



PDC Energy, Inc.
Fourth Quarter 2013 Groundwater Monitoring Summary

January 10, 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 July 11, 2013, eight temporary wells were installed for groundwater monitoring and remediation purposes. Fourth quarter groundwater sampling was conducted on October 31, 2013 at the 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 laboratory reports are included as Attachment A. Sample locations and corresponding fourth quarter 2013 analytical results are illustrated on Figure 1. Fourth quarter analytical results indicate that BTEX concentrations are in exceedance of COGCC regulatory limits at three of the eight monitoring well locations. Constituent concentrations remain below detection limits at the two point of compliance (POC) well 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 2014 to address residual dissolved phase petroleum hydrocarbon impacts on site.

The first quarter 2014 groundwater sampling event will be conducted during January 2014.

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 | 8/31/2013 | 1700 | 1800 | 170 | 4400 | 15.65 |
| BH02 | 7/25/2013 | 3300 | 4700 | 2100 | 36000 | 17.63 |
| BH02 | 8/31/2013 | 770 | 24 | 39 | 3300 | 16.75 |
| BH03 | 7/25/2013 | 760 | 4400 | 1300 | 23000 | 15.98 |
| BH03 | 8/31/2013 | 3.6 | 8.6 | 2.2 | 100 | 15.15 |
| BH04 | 7/25/2013 | 1700 | 170 | 1200 | 19000 | 15.91 |
| BH04 | 8/31/2013 | 2500 | 140 | 620 | 13000 | 15.09 |
| BH05 | 7/25/2013 | 17 | 3300 | 930 | 15000 | 13.07 |
| BH05 | 8/31/2013 | <1.0 | <1.0 | 2 | 85 | 12.01 |
| BH06 | 7/25/2013 | 1.9 | 12 | 3100 | 46000 | 13.47 |
| BH06 | 8/31/2013 | <1.0 | <1.0 | 1.9 | 57 | 12.46 |
| BH07 | 7/25/2013 | <1.0 | <1.0 | <1.0 | <1.0 | 15.33 |
| BH07 | 8/31/2013 | <1.0 | <1.0 | <1.0 | <1.0 | 14.31 |
| BH08 | 7/25/2013 | <1.0 | <1.0 | <1.0 | <1.0 | 13.47 |
| BH08 | 8/31/2013 | <1.0 | <1.0 | <1.0 | <1.0 | 12.41 |
| 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

NR - Not Recorded

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

| Third Quarter 2013 | | | | | |
|---------------------|---------------------------------------|-------------------------------|-------------------------------|---------------------------------|--------------------------|
| Date | EFR Wells | Total EFR/AS Duration (hours) | Approximate Gallons Extracted | AS Wells | Injection Pressure (psi) |
| 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 |
| Totals | | 29 | 321 | | - |
| Fourth Quarter 2013 | | | | | |
| 10/11/2013 | BH01, BH02, BH03, | 6 | 80 | BH01, BH02, BH03, | 10 |
| 10/24/2013 | BH04, BH05, BH06 | 6 | 110 | BH05, BH06 | 12 |
| Totals | | 12 | 190 | | - |



| BH03 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | 760 | 3.6 |
| Toluene | 4,400 | 8.6 |
| Ethylbenzene | 1,300 | 2.2 |
| Total Xylenes | 23,000 | 100 |

| BH02 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | 3,300 | 770 |
| Toluene | 4,700 | 24 |
| Ethylbenzene | 2,100 | 39 |
| Total Xylenes | 36,000 | 3300 |

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

BH03

BH01

BH04

M

Separator 10 bbl

100 bbl PW tank

300 bbl Oil Tank

Flow Line

DCP Buried Gas Line

| BH01 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | 6,700 | 1700 |
| Toluene | 6,200 | 1800 |
| Ethylbenzene | 1,100 | 170 |
| Total Xylenes | 19,000 | 4400 |

