



PDC Energy, Inc.
Fourth Quarter 2014 Groundwater Monitoring Summary

November 25, 2014

H&S (Mineral) #1 Tank Battery
NWSW S6 T4N R65W
Weld County, API # 05-123-14802

This groundwater summary has been prepared by Tasman Geosciences, LLC for the H&S (Mineral) #1 tank battery. On October 27, 2014, groundwater monitoring was conducted at eight monitoring well locations. Groundwater samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B. Analytical results are summarized in Table 1 below and the laboratory report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Fourth quarter analytical results indicate that BTEX concentrations are in exceedance of COGCC Table 910-1 standards at monitoring wells BH01, BH03, and BH04. Constituent concentrations are below regulatory standards at the other five monitoring locations.

Tasman initiated enhanced fluid recovery (EFR) and air sparge (AS) events at the site during the third quarter 2013. A summary of the EFR/AS operational data is provided in Table 2. EFR/AS will remain the selected remediation strategy through the first quarter 2015 to address residual dissolved phase petroleum hydrocarbon impacts on site.

The first quarter 2015 groundwater sampling event will be conducted during January 2015.

TABLE 1
H&S (MINERAL) #1
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (feet)
BH01	7/25/2013	6700	6200	1100	19000	16.53
BH01	10/31/2013	1700	1800	170	4400	15.65
BH01	1/24/2014	6.5	<1.0	<1.0	3000	17.19
BH01	4/30/2014	290	990	76	2700	17.35
BH01	7/25/2014	45	100	53	2100	14.68
BH01	10/27/2014	21	19	21	2100	13.75
BH02	7/25/2013	3300	4700	2100	36000	17.63
BH02	10/31/2013	770	24	39	3300	16.75
BH02	1/24/2014	730	20	<1.0	2600	18.25
BH02	4/30/2014	84	12	3.8	410	18.39
BH02	7/25/2014	53	2.3	<1.0	68	15.75
BH02	10/27/2014	4.3	<1.0	<1.0	24	14.91
BH03	7/25/2013	760	4400	1300	23000	15.98
BH03	10/31/2013	3.6	8.6	2.2	100	15.15
BH03	1/24/2014	2.6	2	<1.0	62	16.63
BH03	4/30/2014	1.1	1.6	<1.0	45	16.79
BH03	7/25/2014	33	20	<1.0	480	14.14
BH03	10/27/2014	17	3.3	<1.0	210	13.27
BH04	7/25/2013	1700	170	1200	19000	15.91
BH04	10/31/2013	2500	140	620	13000	15.09
BH04	1/24/2014	2100	320	740	14000	16.60
BH04	4/30/2014	1700	300	1100	19000	16.74
BH04	7/25/2014	410	9.3	36	6400	14.11
BH04	10/27/2014	37	2.4	<1.0	630	13.22
BH05	7/25/2013	17	3300	930	15000	13.07
BH05	10/31/2013	<1.0	<1.0	2.0	85	12.01
BH05	1/24/2014	<1.0	<1.0	<1.0	<1.0	13.52
BH05	4/30/2014	<1.0	<1.0	<1.0	4.5	13.65
BH05	7/25/2014	<1.0	<1.0	<1.0	5.8	11.03
BH05	10/27/2014	<1.0	<1.0	<1.0	2.9	10.37
BH06	7/25/2013	1.9	12	3100	46000	13.47
BH06	10/31/2013	<1.0	<1.0	1.9	57	12.46
BH06	1/24/2014	<1.0	<1.0	<1.0	2.9	13.95
BH06	4/30/2014	<1.0	<1.0	2.0	49	14.06
BH06	7/25/2014	<1.0	<1.0	<1.0	4.9	11.44
BH06	10/27/2014	<1.0	<1.0	<1.0	2.6	10.81

