	0.002	mg/kg	0.100		95.1	70-130			
Toluene	0.10	0.002	"	0.100		104	70-130			
Ethylbenzene	0.10	0.002	"	0.100		95.2	70-130			
m,p-Xylene	0.19	0.004	"	0.200		96.3	70-130			
o-Xylene	0.10	0.002	"	0.100		95.5	70-130			
Naphthalene	0.09	0.008	"	0.100		92.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		98.0	70-130			
Surrogate: Toluene-d8	64		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4J10008 - EPA 5030 (soil)

Matrix Spike (4J10008-MS1)	Source: X410090-10			Prepared: 10/10/2014 Analyzed: 10/10/2014						
Benzene	0.10	0.002	mg/kg	0.100	0.0006	98.3	70-130			
Toluene	0.11	0.002	"	0.100	0.002	106	70-130			
Ethylbenzene	0.10	0.002	"	0.100	ND	98.0	70-130			
m,p-Xylene	0.20	0.004	"	0.200	0.001	97.1	70-130			
o-Xylene	0.10	0.002	"	0.100	0.0005	98.9	70-130			
Naphthalene	0.10	0.008	"	0.100	ND	100	70-130			
Surrogate: 1,2-Dichloroethane-d4	62		ug/kg	62.5		98.6	70-130			
Surrogate: Toluene-d8	64		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4J10008 - EPA 5030 (soil)

Matrix Spike Dup (4J10008-MSD1)	Source: X410090-10			Prepared: 10/10/2014 Analyzed: 10/10/2014						
Benzene	0.10	0.002	mg/kg	0.100	0.0006	99.3	70-130	1.01	20	
Toluene	0.11	0.002	"	0.100	0.002	106	70-130	0.203	20	
Ethylbenzene	0.10	0.002	"	0.100	ND	95.7	70-130	2.38	20	
m,p-Xylene	0.19	0.004	"	0.200	0.001	95.4	70-130	1.77	20	
o-Xylene	0.10	0.002	"	0.100	0.0005	96.0	70-130	2.98	20	
Naphthalene	0.11	0.008	"	0.100	ND	106	70-130	5.50	20	
Surrogate: 1,2-Dichloroethane-d4	63		ug/kg	62.5		100	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159.001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Extractable Petroleum Hydrocarbons by 8015M - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 4J10005 - EPA 3580**

**Blank (4J10005-BLK1)**

Prepared: 10/10/2014 Analyzed: 10/14/2014

Diesel (C10-C28)	ND	50.0	mg/kg							
Surrogate: o-Terphenyl	62		g	50.0		124	59-131			

**LCS (4J10005-BS1)**

Prepared: 10/10/2014 Analyzed: 10/14/2014

Diesel (C10-C28)	797	50.0	mg/kg	1000		79.7	64-121			
Surrogate: o-Terphenyl	41		g	50.0		82.9	59-131			

**LCS Dup (4J10005-BSD1)**

Prepared: 10/10/2014 Analyzed: 10/14/2014

Diesel (C10-C28)	858	50.0	mg/kg	1000		85.8	64-121	7.30	20	
Surrogate: o-Terphenyl	37		g	50.0		74.1	59-131			

Origins Laboratory, Inc.



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Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

David Puchrik  
Project Number: 420159.001  
Project: DCP CR-15 Remediation

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### Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

---

Jen Pellegrini For Noelle Doyle Mathis, President



September 15, 2015

Apex Companies, LLC

David Puchrik

3240 W. 71st Avenue, Suite 1

Westminster CO 80030

Project Name - DCP CR-15 Remediation

Project Number - 420159-001

Attached are your analytical results for DCP CR-15 Remediation received by Origins Laboratory, Inc. September 09, 2015. This project is associated with Origins project number X509114-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

David Puchrik  
Project Number: 420159-001  
Project: DCP CR-15 Remediation

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
CSB-1 (10')	X509114-01	Soil	September 9, 2015 10:40	09/09/2015 13:40
CSB-2 (10')	X509114-02	Soil	September 9, 2015 10:55	09/09/2015 13:40
CSB-3 (13')	X509114-03	Soil	September 9, 2015 11:10	09/09/2015 13:40
CSB-4 (10')	X509114-04	Soil	September 9, 2015 11:25	09/09/2015 13:40
CSB-5 (12')	X509114-05	Soil	September 9, 2015 11:40	09/09/2015 13:40