BH05

BH06

| BH04 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | 1,700 | 2500 |
| Toluene | 170 | 140 |
| Ethylbenzene | 1,200 | 620 |
| Total Xylenes | 19,000 | 13000 |

| BH05 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | 17 | <1.0 |
| Toluene | 3,300 | <1.0 |
| Ethylbenzene | 930 | 2 |
| Total Xylenes | 15,000 | 85 |

| BH08 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | <1.0 | <1.0 |
| Toluene | <1.0 | <1.0 |
| Ethylbenzene | <1.0 | <1.0 |
| Total Xylenes | <1.0 | <1.0 |

Wellhead

BH08

| BH06 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | 1.9 | <1.0 |
| Toluene | 12 | <1.0 |
| Ethylbenzene | 3,100 | 1.9 |
| Total Xylenes | 46,000 | 57 |

| BH07 | | |
|-----------------|-----------|------------|
| Compound (ug/L) | 7/25/2013 | 10/31/2013 |
| Benzene | <1.0 | <1.0 |
| Toluene | <1.0 | <1.0 |
| Ethylbenzene | <1.0 | <1.0 |
| Total Xylenes | <1.0 | <1.0 |

BH07

DRAWN BY: BAM

DATE: 11/20/2013

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
- Meter House

FIGURE 1

GROUNDWATER
ANALYTICAL RESULTS
MAP
Not to Scale

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 07, 2013

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 10/31/13 17:00. 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



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

Project: H&S Mineral #1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/07/13 18:22

ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|-----------|---------------|--------|----------------|----------------|
| BH01 | R310334-01 | Water | 10/31/13 13:15 | 10/31/13 17:00 |
| BH02 | R310334-02 | Water | 10/31/13 13:20 | 10/31/13 17:00 |
| BH03 | R310334-03 | Water | 10/31/13 13:25 | 10/31/13 17:00 |
| BH04 | R310334-04 | Water | 10/31/13 13:30 | 10/31/13 17:00 |
| BH05 | R310334-05 | Water | 10/31/13 13:35 | 10/31/13 17:00 |
| BH06 | R310334-06 | Water | 10/31/13 13:40 | 10/31/13 17:00 |
| BH07 | R310334-07 | Water | 10/31/13 13:45 | 10/31/13 17:00 |
| BH08 | R310334-08 | Water | 10/31/13 13:50 | 10/31/13 17:00 |

Summit Scientific

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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 Brunns

Reported:
 11/07/13 18:22

R310334

Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401
 303-277-9310 • 303-374-9333 Fax

Client: PDC/Tasman Page 1 of 1

Address: _____
 City/State/Zip: _____
 Project Manager: Brandon Brunns
 E-Mail: _____
 Project Name: H&S (Mineral) #1
 Project Number: _____
 Phone: _____
 Fax: _____
 Sampler Name: Eric S. Hill

| Sample Description | Date Sampled | Time Sampled | Number of Containers | Preservative | | | | Matrix | | | | Analyze For: | Special Instructions | |
|--------------------|--------------|--------------|----------------------|--------------|------------------|------|-----------------|-------------|------|-------------------------|-----------------|--------------|----------------------|--|
| | | | | HCl | HNO ₃ | None | Other (Specify) | Groundwater | Soil | Air - Canister Serial # | Other (Specify) | | | |
| 6401 | 10/31/13 | 1315 | 3 | X | | | | X | | | | | | |
| 6402 | | 1300 | | | | | | | | | | | | |
| 6403 | | 1305 | | | | | | | | | | | | |
| 6404 | | 1330 | | | | | | | | | | | | |
| 6405 | | 1335 | | | | | | | | | | | | |
| 6406 | | 1340 | | | | | | | | | | | | |
| 6407 | | 1345 | | | | | | | | | | | | |
| 6408 | | 1350 | | | | | | | | | | | | |

Requisitioned by: Eric S. Hill Date/Time: 10/31/13 1315
 Received by: [Signature] Date/Time: 10/31/13 1700
 Requisitioned by: _____ Date/Time: _____
 Received by: _____ Date/Time: _____

