



**PDC Energy, Inc.**  
Second Quarter 2013 Groundwater Monitoring Summary

June 14, 2013

Capehart 1, 31, 42-29 Tank Battery  
SWNE Section 29 T6N R64W  
Weld County, API # 05-123-20040

This groundwater monitoring summary has been prepared by Tasman Geosciences, LLC for the Capehart 1, 31, 42-29 tank battery. On May 2, 2013, groundwater sampling was conducted at three monitoring well locations and one surface water location at the pond located immediately east of the facility. Groundwater samples were submitted for laboratory analysis of BTEX constituents using USEPA Method 8260B. Groundwater analytical results are summarized in Table 1 and surface water analytical results are summarized in Table 2. A complete laboratory report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 2. Second quarter analytical results indicate that BTEX concentrations are below laboratory detection limits for a third consecutive quarter at all four sample locations.

Two enhanced fluid recovery (EFR) events were conducted during the first and second quarters of 2012 at the horizontal remediation pipe installed during excavation activities. A summary of EFR operational data is provided below in Table 3. EFR was discontinued after data collected during the fourth quarter 2012 sampling event indicated that groundwater concentrations were below regulatory standards. Monitored natural attenuation will remain the selected remedial strategy as constituent concentrations have not rebounded following discontinuation of EFR/AS activities. One additional quarter with BTEX concentrations below regulatory standards is required in order to achieve site closure.

Third quarter 2013 groundwater sampling will be conducted during July 2013.

**TABLE 1**  
**CAPEHART 1, 31, 42-29**  
**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)
GW01	3/13/2012	<b>100</b>	280	16	175	NM
GW02	3/14/2012	<b>12</b>	14	<1.0	5.2	NM
GW03	3/14/2012	<1.0	<1.0	<1.0	<1.0	NM
BH01	10/1/2012	<1.0	<1.0	<1.0	<1.0	5.61
BH01	1/28/2013	<1.0	<1.0	<1.0	<1.0	5.62
BH01	5/2/2013	<1.0	<1.0	<1.0	<1.0	4.63
BH02	10/1/2012	<1.0	<1.0	<1.0	<1.0	7.93
BH02	1/28/2013	<1.0	<1.0	<1.0	<1.0	8.12
BH02	5/2/2013	<1.0	<1.0	<1.0	<1.0	7.41
BH03	10/1/2012	<1.0	<1.0	<1.0	<1.0	6.70
BH03	1/28/2013	<1.0	<1.0	<1.0	<1.0	4.83
BH03	5/2/2013	<1.0	<1.0	<1.0	<1.0	4.06
<b>COGCC standards for Groundwater (ug/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	

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.

Sample locations are shown on Figure 2.

ug/L= Micrograms per liter.

NM = Not Measured

**TABLE 2  
CAPEHART 1, 31, 42-29  
SURFACE WATER 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)
SW01	3/16/2012	<1.0	<1.0	<1.0	<1.0	NM
SURFACE	1/28/2013	<1.0	<1.0	<1.0	<1.0	NM
SURFACE	5/2/2013	<1.0	<1.0	<1.0	<1.0	NM
<b>WQCC Basic Standards for Organic Chemicals (ug/L) <sup>(1)</sup></b>		<b>2.3</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	

Notes:

1). The environmental cleanup standards for surface water that are applicable to this site were referenced from the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC) Basic Standards for Organic Chemicals Table (Table). Regulation 31, 5 CCR 1002-31. Note that where there are two standards listed on the Table, the lower standard has been referenced.

**Bold** red values indicate an exceedance of the WQCC Standards for surface water.

Sample locations are shown on Figure 2.

ug/L= Micrograms per liter.

NM = Not Measured

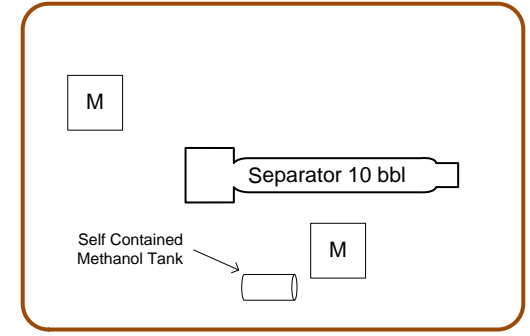
**TABLE 3  
CAPEHART 1, 31, 42-29  
EFR OPERATIONAL SUMMARY TABLE**

Date	EFR Wells	Total EFR Duration (hours)	Approximate Gallons Extracted
4/10/2012	H01 & H02	8	42
7/4/2012	H01 & H02	8	294



