

**State of Colorado**  
**Oil and Gas Conservation Commission**

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



FOR OGCC USE ONLY  
Document 2143187  
Received 2/26/2014

**SPILL/RELEASE REPORT**

This form is to be submitted by the party responsible for the oil and gas spill or release. Any spill or release which may impact waters of the State must be reported as soon as practicable; any spill over 20 bbls must be reported within 24 hours and all spills over five bbls must be reported within ten days. Submit a Site Investigation and Remediation Workplan (Form 27) when requested by the Director.

Spill report taken by:

FACILITY ID:

**OPERATOR INFORMATION**

Name of Operator: <u>PDC Energy, Inc.</u> OGCC Operator No: <u>69175</u>	Phone Numbers
Address: <u>1775 Sherman Street, Suite 3000</u>	No: <u>(303) 831-3971</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80203</u>	Fax: <u>(303) 860-5838</u>
Contact Person: <u>Brandon Bruns</u>	Email: <u>brandon.bruns@pdce.com</u>

**DESCRIPTION OF SPILL OR RELEASE**

Date of Incident: <u>10/21/2013</u> Facility Name & No: <u>Heinze Herber BU #1 &amp; 33-20</u>	County: <u>Weld</u>
Type of Facility (well, tank battery, flow line, pit): <u>Tank Battery</u>	QtrQtr: <u>SESE</u> Section: <u>20</u>
Well Name and Number: <u>Heinze Herber BU #1 &amp; 33-20</u>	Township: <u>1N</u> Range: <u>67W</u>
API Number: <u>05-123-10625</u>	Meridian: <u>6th</u>
Specify volume spilled and recovered (in bbls) for the following materials:	
Oil spilled: <u>0</u> Oil recov'd: <u>0</u> Water spilled: <u>0</u> Water recov'd: <u>0</u> Other spilled: <u>0</u> Other recov'd: <u>0</u>	
Ground Water impacted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Surface Water impacted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Contained within berm? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Area and vertical extent of spill: <u>~1,560 ft<sup>2</sup></u> x <u>~13' bgs</u>
Current land use: <u>Oil &amp; Gas Production Facility/Agriculture</u> Weather conditions: <u>Clear, 50s</u>	
Soil/geology description: <u>Wiley-Colby complex, 3 to 5 percent slopes</u>	
IF LESS THAN A MILE, report distance IN FEET to nearest ... Surface water: <u>~750' NW</u> Wetlands: <u>NA</u> Buildings: <u>~800' S</u>	
Livestock: <u>NA</u> Water wells: <u>~750' SE</u> Depth to shallowest ground water: <u>NA</u>	
Cause of spill (e.g. equipment failure, human error, etc.): <u>Equipment failure</u> Detailed description of the spill/release incident:	
On October 21, 2013, a historical release was discovered during the removal of a buried produced water vault at the Heinze Herber BU #1 & 33-20 tank battery. Wells Heinze-Herber B Unit 1 (API # 05-123-10625) and Heinze Herber 33-20 (API # 05-123-19804) produce to this tank battery. A topographic map of the site is included as Figure 1.	

**CORRECTIVE ACTION**

Describe immediate response (how stopped, contained and recovered):  
Excavation of impacted soil began on October 21, 2013 and concluded on October 30, 2013. Approximately 1,110 cubic yards (yd3) of impacted material was removed and transported to the Front Range Landfill Facility in Erie, Colorado under PDC waste manifests. Groundwater was not encountered during excavation activities. The location and extent of the excavation is illustrated on Figure 2.

Describe any emergency pits constructed: NA

How was the extent of contamination determined?  
On October 21, 2013, excavation of impacted soil began following the discovery a historical release below the buried concrete produced water vault. The vertical and lateral extents of the excavation were determined in the field using a photoionization detector (PID) to measure volatile organic compound (VOC) concentrations in soil. Between October 23, 2013 and October 30, 2013, eleven soil samples (SS01 through SS11) were collected from the walls and base of the excavation, as illustrated on Figure 2. Soil samples were submitted to Summit Scientific Laboratories in Golden, Colorado for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons (TPH) - gasoline range organics (GRO), and naphthalene by EPA Method 8260B and TPH - diesel range organics (DRO) by EPA Method 8015. Constituent concentrations were below COGCC Table 910-1 soil standards at all sample locations indicating petroleum hydrocarbon impacts were successfully mitigated during excavation activities. Soil analytical results are summarized in Table 1 and the laboratory analytical reports are included as Attachment A. Groundwater was not encountered during excavation activities. The extent of the excavation and soil sample locations are illustrated on Figure 2.