Turn Around Time (Check):
 Same Day 24 Hours 48 Hours 72 Hours Standard

Notes: _____

Sample Integrity:
 Temperature Upon Receipt: 6°C
 Intact: No

www.sscientific.com





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

Project: H&S Mineral #1

Project Number: [none]
 Project Manager: Brandon Bruns

Reported:
 11/07/13 18:22

BH01
R310334-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:15**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|-------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | 1700 | 100 | ug/l | 100 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | 1800 | 100 | " | " | " | " | " | " | |
| Ethylbenzene | 170 | 100 | " | " | " | " | " | " | |
| Xylenes (total) | 4400 | 100 | " | " | " | " | " | " | |

Date Sampled: **10/31/13 13:15**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 104 % | 37-154 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 101 % | 45-149 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 100 % | 45-146 | | " | " | " | " | |

Summit Scientific

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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 Brunns

Reported:
 11/07/13 18:22

BH02
R310334-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:20**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|-------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | 770 | 100 | ug/l | 100 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | 24 | 1.0 | " | 1 | " | " | " | " | |
| Ethylbenzene | 39 | 1.0 | " | " | " | " | " | " | |
| Xylenes (total) | 3300 | 100 | " | 100 | " | " | " | " | |

Date Sampled: **10/31/13 13:20**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 107 % | 37-154 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 104 % | 45-149 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 99.0 % | 45-146 | | " | " | " | " | |

Summit Scientific

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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:
 11/07/13 18:22

BH03
R310334-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:25**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | 3.6 | 1.0 | ug/l | 1 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | 8.6 | 1.0 | " | " | " | " | " | " | |
| Ethylbenzene | 2.2 | 1.0 | " | " | " | " | " | " | |
| Xylenes (total) | 100 | 1.0 | " | " | " | " | " | " | |

Date Sampled: **10/31/13 13:25**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 99.4 % | 37-154 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 99.4 % | 45-149 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 97.4 % | 45-146 | | " | " | " | " | |

Summit Scientific

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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:
 11/07/13 18:22

BH04
R310334-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:30**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|--------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | 2500 | 100 | ug/l | 100 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | 140 | 100 | " | " | " | " | " | " | |
| Ethylbenzene | 620 | 100 | " | " | " | " | " | " | |
| Xylenes (total) | 13000 | 100 | " | " | " | " | " | " | |

Date Sampled: **10/31/13 13:30**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 103 % | 37-154 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 99.9 % | 45-149 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 97.4 % | 45-146 | | " | " | " | " | |

Summit Scientific

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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:
 11/07/13 18:22

BH05
R310334-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:35**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 1.0 | ug/l | 1 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | ND | 1.0 | " | " | " | " | " | " | |
| Ethylbenzene | 2.0 | 1.0 | " | " | " | " | " | " | |
| Xylenes (total) | 85 | 1.0 | " | " | " | " | " | " | |

Date Sampled: **10/31/13 13:35**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 101 % | 37-154 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 99.8 % | 45-149 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 97.1 % | 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 Brunns

Reported:
 11/07/13 18:22

BH06
R310334-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:40**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|------------------------|------------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 1.0 | ug/l | 1 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | ND | 1.0 | " | " | " | " | " | " | |
| Ethylbenzene | 1.9 | 1.0 | " | " | " | " | " | " | |
| Xylenes (total) | 57 | 1.0 | " | " | " | " | " | " | |

Date Sampled: **10/31/13 13:40**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 98.2 % | 37-154 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 98.6 % | 45-149 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 98.0 % | 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 Brunns

Reported:
 11/07/13 18:22

BH07
R310334-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 1.0 | ug/l | 1 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | ND | 1.0 | " | " | " | " | " | " | |
| Ethylbenzene | ND | 1.0 | " | " | " | " | " | " | |
| Xylenes (total) | ND | 1.0 | " | " | " | " | " | " | |

Date Sampled: **10/31/13 13:45**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|---------------|----------|----------|----------|----------|----------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | <i>106 %</i> | <i>37-154</i> | | <i>"</i> | <i>"</i> | <i>"</i> | <i>"</i> | |
| <i>Surrogate: Toluene-d8</i> | | <i>99.3 %</i> | <i>45-149</i> | | <i>"</i> | <i>"</i> | <i>"</i> | <i>"</i> | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | <i>101 %</i> | <i>45-146</i> | | <i>"</i> | <i>"</i> | <i>"</i> | <i>"</i> | |