Surface Drainage

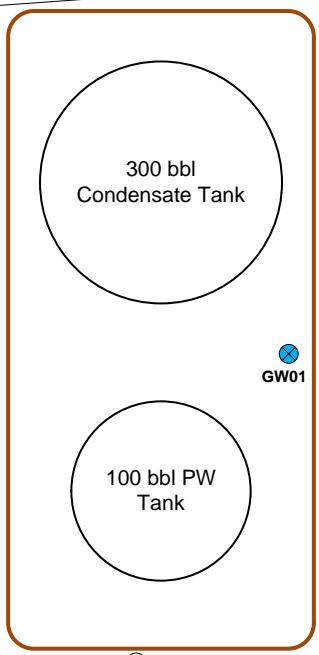
Access Road



Drainage Flow →

SW01

BH01		
Compound (ug/L)	1/28/2013	5/2/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0



SURFACE		
Compound (ug/L)	1/28/2013	5/2/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH03		
Compound (ug/L)	1/28/2013	5/2/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH02		
Compound (ug/L)	1/28/2013	5/2/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

Pond

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

DRAWN BY: ESS  
 DATE: 5/17/2013

**Facility Diagram**  
 PDC Energy – DJ Basin  
 Capehart 1, 31, 42-29  
 SWNE S29 T6N R64W  
 Weld County, CO



6899 Pecos Street  
 Unit C  
 Denver, CO 80221

- LEGEND
- Earthen Berm
  - Temporary Monitoring Well
  - Groundwater Sample Collected During Excavation Activities
  - Surface Water Sample Collected During Excavation Activities
  - Quarterly Monitoring Surface Water Sample Location

FIGURE 2  
 GROUNDWATER ANALYTICAL RESULTS  
 Not to Scale

**ATTACHMENT A**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 10, 2013

Brandon Bruns  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Cape Hart 1,31,42-29

Enclosed are the results of analyses for samples received by Summit Scientific on 05/03/13 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV  
Laboratory Director

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/10/13 14:44

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	R305043-01	Water	05/02/13 15:40	05/03/13 17:30
BH02	R305043-02	Water	05/02/13 15:45	05/03/13 17:30
BH03	R305043-03	Water	05/02/13 15:55	05/03/13 17:30
SURFACE	R305043-04	Water	05/02/13 16:00	05/03/13 17:30

Summit Scientific

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
 Project Manager: Brandon Bruns

Reported:  
 05/10/13 14:44

B305043

# Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401  
 303-277-9910 • 303-374-5933 Fax

Client: PDC/Tasmania Page 1 of 1

Address: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_  
 Project Manager: Brandon Bruns  
 E-Mail: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Project Name: Cape Hart 1,31,42-29  
 Fax: \_\_\_\_\_  
 Sampler Name: Brad M. J. J. J.  
 Project Number: \_\_\_\_\_

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative					Matrix			Analyze For:	Special Instructions	
				K	HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #			Other (Specify)
BH01	5/2/13	15:40	3	X										
BH02	5/2/13	15:45	3											
BH03	5/2/13	15:58	3											
SURFACE	5/2/13	16:00	3											

Requisitioned by: <u>M. J. J.</u>	Date/Time: <u>5/2/13 15:40</u>	Received by: <u>ABL</u>	Date/Time: <u>5/2/13 16:00</u>	Turn Around Time (Check): <input type="checkbox"/> 72 Hours <input checked="" type="checkbox"/> Standard	Notes:
Requisitioned by: <u>ABL</u>	Date/Time: <u>5/2/13 16:00</u>	Received by: <u>ABL</u>	Date/Time: <u>5/2/13 17:23</u>	Sample Integrity: <u>5-0</u>	
Requisitioned by: _____	Date/Time: _____	Received in Lab by: _____	Date/Time: _____	Temperature upon Receipt: _____	Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

www.sscientific.com



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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 05/10/13 14:44

**BH01**  
**R305043-01 (Water)**

**Summit Scientific**

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

Date Sampled: **05/02/13 15:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3050810	05/10/13	05/10/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/02/13 15:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		90.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		94.7 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.8 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 05/10/13 14:44