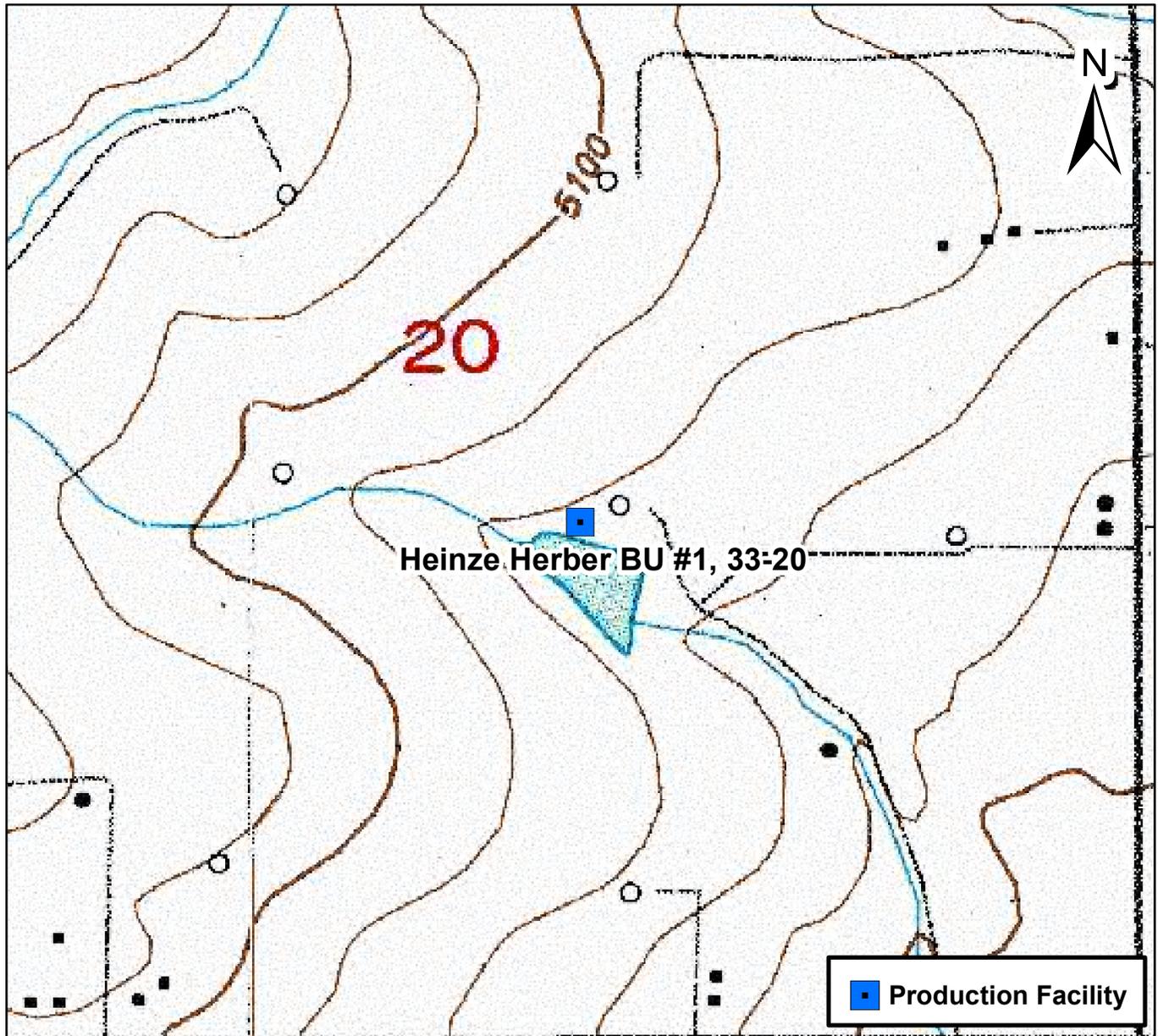
Further remediation activities proposed (attach separate sheet if needed):  
Based on the soil analytical data described herein, PDC is requesting No Further Action determination from the COGCC.

Describe measures taken to prevent problem from reoccurring:  
PDC will continue yearly production line and equipment testing once the location is back to being operational.

**OTHER NOTIFICATIONS**

List the parties and agencies notified (County, BLM, EPA, DOT, Local Emergency Planning Coordinator or other).

Date	Agency	Contact	Phone	Response
10/25/2013	Landowner			Letter sent to owner's address, no phone number found



### Figure 1

Site Location Map  
 Heinze Herber BU #1, 33-20  
 SESE S20 T1N R67W  
 Weld County, Colorado

Drawn By: DBA  
 Date: 11/19/2013





Pasture



52'

30'

M

SS10 @ 9' bgs

X SS06 @ 9' bgs

X  
SS03 @ 7' bgs

X  
SS07 @ 9' bgs

SS05 @ 10' bgs

X

210 bbl  
Oil Tank

100 PW Tank

X  
SS02 @ 8' bgs

X  
SS01 @ 13' bgs

X  
SS11 @ 9' bgs

SS04 @ 8' bgs

X

Test Pit  
X

SS08 @ 9' bgs

DCP Flowline

Battery Access Road

Pasture

Note: Surface drainage is estimated based on site topography and is not related to regional topography.