Summit Scientific

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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 Brunns

Reported:
 11/07/13 18:22

BH08
R310334-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:50**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------|--------|-----------------|-------|----------|---------|----------|----------|-----------|-------|
| Benzene | ND | 1.0 | ug/l | 1 | 3110508 | 11/06/13 | 11/06/13 | EPA 8260B | |
| Toluene | ND | 1.0 | " | " | " | " | " | " | |
| Ethylbenzene | ND | 1.0 | " | " | " | " | " | " | |
| Xylenes (total) | ND | 1.0 | " | " | " | " | " | " | |

Date Sampled: **10/31/13 13:50**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|-----------------------------------------|--------|-----------------|--------|----------|-------|----------|----------|--------|-------|
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | | 102 % | 37-154 | | " | " | " | " | |
| <i>Surrogate: Toluene-d8</i> | | 99.8 % | 45-149 | | " | " | " | " | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | | 99.4 % | 45-146 | | " | " | " | " | |

Summit Scientific

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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 Brunns

Reported:
11/07/13 18:22

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 3110508 - EPA 5030 Water MS

Blank (3110508-BLK1)

Prepared & Analyzed: 11/05/13

| | | | | | | | | | | |
|----------------------------------|------|-----|------|------|--|------|--------|--|--|--|
| Benzene | ND | 1.0 | ug/l | | | | | | | |
| Toluene | ND | 1.0 | " | | | | | | | |
| Ethylbenzene | ND | 1.0 | " | | | | | | | |
| Xylenes (total) | ND | 1.0 | " | | | | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 13.6 | | " | 13.2 | | 102 | 37-154 | | | |
| Surrogate: Toluene-d8 | 13.0 | | " | 13.3 | | 97.7 | 45-149 | | | |
| Surrogate: 4-Bromofluorobenzene | 13.3 | | " | 13.3 | | 100 | 45-146 | | | |

LCS (3110508-BS1)

Prepared & Analyzed: 11/05/13

| | | | | | | | | | | |
|----------------------------------|------|-----|------|------|--|------|--------|--|--|--|
| Benzene | 32.9 | 1.0 | ug/l | 33.3 | | 98.7 | 51-132 | | | |
| Toluene | 33.6 | 1.0 | " | 33.3 | | 101 | 51-138 | | | |
| Ethylbenzene | 34.7 | 1.0 | " | 33.3 | | 104 | 58-146 | | | |
| m,p-Xylene | 67.7 | 2.0 | " | 66.7 | | 102 | 57-144 | | | |
| o-Xylene | 33.1 | 1.0 | " | 33.3 | | 99.2 | 53-146 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 13.6 | | " | 13.2 | | 102 | 37-154 | | | |
| Surrogate: Toluene-d8 | 13.4 | | " | 13.3 | | 100 | 45-149 | | | |
| Surrogate: 4-Bromofluorobenzene | 13.1 | | " | 13.3 | | 98.0 | 45-146 | | | |

LCS (3110508-BS2)

Prepared & Analyzed: 11/05/13

| | | | | | | | | | | |
|----------------------------------|------|-----|------|------|--|------|--------|--|--|--|
| Benzene | 32.9 | 1.0 | ug/l | 33.3 | | 98.8 | 51-132 | | | |
| Toluene | 33.6 | 1.0 | " | 33.3 | | 101 | 51-138 | | | |
| Ethylbenzene | 35.3 | 1.0 | " | 33.3 | | 106 | 58-146 | | | |
| m,p-Xylene | 69.1 | 2.0 | " | 66.7 | | 104 | 57-144 | | | |
| o-Xylene | 34.0 | 1.0 | " | 33.3 | | 102 | 53-146 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 13.5 | | " | 13.2 | | 102 | 37-154 | | | |
| Surrogate: Toluene-d8 | 13.4 | | " | 13.3 | | 101 | 45-149 | | | |
| Surrogate: 4-Bromofluorobenzene | 13.2 | | " | 13.3 | | 98.9 | 45-146 | | | |