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: X509114

Client: Apex

Client Project ID: DCP CR-15 Remediation

Checklist Completed by: Jeff Smith

Shipped Via: 410  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 9/10/15

Airbill #: N/A

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_ (Describe)

Cooler Number/Temperature: 1 / 13.4 °C 1 °C 1 °C 1 °C

Thermometer ID: TOUB

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		Y		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		X		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	Y			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	Y			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc <sub>2</sub> +NaOH)			X	
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

JM  
 Reviewed by (Project Manager)

9/15/15  
 Date/Time Reviewed

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**CSB-1 (10')**  
**9/9/2015 10:40:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509114-01 (Soil)**

**BTEX by EPA 8260C**

Benzene	0.008	0.002	mg/kg	1	5111010	09/11/2015	09/11/2015	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	0.002	0.002	"	"	"	"	"	
Xylenes, total	0.015	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	108 %	70-130			"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	103 %	70-130			"	"	"	

**TPH-Carbon Chain by EPA Method 8015C**

Gasoline (C6-C10)	ND	50	mg/kg	1	5111011	09/11/2015	09/11/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	79.1 %	65-146			"	"	"	
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Origins Laboratory, Inc.



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 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**CSB-2 (10')**  
**9/9/2015 10:55:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509114-02 (Soil)**

**BTEX by EPA 8260C**

Benzene	ND	0.002	mg/kg	1	5111010	09/11/2015	09/11/2015	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	113 %	70-130			"	"	"	
Surrogate: Toluene-d8	97.2 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"	

**TPH-Carbon Chain by EPA Method 8015C**

Gasoline (C6-C10)	ND	50	mg/kg	1	5111011	09/11/2015	09/11/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	84.4 %	65-146			"	"	"	
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Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**CSB-3 (13')**  
**9/9/2015 11:10:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509114-03 (Soil)**

**BTEX by EPA 8260C**

Benzene	ND	0.002	mg/kg	1	5111010	09/11/2015	09/11/2015	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	<b>0.002</b>	0.002	"	"	"	"	"	
Xylenes, total	<b>0.006</b>	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	111 %	70-130			"	"	"	
Surrogate: Toluene-d8	101 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"	

**TPH-Carbon Chain by EPA Method 8015C**

Gasoline (C6-C10)	ND	50	mg/kg	1	5111011	09/11/2015	09/11/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	81.6 %	65-146			"	"	"	
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Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**CSB-4 (10')**  
**9/9/2015 11:25:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509114-04 (Soil)**

**BTEX by EPA 8260C**

Benzene	ND	0.002	mg/kg	1	5111010	09/11/2015	09/11/2015	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	110 %	70-130			"	"	"	
Surrogate: Toluene-d8	97.6 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	104 %	70-130			"	"	"	

**TPH-Carbon Chain by EPA Method 8015C**

Gasoline (C6-C10)	ND	50	mg/kg	1	5111011	09/11/2015	09/11/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	68.0 %	65-146			"	"	"	
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Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**CSB-5 (12')**  
**9/9/2015 11:40:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X509114-05 (Soil)**

**BTEX by EPA 8260C**

Benzene	ND	0.002	mg/kg	1	5111010	09/11/2015	09/11/2015	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	111 %	70-130			"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	

**TPH-Carbon Chain by EPA Method 8015C**

Gasoline (C6-C10)	ND	50	mg/kg	1	5111011	09/11/2015	09/11/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	82.3 %	65-146			"	"	"	
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Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 5111010 - EPA 5030 (soil)**

**Blank (5111010-BLK1)**

Prepared: 09/11/2015 Analyzed: 09/11/2015

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	64		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.6	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.2	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 5111010 - EPA 5030 (soil)**

**LCS (5111010-BS1)**

Prepared: 09/11/2015 Analyzed: 09/11/2015

Benzene	0.097	0.002	mg/kg	0.100		97.0	77.1-124			
Toluene	0.094	0.002	"	0.100		94.1	74.5-128			
Ethylbenzene	0.100	0.002	"	0.100		99.6	66.4-127			
m,p-Xylene	0.201	0.004	"	0.200		101	76.6-124			
o-Xylene	0.097	0.002	"	0.100		97.4	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	63		ug/kg	62.5		100	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.4	70-130			

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5111010 - EPA 5030 (soil)