TABLE 1
H&S (MINERAL) #1
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (feet)
BH07	7/25/2013	<1.0	<1.0	<1.0	<1.0	15.33
BH07	10/31/2013	<1.0	<1.0	<1.0	<1.0	14.31
BH07	1/24/2014	<1.0	<1.0	<1.0	<1.0	15.81
BH07	4/30/2014	<1.0	<1.0	<1.0	<1.0	15.96
BH07	7/25/2014	<1.0	<1.0	<1.0	<1.0	13.27
BH07	10/27/2014	<1.0	<1.0	<1.0	<1.0	10.60
BH08	7/25/2013	<1.0	<1.0	<1.0	<1.0	13.47
BH08	10/31/2013	<1.0	<1.0	<1.0	<1.0	12.41
BH08	1/24/2014	<1.0	<1.0	<1.0	<1.0	13.91
BH08	4/30/2014	<1.0	<1.0	<1.0	<1.0	14.05
BH08	7/25/2014	<1.0	<1.0	<1.0	<1.0	11.42
COGCC standards for Groundwater (ug/L) ⁽¹⁾		5	560	700	1,400	

Notes:

1). The environmental cleanup standards for groundwater that are applicable to this site are the Colorado Oil and Gas Conservation Commission (COGCC) standards for contaminants in groundwater according to Table 910-1 of the COGCC 900 Series Rule for E&P Waste Management.

Bold red values indicate an exceedance of the COGCC groundwater standards for the site.

ug/L= Micrograms per liter

NM - Not Measured

TABLE 2
H&S (MINERAL) #1
AIR SPARGE/ EFR OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Injection Pressure (psi)
Third Quarter 2013					
8/6/2013	BH01, BH02, BH03, BH04, BH05, BH06	6	50	BH01, BH02, BH03, BH05, BH06	10
8/19/2013		6	80		10
9/8/2013		6	21		10
9/16/2013		6	80		10
9/30/2013		5	90		15
Quarterly Totals		29	321		-
Fourth Quarter 2013					
10/11/2013	BH01, BH02, BH03, BH04, BH05, BH06	6	80	BH01, BH02, BH03, BH05, BH06	10
10/24/2013		6	110		12
11/26/2013		6	40		10
12/17/2013		6	42		10
Quarterly Totals		24	272		-
First Quarter 2014					
1/7/2014	BH01, BH02, BH03, BH04, BH05, BH06	5.5	90	BH01, BH02, BH03, BH05, BH06	10
1/22/2014		6	230		10
2/24/2014		6	180		10
3/11/2014		6	90		10
3/20/2014		6	135		10
Quarterly Totals		29.5	725		-
Second Quarter 2014					
4/10/2014	BH01, BH02, BH03, BH04, BH05, BH06	8	230	BH01, BH02, BH03, BH04, BH05, BH06	10
4/23/2014		6	180		20
5/13/2014		6	220		10
5/28/2014		6	180		20
6/10/2014		8	270		25
6/23/2014		6	185		20
Quarterly Totals		40	1265		-

TABLE 2
H&S (MINERAL) #1
AIR SPARGE/ EFR OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)
Third Quarter 2014					
7/11/2014	BH01, BH02, BH03, BH04, BH05, BH06	6	150	BH01, BH02, BH03, BH04, BH05, BH06	20
7/16/2014		6	240		15
8/8/2014		6	250		15
8/25/2014		6	230		20
9/10/2014		6	300		20
9/22/2014		6	350		20
Quarterly Totals		36	1520		-
Fourth Quarter 2014					
10/10/2014	Pipe, BH01, BH02, BH03,BH05, BH06	6	100	BH01, BH02, BH03, BH04, BH05, BH06	20
10/24/2014		6	50		15
11/7/2014		6	270		20
Quarterly Totals		18	420		-



BH03		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	33	17
Toluene	20.0	3.3
Ethylbenzene	<1.0	<1.0
Total Xylenes	480	210

BH02		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	53	4.3
Toluene	2.3	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	68	24