Summit Scientific

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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 Brunns

Reported:
11/07/13 18:22

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 | | |

Batch 3110508 - EPA 5030 Water MS

LCS Dup (3110508-BSD1)

Prepared & Analyzed: 11/05/13

| | | | | | | | | | |
|----------------------------------|------|-----|------|------|--|------|--------|--------|----|
| Benzene | 33.1 | 1.0 | ug/l | 33.3 | | 99.3 | 51-132 | 0.606 | 17 |
| Toluene | 33.6 | 1.0 | " | 33.3 | | 101 | 51-138 | 0.0298 | 17 |
| Ethylbenzene | 34.9 | 1.0 | " | 33.3 | | 105 | 58-146 | 0.575 | 16 |
| m,p-Xylene | 68.2 | 2.0 | " | 66.7 | | 102 | 57-144 | 0.721 | 16 |
| o-Xylene | 33.2 | 1.0 | " | 33.3 | | 99.7 | 53-146 | 0.452 | 15 |
| Surrogate: 1,2-Dichloroethane-d4 | 13.4 | | " | 13.2 | | 101 | 37-154 | | |
| Surrogate: Toluene-d8 | 13.5 | | " | 13.3 | | 101 | 45-149 | | |
| Surrogate: 4-Bromofluorobenzene | 13.0 | | " | 13.3 | | 97.5 | 45-146 | | |

LCS Dup (3110508-BSD2)

Prepared & Analyzed: 11/05/13

| | | | | | | | | | |
|----------------------------------|------|-----|------|------|--|------|--------|--------|----|
| Benzene | 32.9 | 1.0 | ug/l | 33.3 | | 98.7 | 51-132 | 0.152 | 17 |
| Toluene | 33.6 | 1.0 | " | 33.3 | | 101 | 51-138 | 0.0298 | 17 |
| Ethylbenzene | 35.6 | 1.0 | " | 33.3 | | 107 | 58-146 | 0.902 | 16 |
| m,p-Xylene | 69.5 | 2.0 | " | 66.7 | | 104 | 57-144 | 0.649 | 16 |
| o-Xylene | 34.0 | 1.0 | " | 33.3 | | 102 | 53-146 | 0.0294 | 15 |
| Surrogate: 1,2-Dichloroethane-d4 | 13.6 | | " | 13.2 | | 103 | 37-154 | | |
| Surrogate: Toluene-d8 | 13.4 | | " | 13.3 | | 100 | 45-149 | | |
| Surrogate: 4-Bromofluorobenzene | 13.2 | | " | 13.3 | | 99.2 | 45-146 | | |

Matrix Spike (3110508-MS1)

Source: R310336-03

Prepared & Analyzed: 11/05/13

| | | | | | | | | | |
|----------------------------------|------|-----|------|------|----|------|--------|--|--|
| Benzene | 32.8 | 1.0 | ug/l | 33.3 | ND | 98.6 | 34-141 | | |
| Toluene | 33.6 | 1.0 | " | 33.3 | ND | 101 | 27-151 | | |
| Ethylbenzene | 35.3 | 1.0 | " | 33.3 | ND | 106 | 29-160 | | |
| m,p-Xylene | 68.8 | 2.0 | " | 66.7 | ND | 103 | 20-166 | | |
| o-Xylene | 33.6 | 1.0 | " | 33.3 | ND | 101 | 33-159 | | |
| Surrogate: 1,2-Dichloroethane-d4 | 13.6 | | " | 13.2 | | 103 | 37-154 | | |
| Surrogate: Toluene-d8 | 13.3 | | " | 13.3 | | 100 | 45-149 | | |
| Surrogate: 4-Bromofluorobenzene | 13.1 | | " | 13.3 | | 98.1 | 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 Brunns