Matrix Spike (5111010-MS1)	Source: X509114-01			Prepared: 09/11/2015 Analyzed: 09/11/2015						
Benzene	0.108	0.002	mg/kg	0.100	0.008	99.4	71.8-126			
Toluene	0.106	0.002	"	0.100	ND	106	65.1-130			
Ethylbenzene	0.103	0.002	"	0.100	0.002	101	62.2-130			
m,p-Xylene	0.206	0.004	"	0.200	ND	103	46.5-137			
o-Xylene	0.109	0.002	"	0.100	0.015	93.7	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	71		ug/kg	62.5		113	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5111010 - EPA 5030 (soil)

Matrix Spike Dup (5111010-MSD1)	Source: X509114-01			Prepared: 09/11/2015 Analyzed: 09/11/2015						
Benzene	0.122	0.002	mg/kg	0.100	0.008	114	71.8-126	12.4	11.3	QM-07, QR-02
Toluene	0.111	0.002	"	0.100	ND	111	65.1-130	4.63	15.4	
Ethylbenzene	0.117	0.002	"	0.100	0.002	114	62.2-130	12.4	19.6	
m,p-Xylene	0.226	0.004	"	0.200	ND	113	46.5-137	9.11	19.2	
o-Xylene	0.126	0.002	"	0.100	0.015	110	54.2-134	14.2	17.9	
Surrogate: 1,2-Dichloroethane-d4	71		ug/kg	62.5		113	70-130			
Surrogate: Toluene-d8	59		"	62.5		95.1	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Apex Companies, LLC  
 3240 W. 71st Avenue, Suite 1  
 Westminster CO 80030

David Puchrik  
 Project Number: 420159-001  
 Project: DCP CR-15 Remediation

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Extractable Petroleum Hydrocarbons by 8015C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 5111011 - EPA 3580**

**Blank (5111011-BLK1)**

Prepared: 09/11/2015 Analyzed: 09/11/2015

Gasoline (C6-C10)	ND	50	mg/kg							
Diesel (C10-C28)	ND	50	"							
Residual Range Organics (C28-C36)	ND	200	"							

Surrogate: o-Terphenyl

54.7

"

50.0

109

65-146

**LCS (5111011-BS1)**

Prepared: 09/11/2015 Analyzed: 09/11/2015

Gasoline (C6-C10)	760	50	mg/kg				66.7-119			
Diesel (C10-C28)	820	50	"	1000	81.9		70.1-127			
Residual Range Organics (C28-C36)	820	200	"	1000	82.0		54.5-139			

Surrogate: o-Terphenyl

43.8

"

50.0

87.5

65-146

**Matrix Spike (5111011-MS1)**

Source: X509114-01

Prepared: 09/11/2015 Analyzed: 09/11/2015

Gasoline (C6-C10)	910	50	mg/kg		28		56.4-132			
Diesel (C10-C28)	1000	50	"	1000	ND	101	57.4-138			
Residual Range Organics (C28-C36)	1100	200	"	1000	16	106	47.7-129			

Surrogate: o-Terphenyl

49.8

"

50.0

99.7

65-146

**Matrix Spike Dup (5111011-MSD1)**

Source: X509114-01

Prepared: 09/11/2015 Analyzed: 09/11/2015

Gasoline (C6-C10)	850	50	mg/kg		28		56.4-132	7.33	22	
Diesel (C10-C28)	960	50	"	1000	ND	95.9	57.4-138	5.21	18.3	
Residual Range Organics (C28-C36)	1000	200	"	1000	16	100	47.7-129	5.93	30.1	

Surrogate: o-Terphenyl

43.8

"

50.0

87.6

65-146

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC  
3240 W. 71st Avenue, Suite 1  
Westminster CO 80030

David Puchrik  
Project Number: 420159-001  
Project: DCP CR-15 Remediation

---

### Notes and Definitions

- QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 03, 2014

Jim Dawe  
Tasman Geosciences  
6899 Pecos Street  
Denver, CO 80221  
RE: CR56&CR15

Enclosed are the results of analyses for samples received by Summit Scientific on 06/25/14 18:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'BS', with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury  
President / Laboratory Manager



Tasman Geosciences  
6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

**Reported:**  
07/03/14 15:31

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS04@4'	1406189-01	Soil	06/24/14 14:30	06/25/14 18:00
SS09@1'	1406189-02	Soil	06/24/14 16:50	06/25/14 18:00
SS11@9'	1406189-03	Soil	06/24/14 18:00	06/25/14 18:00
SS07@12'	1406189-04	Soil	06/25/14 09:20	06/25/14 18:00
SS12@5'	1406189-05	Soil	06/25/14 09:30	06/25/14 18:00
SS10@3'	1406189-06	Soil	06/24/14 17:19	06/25/14 18:00