**Facility Diagram**

PDC Energy – DJ Basin  
Heinze Herber BU #1 & 33-20  
SE S20 T1N 67W  
Weld County, CO



6899 Pecos Street  
Unit C  
Denver, CO 80221

**LEGEND**

- Former Tank Location
- Earthen Berm
- Approximate Area of Excavation
- Soil Sample Location
- Underground Piping

M Meter House

**FIGURE 2**  
**EXCAVATION**  
**SITE MAP**  
Not to Scale

DRAWN BY: ESS

DATE: 11/1/2013

**TABLE 1**  
**HEINZE HERBER BU #1 AND 33-20**  
**SOIL ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (Feet bgs)	PID Readings (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH <sup>(2)</sup> (mg/kg)
SS01	10/23/2013	13	46.0	<0.002	<0.005	<0.005	<0.01	<0.01	<50
SS02	10/23/2013	8	0.0	<0.002	<0.005	<0.005	<0.01	<0.01	<50
SS03	10/24/2013	7	44.0	<0.002	<0.005	0.0066	0.013	<0.01	0.67
SS04	10/24/2013	8	10.4	<0.002	<0.005	<0.005	<0.01	<0.01	<50
SS05	10/29/2013	10	490	<0.002	<0.005	<0.005	<0.01	<0.01	1.4
SS06	10/29/2013	9	67.5	<0.002	<0.005	<0.005	<0.01	<0.01	0.71
SS07	10/29/2013	9	171	<0.002	<0.005	<0.005	<0.01	<0.01	<50
SS08	10/29/2013	9	13.6	<0.002	<0.005	<0.005	<0.01	<0.01	<50
SS10	10/30/2013	9	327	<0.002	<0.005	0.0056	<0.01	<0.01	2.5
SS11	10/30/2013	9	2,052	0.0021	<0.005	0.016	<0.01	<0.01	76.2
<b>COGCC standards for Soil (mg/kg) <sup>(1)</sup></b>				<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>

Notes:

1). Standards for Soil are taken from 2 CCR 404-1, Table 910-1, effective April 1, 2009.

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

GRO - Gasoline range organics.

DRO - Diesel range organics.

mg/kg= Milligrams per kilogram.

bgs - Below ground surface.

ppm - Parts per million

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

**ATTACHMENT A**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 24, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Heinze-Herber BU#1; 33-20

Enclosed are the results of analyses for samples received by Summit Scientific on 10/23/13 16:30. 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



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/24/13 17:11

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@13'	R310214-01	Soil	10/23/13 11:00	10/23/13 16:30
SS02@8'	R310214-02	Soil	10/23/13 13:00	10/23/13 16:30

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/24/13 17:11

**SS01@13'**  
**R310214-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/23/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102310	10/23/13	10/23/13	8015M	

Date Sampled: **10/23/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		118 %	30-150		"	"	"	"	

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

Date Sampled: **10/23/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102309	10/23/13	10/23/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/23/13 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/24/13 17:11

**SS02@8'**  
**R310214-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/23/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102310	10/23/13	10/23/13	8015M	

Date Sampled: **10/23/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		104 %	30-150		"	"	"	"	

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

Date Sampled: **10/23/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102309	10/23/13	10/23/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/23/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.1 %	21-167		"	"	"	"	

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PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/24/13 17:11

**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 3102310 - EPA 3550A**

<b>Blank (3102310-BLK1)</b>				Prepared & Analyzed: 10/23/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>LCS (3102310-BS1)</b>				Prepared & Analyzed: 10/23/13						
C10-C28 (DRO)	564	50	mg/kg	501		113	73-134			
<b>LCS Dup (3102310-BSD1)</b>				Prepared & Analyzed: 10/23/13						
C10-C28 (DRO)	561	50	mg/kg	501		112	73-134	0.628	11	
<b>Matrix Spike (3102310-MS1)</b>				Source: R310214-01 Prepared & Analyzed: 10/23/13						
C10-C28 (DRO)	519	50	mg/kg	474	ND	110	50-148			
<b>Matrix Spike Dup (3102310-MSD1)</b>				Source: R310214-01 Prepared: 10/23/13 Analyzed: 10/24/13						
C10-C28 (DRO)	513	50	mg/kg	470	ND	109	50-148	1.17	13	

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/24/13 17:11

**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 3102309 - EPA 5030 Soil MS**

**Blank (3102309-BLK1)**

Prepared & Analyzed: 10/23/13

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>0.0430</i>		<i>"</i>	<i>0.0397</i>		<i>108</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0379</i>		<i>"</i>	<i>0.0400</i>		<i>94.7</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0413</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