**BH02**  
**R305043-02 (Water)**

**Summit Scientific**

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

Date Sampled: **05/02/13 15:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3050810	05/10/13	05/10/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/02/13 15:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		93.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.2 %	45-146		"	"	"	"	

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 05/10/13 14:44

**BH03**  
**R305043-03 (Water)**

**Summit Scientific**

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

Date Sampled: **05/02/13 15:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3050810	05/10/13	05/10/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/02/13 15:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		79.4 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		94.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.8 %	45-146		"	"	"	"	

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 05/10/13 14:44

**SURFACE**  
**R305043-04 (Water)**

**Summit Scientific**

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

Date Sampled: **05/02/13 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3050810	05/10/13	05/10/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/02/13 16:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		91.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		94.8 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.0 %	45-146		"	"	"	"	

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
05/10/13 14:44

**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 3050810 - EPA 5030 Water MS**

**Blank (3050810-BLK1)**

Prepared & Analyzed: 05/08/13

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>13.2</i>		<i>"</i>	<i>13.2</i>		<i>99.4</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.8</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.3</i>	<i>45-146</i>			

**LCS (3050810-BS1)**

Prepared & Analyzed: 05/08/13

Benzene	49.0	1.0	ug/l	50.0		98.0	51-132			
Toluene	48.6	1.0	"	50.0		97.2	51-138			
Ethylbenzene	51.9	1.0	"	50.0		104	58-146			
m,p-Xylene	103	2.0	"	100		103	57-144			
o-Xylene	51.3	1.0	"	50.0		103	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.8</i>		<i>"</i>	<i>13.2</i>		<i>96.6</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.2</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.7</i>		<i>"</i>	<i>13.3</i>		<i>95.4</i>	<i>45-146</i>			

**LCS Dup (3050810-BSD1)**

Prepared & Analyzed: 05/08/13

Benzene	48.3	1.0	ug/l	50.0		96.6	51-132	1.46	17	
Toluene	48.2	1.0	"	50.0		96.3	51-138	0.868	17	
Ethylbenzene	50.6	1.0	"	50.0		101	58-146	2.40	16	
m,p-Xylene	102	2.0	"	100		102	57-144	1.60	16	
o-Xylene	50.5	1.0	"	50.0		101	53-146	1.57	15	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.5</i>		<i>"</i>	<i>13.2</i>		<i>94.4</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.8</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.5</i>		<i>"</i>	<i>13.3</i>		<i>93.5</i>	<i>45-146</i>			

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
 Project Manager: Brandon Brunns

Reported:  
 05/10/13 14:44

**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 3050810 - EPA 5030 Water MS**

<b>Matrix Spike (3050810-MS1)</b>	<b>Source: R305027-01</b>			<b>Prepared &amp; Analyzed: 05/08/13</b>						
Benzene	48.3	1.0	ug/l	50.0	ND	96.6	34-141			
Toluene	47.4	1.0	"	50.0	ND	94.9	27-151			
Ethylbenzene	50.2	1.0	"	50.0	ND	100	29-160			
m,p-Xylene	101	2.0	"	100	ND	101	20-166			
o-Xylene	50.0	1.0	"	50.0	ND	100	33-159			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.5</i>		<i>"</i>	<i>13.2</i>		<i>94.2</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.3</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.4</i>		<i>"</i>	<i>13.3</i>		<i>93.4</i>	<i>45-146</i>			

<b>Matrix Spike Dup (3050810-MSD1)</b>	<b>Source: R305027-01</b>			<b>Prepared &amp; Analyzed: 05/08/13</b>						
Benzene	49.6	1.0	ug/l	50.0	ND	99.3	34-141	2.74	32	
Toluene	49.2	1.0	"	50.0	ND	98.4	27-151	3.66	25	
Ethylbenzene	51.8	1.0	"	50.0	ND	104	29-160	3.28	50	
m,p-Xylene	104	2.0	"	100	ND	104	20-166	3.51	36	
o-Xylene	51.9	1.0	"	50.0	ND	104	33-159	3.75	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.6</i>		<i>"</i>	<i>13.2</i>		<i>95.1</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.3</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>96.8</i>	<i>45-146</i>			

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

Project: Cape Hart 1,31,42-29

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
05/10/13 14:44

### 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