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



Tasman Geosciences  
6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

1406/89  
Summit Scientific

741 Corporate Circle, Suite 168 • Golden, Colorado 80401  
303-277-9310 • 303-374-9933

Client: DCP/Tasman Project Manager: Jim Dawe Page 1 of 1  
Address: \_\_\_\_\_ E-Mail: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Project Name: CR56&CR15  
Sampler Name: Box MA14004 Project Number: \_\_\_\_\_

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative			Matrix			Analysis Requested	Special Instructions	
					HCl	HNO3	None	Other (Specify)	Groundwater	Soil			Air-Canister #
1	550104	6/24/14	1430	1		X		X					
2	550101	6/24/14	1650	1		X		X					
3	551109	6/24/14	1900	1		X		X					
4	550702	6/25/14	0920	1		X		X					
5	551205	6/25/14	0130	1		X		X					
6	551003	6/24/14	1719	1		X		X					
7													
8													
9													
10													

Relinquished by: <u>MA</u>	Date/Time: <u>6/25/14 1600</u>	Received by: <u>[Signature]</u>	Date/Time: <u>6/25/14 18:00</u>	Turn Around Time (Check):	Notes:
Relinquished by:	Date/Time:	Received by:	Date/Time:	72 hours <input type="checkbox"/>	Standard <input checked="" type="checkbox"/>
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 hours <input type="checkbox"/>	
Relinquished by:	Date/Time:	Received by:	Date/Time:	48 hours <input type="checkbox"/>	Sample Integrity: <u>55</u>
Relinquished by:	Date/Time:	Received by:	Date/Time:	Temperature Upon Receipt: <u>55</u>	Intact: <input checked="" type="checkbox"/>

www.s2scientific.com



Tasman Geosciences  
6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**SS04@4'**  
**1406189-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **06/24/14 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>92</b>	50	mg/kg	1	1406214	06/26/14	06/27/14	8015M	

Date Sampled: **06/24/14 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		111 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **06/24/14 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>0.21</b>	0.10	mg/kg	10	1406215	06/26/14	06/28/14	EPA 8260B	
<b>Benzene</b>	<b>0.19</b>	0.020	"	"	"	"	"	"	
<b>Toluene</b>	<b>0.76</b>	0.050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.24</b>	0.050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>1.8</b>	0.10	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>37</b>	5.0	"	"	"	"	"	"	

Date Sampled: **06/24/14 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		86.1 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.8 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.5 %	21-167		"	"	"	"	

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



Tasman Geosciences  
6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**SS09@1'**  
**1406189-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **06/24/14 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1406214	06/26/14	06/27/14	8015M	

Date Sampled: **06/24/14 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		106 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **06/24/14 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1406215	06/26/14	06/28/14	EPA 8260B	
<b>Benzene</b>	<b>0.0073</b>	0.0020	"	"	"	"	"	"	
<b>Toluene</b>	<b>0.013</b>	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.014</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/24/14 16:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.3 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences  
6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

**Reported:**  
07/03/14 15:31

**SS11@9'**  
**1406189-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **06/24/14 18:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>720</b>	50	mg/kg	1	1406214	06/26/14	07/02/14	8015M	

Date Sampled: **06/24/14 18:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		98.9 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **06/24/14 18:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>4.0</b>	0.20	mg/kg	100	1407018	07/02/14	07/03/14	EPA 8260B	
<b>Toluene</b>	<b>20</b>	0.50	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>6.0</b>	0.50	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>40</b>	0.50	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1300</b>	50	"	"	"	"	"	"	

Date Sampled: **06/24/14 18:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		102 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		114 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		106 %	21-167		"	"	"	"	

Date Sampled: **06/24/14 18:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>1.9</b>	1.0	"	100	1406215	06/26/14	06/28/14	"	
<b>Benzene</b>	<b>5.0</b>	0.20	"	"	"	"	"	"	
<b>Toluene</b>	<b>25</b>	0.50	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>6.5</b>	0.50	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>42</b>	1.0	"	"	"	"	"	"	

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Tasman Geosciences  
 6899 Pecos Street  
 Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
 Project Manager: Jim Dawe