**LCS (3102309-BS1)**

Prepared & Analyzed: 10/23/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0824	0.0020	"	0.100		82.4	58-130			
Toluene	0.0942	0.0050	"	0.100		94.2	61-134			
Ethylbenzene	0.116	0.0050	"	0.100		116	74-139			
m,p-Xylene	0.220	0.010	"	0.200		110	73-137			
o-Xylene	0.116	0.0050	"	0.100		116	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0423</i>		<i>"</i>	<i>0.0397</i>		<i>106</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0379</i>		<i>"</i>	<i>0.0400</i>		<i>94.6</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0395</i>		<i>"</i>	<i>0.0400</i>		<i>98.8</i>	<i>21-167</i>			

**LCS Dup (3102309-BSD1)**

Prepared & Analyzed: 10/23/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0830	0.0020	"	0.100		83.0	58-130	0.798	13	
Toluene	0.0948	0.0050	"	0.100		94.8	61-134	0.635	16	
Ethylbenzene	0.118	0.0050	"	0.100		118	74-139	1.69	12	
m,p-Xylene	0.225	0.010	"	0.200		112	73-137	2.22	14	
o-Xylene	0.118	0.0050	"	0.100		118	73-141	1.59	12	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0418</i>		<i>"</i>	<i>0.0397</i>		<i>105</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0383</i>		<i>"</i>	<i>0.0400</i>		<i>95.8</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.4</i>	<i>21-167</i>			

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/24/13 17:11

**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 3102309 - EPA 5030 Soil MS**

**Matrix Spike (3102309-MS1)**

Source: R310214-01

Prepared & Analyzed: 10/23/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0824	0.0020	"	0.0996	ND	82.7	30-131			
Toluene	0.0962	0.0050	"	0.0996	ND	96.6	30-134			
Ethylbenzene	0.116	0.0050	"	0.0996	ND	116	22-153			
m,p-Xylene	0.222	0.010	"	0.199	ND	111	10-159			
o-Xylene	0.116	0.0050	"	0.0996	ND	117	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0435		"	0.0395		110	23-173			
Surrogate: Toluene-d8	0.0383		"	0.0398		96.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0398		101	21-167			

**Matrix Spike Dup (3102309-MSD1)**

Source: R310214-01

Prepared: 10/23/13 Analyzed: 10/24/13

Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0786	0.0020	"	0.0940	ND	83.6	30-131	4.76	34	
Toluene	0.0903	0.0050	"	0.0940	ND	96.0	30-134	6.36	30	
Ethylbenzene	0.108	0.0050	"	0.0940	ND	115	22-153	6.55	24	
m,p-Xylene	0.210	0.010	"	0.188	ND	112	10-159	5.40	68	
o-Xylene	0.111	0.0050	"	0.0940	ND	118	31-151	5.16	38	
Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0373		111	23-173			
Surrogate: Toluene-d8	0.0358		"	0.0376		95.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0373		"	0.0376		99.3	21-167			

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/24/13 17:11

### Notes and Definitions

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

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 27, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Heinze-Herber BU#1; 33-20

Enclosed are the results of analyses for samples received by Summit Scientific on 10/24/13 16:45. 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



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/27/13 18:16

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS03@7'	R310233-01	Soil	10/24/13 09:50	10/24/13 16:45
SS04@8'	R310233-02	Soil	10/24/13 11:30	10/24/13 16:45

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/27/13 18:16

**SS03@7'**  
**R310233-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/24/13 09:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102404	10/24/13	10/24/13	8015M	

Date Sampled: **10/24/13 09:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		90.6 %	30-150		"	"	"	"	

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

Date Sampled: **10/24/13 09:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102403	10/24/13	10/24/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0066</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.013</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>0.67</b>	0.50	"	"	"	"	"	"	

Date Sampled: **10/24/13 09:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.7 %	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.



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/27/13 18:16

**SS04@8'**  
**R310233-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/24/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102404	10/24/13	10/24/13	8015M	

Date Sampled: **10/24/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		88.7 %	30-150		"	"	"	"	

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

Date Sampled: **10/24/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102403	10/24/13	10/24/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/24/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.5 %	21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/27/13 18:16