Reported:
11/07/13 18:22

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 3110508 - EPA 5030 Water MS

| Matrix Spike (3110508-MS2) | | Source: R310336-04 | | | Prepared & Analyzed: 11/05/13 | | | | | |
|-----------------------------------------|-------------|---------------------------|----------|-------------|------------------------------------------|-------------|---------------|--|--|--|
| Benzene | 33.2 | 1.0 | ug/l | 33.3 | ND | 99.7 | 34-141 | | | |
| Toluene | 33.8 | 1.0 | " | 33.3 | ND | 101 | 27-151 | | | |
| Ethylbenzene | 35.3 | 1.0 | " | 33.3 | ND | 106 | 29-160 | | | |
| m,p-Xylene | 69.0 | 2.0 | " | 66.7 | ND | 104 | 20-166 | | | |
| o-Xylene | 33.2 | 1.0 | " | 33.3 | ND | 99.6 | 33-159 | | | |
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | <i>13.6</i> | | <i>"</i> | <i>13.2</i> | | <i>102</i> | <i>37-154</i> | | | |
| <i>Surrogate: Toluene-d8</i> | <i>13.4</i> | | <i>"</i> | <i>13.3</i> | | <i>100</i> | <i>45-149</i> | | | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | <i>13.1</i> | | <i>"</i> | <i>13.3</i> | | <i>98.3</i> | <i>45-146</i> | | | |

| Matrix Spike Dup (3110508-MSD1) | | Source: R310336-03 | | | Prepared & Analyzed: 11/05/13 | | | | | |
|-----------------------------------------|-------------|---------------------------|----------|-------------|------------------------------------------|-------------|---------------|-------|----|--|
| Benzene | 32.6 | 1.0 | ug/l | 33.3 | ND | 97.9 | 34-141 | 0.641 | 32 | |
| Toluene | 33.4 | 1.0 | " | 33.3 | ND | 100 | 27-151 | 0.626 | 25 | |
| Ethylbenzene | 35.1 | 1.0 | " | 33.3 | ND | 105 | 29-160 | 0.569 | 50 | |
| m,p-Xylene | 69.0 | 2.0 | " | 66.7 | ND | 103 | 20-166 | 0.232 | 36 | |
| o-Xylene | 33.3 | 1.0 | " | 33.3 | ND | 100 | 33-159 | 0.896 | 26 | |
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | <i>13.9</i> | | <i>"</i> | <i>13.2</i> | | <i>105</i> | <i>37-154</i> | | | |
| <i>Surrogate: Toluene-d8</i> | <i>13.4</i> | | <i>"</i> | <i>13.3</i> | | <i>101</i> | <i>45-149</i> | | | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | <i>13.1</i> | | <i>"</i> | <i>13.3</i> | | <i>98.4</i> | <i>45-146</i> | | | |

| Matrix Spike Dup (3110508-MSD2) | | Source: R310336-04 | | | Prepared & Analyzed: 11/05/13 | | | | | |
|-----------------------------------------|-------------|---------------------------|----------|-------------|------------------------------------------|-------------|---------------|--------|----|--|
| Benzene | 32.9 | 1.0 | ug/l | 33.3 | ND | 98.8 | 34-141 | 0.937 | 32 | |
| Toluene | 33.8 | 1.0 | " | 33.3 | ND | 101 | 27-151 | 0.0296 | 25 | |
| Ethylbenzene | 35.6 | 1.0 | " | 33.3 | ND | 107 | 29-160 | 1.04 | 50 | |
| m,p-Xylene | 69.8 | 2.0 | " | 66.7 | ND | 105 | 20-166 | 1.04 | 36 | |
| o-Xylene | 34.0 | 1.0 | " | 33.3 | ND | 102 | 33-159 | 2.29 | 26 | |
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | <i>13.4</i> | | <i>"</i> | <i>13.2</i> | | <i>101</i> | <i>37-154</i> | | | |
| <i>Surrogate: Toluene-d8</i> | <i>13.4</i> | | <i>"</i> | <i>13.3</i> | | <i>100</i> | <i>45-149</i> | | | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | <i>13.2</i> | | <i>"</i> | <i>13.3</i> | | <i>99.2</i> | <i>45-146</i> | | | |

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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:
11/07/13 18:22

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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