**Reported:**  
 07/03/14 15:31

**SS11@9'**  
**1406189-03 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

**Gasoline Range Hydrocarbons**                      **1300**                      50 mg/kg                      100                      1406215                      06/26/14                      06/28/14                      EPA 8260B

Date Sampled: **06/24/14 18:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		85.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	21-167		"	"	"	"	

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6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**SS07@12'**  
**1406189-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **06/25/14 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1406214	06/26/14	06/27/14	8015M	

Date Sampled: **06/25/14 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		111 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **06/25/14 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1406215	06/26/14	06/27/14	EPA 8260B	
<b>Benzene</b>	<b>0.027</b>	0.0020	"	"	"	"	"	"	
<b>Toluene</b>	<b>0.057</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.015</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.10</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1.7</b>	0.50	"	"	"	"	"	"	

Date Sampled: **06/25/14 09:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.8 %	21-167		"	"	"	"	

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6899 Pecos Street  
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Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**SS12@5'**  
**1406189-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **06/25/14 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1406214	06/26/14	06/27/14	8015M	

Date Sampled: **06/25/14 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		106 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **06/25/14 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1406215	06/26/14	06/27/14	EPA 8260B	
<b>Benzene</b>	<b>0.24</b>	0.0020	"	"	"	"	"	"	
<b>Toluene</b>	<b>0.22</b>	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.018</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.12</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1.6</b>	0.50	"	"	"	"	"	"	

Date Sampled: **06/25/14 09:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.2 %	21-167		"	"	"	"	

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Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**SS10@3'**  
**1406189-06 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **06/24/14 17:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1406214	06/26/14	06/27/14	8015M	

Date Sampled: **06/24/14 17:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		112 %	30-150		"	"	"	"	

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **06/24/14 17:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1406215	06/26/14	06/27/14	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.011</b>	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **06/24/14 17:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		89.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.6 %	21-167		"	"	"	"	

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6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

**Reported:**  
07/03/14 15:31

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**Batch 1406214 - EPA 3550A**

**Blank (1406214-BLK1)**

Prepared: 06/26/14 Analyzed: 06/27/14

C10-C28 (DRO) ND 50 mg/kg

**LCS (1406214-BS1)**

Prepared: 06/26/14 Analyzed: 06/27/14

C10-C28 (DRO) 530 50 mg/kg 501 106 73-134

**Matrix Spike (1406214-MS1)**

**Source: 1406189-01**

Prepared: 06/26/14 Analyzed: 06/27/14

C10-C28 (DRO) 563 50 mg/kg 455 92.0 103 50-148

**Matrix Spike Dup (1406214-MSD1)**

**Source: 1406189-01**

Prepared: 06/26/14 Analyzed: 06/27/14

C10-C28 (DRO) 558 50 mg/kg 455 92.0 102 50-148 0.889 13

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6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**Batch 1406215 - EPA 5030 Soil MS**

**Blank (1406215-BLK1)**

Prepared: 06/26/14 Analyzed: 06/27/14

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0313</i>		<i>"</i>	<i>0.0353</i>		<i>88.8</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0351</i>		<i>"</i>	<i>0.0355</i>		<i>98.8</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0345</i>		<i>"</i>	<i>0.0355</i>		<i>97.2</i>	<i>21-167</i>			

**LCS (1406215-BS1)**

Prepared: 06/26/14 Analyzed: 06/27/14

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0980	0.0020	"	0.0954		103	58-130			
Toluene	0.104	0.0050	"	0.0954		109	61-134			
Ethylbenzene	0.108	0.0050	"	0.0947		114	74-139			
m,p-Xylene	0.216	0.010	"	0.190		114	73-137			
o-Xylene	0.104	0.0050	"	0.0939		111	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0336</i>		<i>"</i>	<i>0.0379</i>		<i>88.6</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0383</i>		<i>"</i>	<i>0.0382</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0364</i>		<i>"</i>	<i>0.0382</i>		<i>95.5</i>	<i>21-167</i>			

**Matrix Spike (1406215-MS1)**

Source: 1406189-01

Prepared: 06/26/14 Analyzed: 06/27/14

Naphthalene	0.0902	0.010	mg/kg		0.214		10-158			
Benzene	0.384	0.0020	"	0.0899	0.194	211	30-131			QM-4X
Toluene	0.705	0.0050	"	0.0899	0.761	NR	30-134			QM-4X
Ethylbenzene	0.183	0.0050	"	0.0892	0.240	NR	22-153			QM-4X
m,p-Xylene	0.664	0.010	"	0.179	1.26	NR	10-159			QM-4X
o-Xylene	0.333	0.0050	"	0.0885	0.571	NR	31-151			QM-4X
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0323</i>		<i>"</i>	<i>0.0357</i>		<i>90.4</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0349</i>		<i>"</i>	<i>0.0360</i>		<i>96.9</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0384</i>		<i>"</i>	<i>0.0360</i>		<i>107</i>	<i>21-167</i>			