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

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

**Batch 3102404 - EPA 3550A**

<b>Blank (3102404-BLK1)</b>				Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	ND	50	mg/kg								
<b>LCS (3102404-BS1)</b>				Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	464	50	mg/kg	501	92.6	73-134					
<b>LCS (3102404-BS2)</b>				Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	474	50	mg/kg	501	94.7	73-134					
<b>LCS Dup (3102404-BSD1)</b>				Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	472	50	mg/kg	501	94.2	73-134	1.69		11		
<b>LCS Dup (3102404-BSD2)</b>				Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	474	50	mg/kg	501	94.7	73-134	0.00654		11		
<b>Matrix Spike (3102404-MS1)</b>			<b>Source: R310231-01</b>	Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	477	50	mg/kg	501	ND	95.3	50-148				
<b>Matrix Spike (3102404-MS2)</b>			<b>Source: R310231-02</b>	Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	504	50	mg/kg	490	ND	103	50-148				
<b>Matrix Spike Dup (3102404-MSD1)</b>			<b>Source: R310231-01</b>	Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	483	50	mg/kg	495	ND	97.5	50-148	1.12		13	
<b>Matrix Spike Dup (3102404-MSD2)</b>			<b>Source: R310231-02</b>	Prepared: 10/24/13 Analyzed: 10/25/13							
C10-C28 (DRO)	474	50	mg/kg	495	ND	95.8	50-148	6.11		13	

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/27/13 18:16

**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 3102403 - EPA 5030 Soil MS**

**Blank (3102403-BLK1)**

Prepared: 10/24/13 Analyzed: 10/25/13

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	"							
Surrogate: 1,2-Dichloroethane-d4	0.0407		"	0.0397		103	23-173			
Surrogate: Toluene-d8	0.0383		"	0.0400		95.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0400		103	21-167			

**LCS (3102403-BS1)**

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0820	0.0020	"	0.100		82.0	58-130			
Toluene	0.0960	0.0050	"	0.100		96.0	61-134			
Ethylbenzene	0.118	0.0050	"	0.100		118	74-139			
m,p-Xylene	0.226	0.010	"	0.200		113	73-137			
o-Xylene	0.119	0.0050	"	0.100		119	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0423		"	0.0397		107	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0402		"	0.0400		101	21-167			

**LCS (3102403-BS2)**

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0808	0.0020	"	0.100		80.8	58-130			
Toluene	0.0922	0.0050	"	0.100		92.2	61-134			
Ethylbenzene	0.119	0.0050	"	0.100		119	74-139			
m,p-Xylene	0.226	0.010	"	0.200		113	73-137			
o-Xylene	0.118	0.0050	"	0.100		118	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0411		"	0.0397		104	23-173			
Surrogate: Toluene-d8	0.0370		"	0.0400		92.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400		99.8	21-167			

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/27/13 18:16

**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 3102403 - EPA 5030 Soil MS**

**LCS Dup (3102403-BSD1)**

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0818	0.0020	"	0.100		81.8	58-130	0.256	13	
Toluene	0.0944	0.0050	"	0.100		94.4	61-134	1.61	16	
Ethylbenzene	0.120	0.0050	"	0.100		120	74-139	1.26	12	
m,p-Xylene	0.227	0.010	"	0.200		114	73-137	0.701	14	
o-Xylene	0.120	0.0050	"	0.100		120	73-141	1.00	12	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0406</i>		<i>"</i>	<i>0.0397</i>		<i>102</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0370</i>		<i>"</i>	<i>0.0400</i>		<i>92.5</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>21-167</i>			

**LCS Dup (3102403-BSD2)**

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0838	0.0020	"	0.100		83.8	58-130	3.64	13	
Toluene	0.0953	0.0050	"	0.100		95.3	61-134	3.30	16	
Ethylbenzene	0.120	0.0050	"	0.100		120	74-139	0.905	12	
m,p-Xylene	0.230	0.010	"	0.200		115	73-137	1.54	14	
o-Xylene	0.120	0.0050	"	0.100		120	73-141	1.01	12	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0411</i>		<i>"</i>	<i>0.0397</i>		<i>103</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0376</i>		<i>"</i>	<i>0.0400</i>		<i>93.9</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0403</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>21-167</i>			

**Matrix Spike (3102403-MS1)**

Source: R310231-01

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0812	0.0020	"	0.0977	ND	83.2	30-131			
Toluene	0.0932	0.0050	"	0.0977	ND	95.4	30-134			
Ethylbenzene	0.115	0.0050	"	0.0977	ND	118	22-153			
m,p-Xylene	0.220	0.010	"	0.195	ND	113	10-159			
o-Xylene	0.117	0.0050	"	0.0977	ND	119	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0427</i>		<i>"</i>	<i>0.0388</i>		<i>110</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0368</i>		<i>"</i>	<i>0.0391</i>		<i>94.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0394</i>		<i>"</i>	<i>0.0391</i>		<i>101</i>	<i>21-167</i>			

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/27/13 18:16

**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 3102403 - EPA 5030 Soil MS**

**Matrix Spike (3102403-MS2)**

Source: R310231-02

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0810	0.0020	"	0.0971	ND	83.4	30-131			
Toluene	0.0935	0.0050	"	0.0971	ND	96.3	30-134			
Ethylbenzene	0.116	0.0050	"	0.0971	ND	119	22-153			
m,p-Xylene	0.220	0.010	"	0.194	ND	113	10-159			
o-Xylene	0.115	0.0050	"	0.0971	ND	119	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0430		"	0.0385		112	23-173			
Surrogate: Toluene-d8	0.0364		"	0.0388		93.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0388		104	21-167			

**Matrix Spike Dup (3102403-MSD1)**

Source: R310231-01

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0800	0.0020	"	0.0982	ND	81.4	30-131	1.53		34
Toluene	0.0921	0.0050	"	0.0982	ND	93.8	30-134	1.13		30
Ethylbenzene	0.116	0.0050	"	0.0982	ND	118	22-153	0.537		24
m,p-Xylene	0.221	0.010	"	0.196	ND	112	10-159	0.281		68
o-Xylene	0.116	0.0050	"	0.0982	ND	118	31-151	0.270		38
Surrogate: 1,2-Dichloroethane-d4	0.0421		"	0.0390		108	23-173			
Surrogate: Toluene-d8	0.0365		"	0.0393		92.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0393		101	21-167			

**Matrix Spike Dup (3102403-MSD2)**

Source: R310231-02

Prepared: 10/24/13 Analyzed: 10/25/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			42
Benzene	0.0814	0.0020	"	0.0996	ND	81.7	30-131	0.449		34
Toluene	0.0927	0.0050	"	0.0996	ND	93.1	30-134	0.897		30
Ethylbenzene	0.115	0.0050	"	0.0996	ND	116	22-153	0.386		24
m,p-Xylene	0.220	0.010	"	0.199	ND	110	10-159	0.0735		68
o-Xylene	0.116	0.0050	"	0.0996	ND	117	31-151	0.901		38
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0395		108	23-173			
Surrogate: Toluene-d8	0.0374		"	0.0398		93.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0400		"	0.0398		100	21-167			

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/27/13 18:16

### Notes and Definitions

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

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Summit Scientific

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# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 30, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Heinze-Herber BU#1; 33-20

Enclosed are the results of analyses for samples received by Summit Scientific on 10/29/13 17:15. 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



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/30/13 21:35

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS05@10'	R310291-01	Soil	10/29/13 11:30	10/29/13 17:15
SS06@9'	R310291-02	Soil	10/29/13 11:30	10/29/13 17:15
SS07@9'	R310291-03	Soil	10/29/13 13:30	10/29/13 17:15
SS08@9'	R310291-04	Soil	10/29/13 13:30	10/29/13 17:15

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/30/13 21:35

**SS05@10'**  
**R310291-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 10/29/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102910	10/29/13	10/29/13	8015M	

Date Sampled: 10/29/13 11:30

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: 10/29/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102909	10/29/13	10/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1.4</b>	0.50	"	"	"	"	"	"	

Date Sampled: 10/29/13 11:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		135 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/30/13 21:35

**SS06@9'**  
**R310291-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/29/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102910	10/29/13	10/29/13	8015M	

Date Sampled: **10/29/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		91.2 %	30-150		"	"	"	"	

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

Date Sampled: **10/29/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102909	10/29/13	10/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>0.71</b>	0.50	"	"	"	"	"	"	

Date Sampled: **10/29/13 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		136 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %	21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/30/13 21:35

**SS07@9'**  
**R310291-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102910	10/29/13	10/29/13	8015M	

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		107 %	30-150		"	"	"	"	

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

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102909	10/29/13	10/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	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.



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/30/13 21:35

**SS08@9'**  
**R310291-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3102910	10/29/13	10/29/13	8015M	

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		110 %	30-150		"	"	"	"	

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

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3102909	10/29/13	10/29/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/29/13 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/30/13 21:35

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

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

**Batch 3102910 - EPA 3550A**

<b>Blank (3102910-BLK1)</b>				Prepared & Analyzed: 10/29/13							
C10-C28 (DRO)	73.0	50	mg/kg								
<b>LCS (3102910-BS1)</b>				Prepared & Analyzed: 10/29/13							
C10-C28 (DRO)	530	50	mg/kg	501	106	73-134					
<b>LCS Dup (3102910-BSD1)</b>				Prepared: 10/29/13 Analyzed: 10/30/13							
C10-C28 (DRO)	518	50	mg/kg	501	103	73-134	2.29		11		
<b>Matrix Spike (3102910-MS1)</b>				Source: R310289-01 Prepared: 10/29/13 Analyzed: 10/30/13							
C10-C28 (DRO)	519	50	mg/kg	499	ND	104	50-148				
<b>Matrix Spike Dup (3102910-MSD1)</b>				Source: R310289-01 Prepared: 10/29/13 Analyzed: 10/30/13							
C10-C28 (DRO)	522	50	mg/kg	494	ND	106	50-148	0.648	13		