Surface
Drainage

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

Fence Line

Steep Grade

Immobile Magna Equipment

BH02

Above Ground Gas Line

M

Separator 10 bbl

100 bbl
PW tank

300 bbl Oil
Tank

BH03

BH01

BH04

DCP Buried Gas Line

Flow Line

BH07

BH01		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	45	21
Toluene	100	19
Ethylbenzene	53	21
Total Xylenes	2100	2100

BH05

BH06

BH04		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	410	37
Toluene	9.3	2.4
Ethylbenzene	36	36
Total Xylenes	6400	630

BH05		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	5.8	2.9

BH08		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	<1.0	NS
Toluene	<1.0	NS
Ethylbenzene	<1.0	NS
Total Xylenes	<1.0	NS

Wellhead

BH08

BH06		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	4.9	2.6

BH07		
Compound (ug/L)	7/25/2014	10/27/2014
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

DRAWN BY: ATF

DATE: 11/12/2014

Facility Diagram
PDC Energy – DJ Basin
H&S (Mineral) #1
NWSW S6 T4N R65W
Weld County, CO



6899 Pecos Street
Unit C
Denver, CO 80221

LEGEND

- Earthen Berm
- Approximate Area of Excavation
- Temporary Monitoring Well
- Temporary Monitoring Well – SVE Screen
- Horizontal Remediation Pipe
- M Meter House

FIGURE 1
GROUNDWATER ANALYTICAL RESULTS
Not to Scale

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite J ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.374.5933 - fax

November 04, 2014

Brandon Bruns
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: H&S Mineral #1

Enclosed are the results of analyses for samples received by Summit Scientific on 10/27/14 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 "Joseph J Egry IV".

Joseph J Egry IV
Laboratory/Technical Director

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1410248-01	Water	10/27/14 12:13	10/27/14 17:15
BH02	1410248-02	Water	10/27/14 12:25	10/27/14 17:15
BH03	1410248-03	Water	10/27/14 12:10	10/27/14 17:15
BH04	1410248-04	Water	10/27/14 12:18	10/27/14 17:15
BH05	1410248-05	Water	10/27/14 12:32	10/27/14 17:15
BH06	1410248-06	Water	10/27/14 12:30	10/27/14 17:15
BH07	1410248-07	Water	10/27/14 12:19	10/27/14 17:15

Summit Scientific

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Joseph J Egry IV, Laboratory/Technical Director

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

Project: H&S Mineral #1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

Summit Scientific 1410248

741 Corporate Circle Suite I ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-277-9531 Fax

Page 1 of 1

Client: PDC Energy

Address:

Project Manager: Brandon Bruns

City/State/Zip: _____

E-Mail: bbruns@petd.com

Phone:

Fax:

Project Name: ~~HBS~~ HBS Mineral /

Sampler Name: Elliot Dillon Herzog

Project Number:

[illegible]

www.s2scientific.com

Soil samples reported on a wet-weight basis unless otherwise indicated on results page.

Summit Scientific

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Larry Flynt TV

Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

BH01
1410248-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/14 12:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	21	10	ug/l	10	1410346	11/01/14	11/01/14 23:53	EPA 8260B	
Toluene	19	1.0	"	1	"	"	"	"	
Ethylbenzene	21	1.0	"	"	"	"	"	"	
Xylenes (total)	2100	10	"	10	"	"	"	"	

Date Sampled: **10/27/14 12:13**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	86.1 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	94.3 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	94.9 %	45-146			"	"	"	"	

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Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

BH02
1410248-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/14 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	4.3	1.0	ug/l	1	1410346	11/02/14	11/02/14 00:17	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	24	1.0	"	"	"	"	"	"	

Date Sampled: **10/27/14 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	84.3 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	92.6 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.2 %	45-146			"	"	"	"	

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Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

BH03
1410248-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/14 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	17	1.0	ug/l	1	1410346	11/02/14	11/02/14 00:44	EPA 8260B	
Toluene	3.3	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	210	10	"	10	"	"	"	"	

Date Sampled: **10/27/14 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	88.5 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	94.5 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.3 %	45-146			"	"	"	"	

Summit Scientific

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Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

BH04
1410248-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/14 12:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	37	1.0	ug/l	1	1410346	11/02/14	11/02/14 01:12	EPA 8260B	
Toluene	2.4	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	630	1.0	"	"	"	"	"	"	

Date Sampled: **10/27/14 12:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	85.8 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	93.8 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.1 %	45-146			"	"	"	"	

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Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

BH05
1410248-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/14 12:32**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1410346	11/02/14	11/02/14 01:36	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	2.9	1.0	"	"	"	"	"	"	

Date Sampled: **10/27/14 12:32**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	84.2 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.7 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.6 %	45-146			"	"	"	"	

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Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

BH06
1410248-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/14 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1410346	11/02/14	11/02/14 02:01	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	2.6	1.0	"	"	"	"	"	"	

Date Sampled: **10/27/14 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	84.8 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.8 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.8 %	45-146			"	"	"	"	

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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.

Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

BH07
1410248-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/14 12:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1410346	11/02/14	11/02/14 01:25	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **10/27/14 12:19**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	85.2 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	93.3 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.8 %	45-146			"	"	"	"	

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.

Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

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

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

Batch 1410346 - EPA 5030 Water MS

Blank (1410346-BLK1)

Prepared & Analyzed: 11/01/14

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>11.4</i>		<i>"</i>	<i>13.2</i>		<i>86.7</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.6</i>		<i>"</i>	<i>13.3</i>		<i>94.6</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>97.0</i>	<i>45-146</i>			

LCS (1410346-BS1)

Prepared & Analyzed: 11/01/14

Benzene	40.1	1.0	ug/l	33.3		120	51-132			
Toluene	40.1	1.0	"	33.3		120	51-138			
Ethylbenzene	40.9	1.0	"	33.1		124	58-146			
m,p-Xylene	81.0	2.0	"	66.5		122	57-144			
o-Xylene	40.3	1.0	"	32.8		123	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>11.2</i>		<i>"</i>	<i>13.2</i>		<i>85.0</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>96.1</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>96.1</i>	<i>45-146</i>			

Matrix Spike (1410346-MS1)

Source: 1410246-06

Prepared & Analyzed: 11/01/14

Benzene	40.6	1.0	ug/l	33.3	ND	122	34-141			
Toluene	40.1	1.0	"	33.3	ND	120	27-151			
Ethylbenzene	41.1	1.0	"	33.1	ND	124	29-160			
m,p-Xylene	81.4	2.0	"	66.5	ND	122	20-166			
o-Xylene	40.8	1.0	"	32.8	ND	124	33-159			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>11.4</i>		<i>"</i>	<i>13.2</i>		<i>86.2</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>96.0</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>96.7</i>	<i>45-146</i>			

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Joseph J Egry IV, Laboratory/Technical Director



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

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 1410346 - EPA 5030 Water MS

Matrix Spike Dup (1410346-MSD1)	Source: 1410246-06			Prepared & Analyzed: 11/01/14						
Benzene	39.3	1.0	ug/l	33.3	ND	118	34-141	3.30	32	
Toluene	39.7	1.0	"	33.3	ND	119	27-151	0.802	25	
Ethylbenzene	41.6	1.0	"	33.1	ND	126	29-160	1.35	50	
m,p-Xylene	81.3	2.0	"	66.5	ND	122	20-166	0.0615	36	
o-Xylene	40.8	1.0	"	32.8	ND	125	33-159	0.196	26	
Surrogate: 1,2-Dichloroethane-d4	11.1		"	13.2		84.2	37-154			
Surrogate: Toluene-d8	12.8		"	13.3		96.0	45-149			
Surrogate: 4-Bromofluorobenzene	12.6		"	13.3		94.8	45-146			

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/04/14 08:54

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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A handwritten signature in black ink, appearing to read 'Joseph J Egry IV'.

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Joseph J Egry IV, Laboratory/Technical Director