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Tasman Geosciences  
6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**Batch 1406215 - EPA 5030 Soil MS**

**Matrix Spike Dup (1406215-MSD1)**

Source: 1406189-01

Prepared: 06/26/14

Analyzed: 06/27/14

Naphthalene	0.106	0.010	mg/kg		0.214		10-158	16.4	42	
Benzene	0.443	0.0020	"	0.0947	0.194	264	30-131	14.5	34	QM-4X
Toluene	0.843	0.0050	"	0.0947	0.761	85.9	30-134	17.8	30	QM-4X
Ethylbenzene	0.184	0.0050	"	0.0939	0.240	NR	22-153	0.438	24	QM-4X
m,p-Xylene	0.738	0.010	"	0.189	1.26	NR	10-159	10.6	68	QM-4X
o-Xylene	0.367	0.0050	"	0.0932	0.571	NR	31-151	9.61	38	QM-4X
Surrogate: 1,2-Dichloroethane-d4	0.0334		"	0.0376		88.9	23-173			
Surrogate: Toluene-d8	0.0362		"	0.0379		95.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0379		108	21-167			

**Batch 1407018 - EPA 5030 Soil MS**

**Blank (1407018-BLK1)**

Prepared & Analyzed: 07/02/14

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0408		"	0.0397		103	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0404		"	0.0400		101	21-167			

**LCS (1407018-BS1)**

Prepared & Analyzed: 07/02/14

Benzene	0.116	0.0020	mg/kg	0.100		116	58-130			
Toluene	0.122	0.0050	"	0.100		122	61-134			
Ethylbenzene	0.127	0.0050	"	0.0992		128	74-139			
m,p-Xylene	0.247	0.010	"	0.200		124	73-137			
o-Xylene	0.120	0.0050	"	0.0984		122	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0394		"	0.0397		99.3	23-173			
Surrogate: Toluene-d8	0.0405		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		98.6	21-167			

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6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

Reported:  
07/03/14 15:31

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**Batch 1407018 - EPA 5030 Soil MS**

<b>Matrix Spike (1407018-MS1)</b>	<b>Source: 1407016-01</b>			<b>Prepared &amp; Analyzed: 07/02/14</b>						
Benzene	0.303	0.0020	mg/kg	0.0977	0.203	103	30-131			
Toluene	2930000	0.0050	"	0.0977	7.59	NR	30-134			
Ethylbenzene	2930000	0.0050	"	0.0969	1.60	NR	22-153			
m,p-Xylene	2930000	0.010	"	0.195	29200000	NR	10-159			
o-Xylene	2930000	0.0050	"	0.0961	5.60	NR	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0323		"	0.0388		83.3	23-173			
Surrogate: Toluene-d8	0.0736		"	0.0391		188	20-170			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0391		103	21-167			

<b>Matrix Spike Dup (1407018-MSD1)</b>	<b>Source: 1407016-01</b>			<b>Prepared &amp; Analyzed: 07/02/14</b>						
Benzene	0.236	0.0020	mg/kg	0.0958	0.203	34.8	30-131	24.8	34	
Toluene	2870000	0.0050	"	0.0958	7.59	NR	30-134	1.93	30	
Ethylbenzene	2870000	0.0050	"	0.0950	1.60	NR	22-153	1.93	24	
m,p-Xylene	2870000	0.010	"	0.191	29200000	NR	10-159	1.93	68	
o-Xylene	2870000	0.0050	"	0.0943	5.60	NR	31-151	1.93	38	
Surrogate: 1,2-Dichloroethane-d4	0.0385		"	0.0380		101	23-173			
Surrogate: Toluene-d8	0.0675		"	0.0383		176	20-170			
Surrogate: 4-Bromofluorobenzene	0.0641		"	0.0383		167	21-167			

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6899 Pecos Street  
Denver CO, 80221

Project: CR56&CR15

Project Number: [none]  
Project Manager: Jim Dawe

**Reported:**  
07/03/14 15:31

### Notes and Definitions

- QM-4X The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference