



PDC Energy, Inc.
Second Quarter 2016 Groundwater Monitoring Summary

May 2, 2016

Ryan 23-25U & 25BU, 14-25U / Scott 24-25U / MVS #1 Tank Battery
SESW Section 25 T5N R68W
Larimer County, API # 05-069-06179
Facility ID # 307148
Remediation # 7239

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the Ryan 23-25U & 25BU, 14-25U/ Scott 24-25U/ MVS #1 tank battery. On April 13, 2016, groundwater sampling was conducted at five temporary monitoring well locations (BH01, BH02R – BH05R). Groundwater samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using USEPA Method 8260B. Analytical results are summarized in Table 1, and the laboratory report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Second quarter 2016 analytical results indicate that BTEX concentrations are below applicable COGCC Table 910-1 groundwater standards in all five sample locations.

Tasman conducted enhanced fluid recovery (EFR) and air sparge (AS) events between second quarter 2012 and second quarter 2013. EFR/AS activities were discontinued in the third quarter 2013 due to decreased groundwater levels on site. A summary of EFR/AS operational data is provided in Table 2. Monitored natural attenuation (MNA) was selected as the remediation strategy in third quarter 2013 and will continue through the third quarter 2016.

Pending land owner approval, additional monitoring wells will be installed to the north, east, and southwest of the current monitoring well network to establish up-, cross-, and down-gradient point of compliance.

Third quarter 2016 groundwater sampling will be conducted during July 2016.

TABLE 1
RYAN 23-25U, 25BU, 14-25U/SCOTT 24-25U/MVS 1 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
GW01-BH01	4/13/2012	320	810	44	490	NM
BH01	7/17/2012	<1.0	<1.0	<1.0	<1.0	14.39
BH01	10/1/2012	<1.0	<1.0	<1.0	<1.0	14.67
BH01	1/28/2013	<1.0	<1.0	<1.0	<1.0	14.90
BH01	5/3/2013	<1.0	<1.0	<1.0	<1.0	15.50
BH01	7/25/2013	<1.0	<1.0	<1.0	<1.0	16.29
BH01	10/31/2013	<1.0	<1.0	<1.0	<1.0	15.90
BH01	1/24/2014	<1.0	<1.0	<1.0	<1.0	15.53
BH01	4/28/2014	<1.0	<1.0	<1.0	<1.0	15.26
BH01	7/25/2014	<1.0	<1.0	<1.0	<1.0	15.59
BH01	10/22/2014	<1.0	<1.0	<1.0	<1.0	16.25
BH01	1/13/2015	<1.0	<1.0	<1.0	<1.0	15.00
BH01	4/9/2015	<1.0	<1.0	<1.0	<1.0	15.38
BH01	7/27/2015	<1.0	<1.0	<1.0	<1.0	16.01
BH01	10/5/2015	<1.0	<1.0	<1.0	<1.0	16.53
BH01	1/4/2016	<1.0	<1.0	<1.0	<1.0	16.68
BH01	4/13/2016	<1.0	<1.0	<1.0	<1.0	15.77
GW02-BH02	4/13/2012	7,100	14,000	420	4,400	NM
BH02	7/17/2012	DRY	DRY	DRY	DRY	DRY
BH02	10/1/2012	DRY	DRY	DRY	DRY	DRY
BH02	1/28/2013	DRY	DRY	DRY	DRY	DRY
BH02	5/3/2013	DRY	DRY	DRY	DRY	DRY
BH02	7/25/2013	DRY	DRY	DRY	DRY	DRY
BH02	10/31/2013	DRY	DRY	DRY	DRY	DRY
BH02	1/24/2014	DRY	DRY	DRY	DRY	DRY
BH02R	4/28/2014	1.0	<1.0	<1.0	<1.0	17.06
BH02R	7/25/2014	<1.0	<1.0	<1.0	<1.0	17.38
BH02R	10/22/2014	<1.0	<1.0	<1.0	<1.0	17.01
BH02R	1/13/2015	<1.0	<1.0	<1.0	<1.0	16.74
BH02R	4/9/2015	<1.0	<1.0	<1.0	<1.0	17.13
BH02R	7/27/2015	<1.0	<1.0	<1.0	<1.0	18.05
BH02R	10/5/2015	<1.0	<1.0	<1.0	<1.0	18.66

TABLE 1
RYAN 23-25U, 25BU, 14-25U/SCOTT 24-25U/MVS 1 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
BH02R	1/4/2016	<1.0	<1.0	<1.0	2.3	18.58
BH02R	4/13/2016	<1.0	<1.0	<1.0	<1.0	17.68
<hr/>						
GW03-BH03	4/13/2012	11,000	13,000	300	3,500	NM
BH03	7/17/2012	1,400	710	20	250	13.82
BH03	10/1/2012	41	47	3.0	32	14.20
BH03	1/28/2013	DRY	DRY	DRY	DRY	DRY
BH03	5/3/2013	<1.0	<1.0	<1.0	<1.0	14.81
BH03	7/25/2013	DRY	DRY	DRY	DRY	DRY
BH03	10/31/2013	DRY	DRY	DRY	DRY	DRY
BH03	1/24/2014	<1.0	<1.0	<1.0	<1.0	14.82
<hr/>						
BH03R	7/25/2014	3.4	<1.0	<1.0	<1.0	15.43
BH03R	10/22/2014	7.3	<1.0	1.2	<1.0	15.40
BH03R	4/28/2014	<1.0	<1.0	<1.0	<1.0	16.08
BH03R	7/25/2014	3.4	<1.0	<1.0	<1.0	15.43
BH03R	10/22/2014	7.3	<1.0	1.2	<1.0	15.40
BH03R	1/13/2015	<1.0	<1.0	1.3	<1.0	15.15
BH03R	4/9/2015	<1.0	<1.0	<1.0	<1.0	15.47
BH03R	7/27/2015	<1.0	<1.0	<1.0	<1.0	16.21
BH03R	10/5/2015	<1.0	<1.0	<1.0	<1.0	16.41
BH03R	1/4/2016	<1.0	<1.0	<1.0	<1.0	16.71
BH03R	4/13/2016	<1.0	<1.0	<1.0	<1.0	15.65
<hr/>						
GW04-BH04	4/13/2012	3,100	3,900	150	1,700	NM
BH04	7/17/2012	1,500	490	<1.0	1,900	13.21
BH04	10/1/2012	2,400	66	53	1,800	13.58
<hr/>						
BH04R	1/28/2013	26	<1.0	<1.0	77	14.53
BH04R	5/3/2013	<1.0	<1.0	<1.0	<1.0	15.22
BH04R	7/25/2013	2.0	<1.0	<1.0	<1.0	16.12
BH04R	10/31/2013	<1.0	<1.0	4.1	<1.0	15.77
BH04R	1/24/2014	<1.0	<1.0	3.3	<1.0	15.24
BH04R	4/28/2014	<1.0	<1.0	4.1	<1.0	15.03
BH04R	7/25/2014	<1.0	<1.0	1.1	<1.0	15.17
BH04R	10/22/2014	13	<1.0	<1.0	<1.0	15.01