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/30/13 21:35

**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 3102909 - EPA 5030 Soil MS**

**Blank (3102909-BLK1)**

Prepared & Analyzed: 10/29/13

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>0.0532</i>		<i>"</i>	<i>0.0397</i>		<i>134</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0392</i>		<i>"</i>	<i>0.0400</i>		<i>98.0</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0442</i>		<i>"</i>	<i>0.0400</i>		<i>110</i>	<i>21-167</i>			

**LCS (3102909-BS1)**

Prepared & Analyzed: 10/29/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0773	0.0020	"	0.100		77.3	58-130			
Toluene	0.0917	0.0050	"	0.100		91.7	61-134			
Ethylbenzene	0.100	0.0050	"	0.100		100	74-139			
m,p-Xylene	0.193	0.010	"	0.200		96.6	73-137			
o-Xylene	0.0982	0.0050	"	0.100		98.2	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0478</i>		<i>"</i>	<i>0.0397</i>		<i>121</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0406</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0421</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>21-167</i>			

**LCS Dup (3102909-BSD1)**

Prepared & Analyzed: 10/29/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0846	0.0020	"	0.100		84.6	58-130	9.04	13	
Toluene	0.0969	0.0050	"	0.100		96.9	61-134	5.50	16	
Ethylbenzene	0.111	0.0050	"	0.100		111	74-139	10.4	12	
m,p-Xylene	0.215	0.010	"	0.200		108	73-137	10.9	14	
o-Xylene	0.108	0.0050	"	0.100		108	73-141	9.90	12	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0449</i>		<i>"</i>	<i>0.0397</i>		<i>113</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0408</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/30/13 21:35

**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 3102909 - EPA 5030 Soil MS**

**Matrix Spike (3102909-MS1)**

**Source: R310289-01**

Prepared & Analyzed: 10/29/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0762	0.0020	"	0.0945	ND	80.6	30-131			
Toluene	0.0874	0.0050	"	0.0945	ND	92.4	30-134			
Ethylbenzene	0.103	0.0050	"	0.0945	ND	109	22-153			
m,p-Xylene	0.198	0.010	"	0.189	ND	105	10-159			
o-Xylene	0.101	0.0050	"	0.0945	ND	107	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0422</i>		<i>"</i>	<i>0.0375</i>		<i>112</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0373</i>		<i>"</i>	<i>0.0378</i>		<i>98.6</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0379</i>		<i>"</i>	<i>0.0378</i>		<i>100</i>	<i>21-167</i>			

**Matrix Spike Dup (3102909-MSD1)**

**Source: R310289-01**

Prepared & Analyzed: 10/29/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			42
Benzene	0.0761	0.0020	"	0.0969	ND	78.6	30-131	0.0751		34
Toluene	0.0881	0.0050	"	0.0969	ND	90.9	30-134	0.819		30
Ethylbenzene	0.103	0.0050	"	0.0969	ND	106	22-153	0.349		24
m,p-Xylene	0.198	0.010	"	0.194	ND	102	10-159	0.268		68
o-Xylene	0.100	0.0050	"	0.0969	ND	104	31-151	1.07		38
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0427</i>		<i>"</i>	<i>0.0385</i>		<i>111</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0381</i>		<i>"</i>	<i>0.0388</i>		<i>98.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0389</i>		<i>"</i>	<i>0.0388</i>		<i>100</i>	<i>21-167</i>			

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/30/13 21:35

### Notes and Definitions

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

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 31, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Heinze-Herber BU#1; 33-20

Enclosed are the results of analyses for samples received by Summit Scientific on 10/30/13 16:30. 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



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/31/13 21:59

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS10@9'	R310309-01	Soil	10/30/13 10:00	10/30/13 16:30
SS11@9'	R310309-02	Soil	10/30/13 10:50	10/30/13 16:30

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/31/13 21:59

**SS10@9'**  
**R310309-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: 10/30/13 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3103016	10/30/13	10/30/13	8015M	

Date Sampled: 10/30/13 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		88.2 %	30-150		"	"	"	"	

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

Date Sampled: 10/30/13 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3103015	10/30/13	10/30/13	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0056</b>	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>2.5</b>	0.50	"	"	"	"	"	"	

Date Sampled: 10/30/13 10:00

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/31/13 21:59

**SS11@9'**  
**R310309-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/30/13 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>72</b>	50	mg/kg	1	3103016	10/30/13	10/30/13	8015M	

Date Sampled: **10/30/13 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		88.5 %	30-150		"	"	"	"	

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

Date Sampled: **10/30/13 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3103015	10/30/13	10/30/13	EPA 8260B	
<b>Benzene</b>	<b>0.0021</b>	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.016</b>	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>4.2</b>	0.50	"	"	"	"	"	"	

Date Sampled: **10/30/13 10:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		38.6 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		35.4 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		38.8 %	21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/31/13 21:59

**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 3103016 - EPA 3550A**

<b>Blank (3103016-BLK1)</b>					Prepared & Analyzed: 10/30/13						
C10-C28 (DRO)	ND	50	mg/kg								
<b>LCS (3103016-BS1)</b>					Prepared & Analyzed: 10/30/13						
C10-C28 (DRO)	460	50	mg/kg	501	91.8	73-134					
<b>LCS Dup (3103016-BSD1)</b>					Prepared & Analyzed: 10/30/13						
C10-C28 (DRO)	482	50	mg/kg	501	96.1	73-134	4.57	11			
<b>Matrix Spike (3103016-MS1)</b>					Source: R310306-01 Prepared: 10/30/13 Analyzed: 10/31/13						
C10-C28 (DRO)	462	50	mg/kg	499	ND	92.6	50-148				
<b>Matrix Spike Dup (3103016-MSD1)</b>					Source: R310306-01 Prepared: 10/30/13 Analyzed: 10/31/13						
C10-C28 (DRO)	448	50	mg/kg	495	ND	90.6	50-148	2.96	13		

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/31/13 21:59

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

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

**Batch 3103015 - EPA 5030 Soil MS**

**Blank (3103015-BLK1)**

Prepared & Analyzed: 10/30/13

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	"								
Surrogate: 1,2-Dichloroethane-d4	0.0424		"	0.0397	107	23-173					
Surrogate: Toluene-d8	0.0395		"	0.0400	98.8	20-170					
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400	101	21-167					

**LCS (3103015-BS1)**

Prepared & Analyzed: 10/30/13

Naphthalene	ND	0.010	mg/kg			66-138					
Benzene	0.0806	0.0020	"	0.100	80.6	58-130					
Toluene	0.0936	0.0050	"	0.100	93.6	61-134					
Ethylbenzene	0.108	0.0050	"	0.100	108	74-139					
m,p-Xylene	0.209	0.010	"	0.200	104	73-137					
o-Xylene	0.105	0.0050	"	0.100	105	73-141					
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0397	108	23-173					
Surrogate: Toluene-d8	0.0402		"	0.0400	100	20-170					
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400	102	21-167					

**LCS Dup (3103015-BSD1)**

Prepared & Analyzed: 10/30/13

Naphthalene	ND	0.010	mg/kg			66-138			12		
Benzene	0.0792	0.0020	"	0.100	79.2	58-130	1.77		13		
Toluene	0.0926	0.0050	"	0.100	92.6	61-134	0.999		16		
Ethylbenzene	0.109	0.0050	"	0.100	109	74-139	0.221		12		
m,p-Xylene	0.211	0.010	"	0.200	105	73-137	1.07		14		
o-Xylene	0.105	0.0050	"	0.100	105	73-141	0.314		12		
Surrogate: 1,2-Dichloroethane-d4	0.0418		"	0.0397	105	23-173					
Surrogate: Toluene-d8	0.0390		"	0.0400	97.4	20-170					
Surrogate: 4-Bromofluorobenzene	0.0398		"	0.0400	99.5	21-167					

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/31/13 21:59

**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 3103015 - EPA 5030 Soil MS**

**Matrix Spike (3103015-MS1)**

Source: R310306-01

Prepared & Analyzed: 10/30/13

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0781	0.0020	"	0.0978	ND	79.8	30-131			
Toluene	0.0906	0.0050	"	0.0978	ND	92.6	30-134			
Ethylbenzene	0.106	0.0050	"	0.0978	ND	109	22-153			
m,p-Xylene	0.205	0.010	"	0.196	ND	105	10-159			
o-Xylene	0.104	0.0050	"	0.0978	ND	106	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0419		"	0.0388		108	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0391		98.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0393		"	0.0391		100	21-167			

**Matrix Spike Dup (3103015-MSD1)**

Source: R310306-01

Prepared: 10/30/13 Analyzed: 10/31/13

Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0798	0.0020	"	0.0994	ND	80.3	30-131	2.25	34	
Toluene	0.0938	0.0050	"	0.0994	ND	94.4	30-134	3.47	30	
Ethylbenzene	0.108	0.0050	"	0.0994	ND	109	22-153	1.83	24	
m,p-Xylene	0.209	0.010	"	0.199	ND	105	10-159	1.72	68	
o-Xylene	0.106	0.0050	"	0.0994	ND	107	31-151	2.48	38	
Surrogate: 1,2-Dichloroethane-d4	0.0436		"	0.0395		110	23-173			
Surrogate: Toluene-d8	0.0397		"	0.0398		99.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0398		100	21-167			

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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.



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Heinze-Herber BU#1; 33-20

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/31/13 21:59

### Notes and Definitions

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

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