TABLE 1
RYAN 23-25U, 25BU, 14-25U/SCOTT 24-25U/MVS 1 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
BH04R	1/13/2015	2.4	<1.0	1.5	4.0	14.81
BH04R	4/9/2015	1.7	<1.0	1.5	7.4	15.11
BH04R	7/27/2015	130	<1.0	1.0	18	15.73
BH04R	8/4/2015	76	<1.0	3.1	46	16.07
BH04R	10/5/2015	25	<1.0	15	45	15.99
BH04R	1/4/2016	13	<1.0	10	56	16.49
BH04R	4/13/2016	2.1	<1.0	<1.0	<1.0	15.48
<hr/>						
GW05-BH05	4/13/2012	510	3,400	190	2,200	NM
BH05	7/17/2012	<1.0	<1.0	<1.0	<1.0	13.30
BH05	10/1/2012	<1.0	<1.0	<1.0	<1.0	15.60
BH05	1/28/2013	<1.0	<1.0	<1.0	<1.0	15.74
BH05	5/3/2013	<1.0	<1.0	<1.0	<1.0	16.45
BH05	7/25/2013	DRY	DRY	DRY	DRY	DRY
BH05	8/31/2013	DRY	DRY	DRY	DRY	DRY
BH05	10/31/2013	DRY	DRY	DRY	DRY	DRY
BH05	1/24/2014	<1.0	<1.0	<1.0	<1.0	16.49
<hr/>						
BH05R	4/28/2014	<1.0	<1.0	<1.0	<1.0	15.89
BH05R	7/25/2014	<1.0	<1.0	<1.0	<1.0	16.15
BH05R	10/22/2014	<1.0	<1.0	<1.0	<1.0	15.90
BH05R	1/13/2015	<1.0	<1.0	<1.0	<1.0	15.65
BH05R	4/9/2015	<1.0	<1.0	<1.0	<1.0	15.94
BH05R	7/27/2015	<1.0	<1.0	<1.0	<1.0	16.80
BH05R	10/5/2015	<1.0	<1.0	<1.0	<1.0	17.22
BH05R	1/4/2016	<1.0	<1.0	<1.0	<1.0	17.39
BH05R	4/13/2016	<1.0	<1.0	<1.0	<1.0	16.44

Notes:

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective March 16, 2016.

2. Depth to water measured from top of well casing

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

(<) = Analytical result is less than the indicated laboratory reporting limit.

DRY = Well contained insufficient volume to collect sample.

NM = Not Measured

BOLD = Analytical result is in exceedance of COGCC groundwater standards.

TABLE 2
RYAN 23-25U, 25BU, 14-25U/SCOTT 24-25U/MVS 1 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)
Second Quarter 2012					
5/29/2012	BH01, BH02, BH03,	6	210	BH01, BH02, BH03,	8
6/13/2012	BH04, BH05	6	210	BH04, BH05	8
Quarterly Totals		12	420		-
Third Quarter 2012					
7/2/2012	BH01, BH02, BH03, BH04, BH05	6	252	BH01, BH02, BH03, BH04, BH05	8
7/10/2012		6	210		8
7/25/2012		6	207		8
8/18/2012		7	124.5		7.5
8/21/2012		8	124.5		8
9/4/2012		7	0		8
Quarterly Totals		40	918		-
Fourth Quarter 2012					
10/3/2012	BH01, BH02, BH03, BH04, BH05	7	83	BH01, BH02, BH03, BH04, BH05	8
10/30/2012		6	11.5		8
11/13/2012		6	23		8
11/29/2012		6.5	14.6		8
12/6/2012		6.5	7.5		8
Quarterly Totals		32	139.6		-
First Quarter 2013					
1/7/2013	BH01, BH03, BH05	4.5	10	BH01, BH03, BH04	10
3/25/2013	BH03, BH04, BH05	6	26	BH03, BH04, BH05	10
Quarterly Totals		10.5	36		
Second Quarter 2013					
4/14/2013	BH03, BH04, BH05	6	23.5	BH03, BH04, BH05	10
4/25/2013		6	16		10
5/10/2013	BH03, BH04R	6	22	BH03, BH04R	10
Quarterly Totals		18	61.5		

Notes:

EFR = Enhanced fluid recovery

AS = Air sparge

psi = Pounds per square inch



BH03R		
Compound (µg/L)	1/4/2016	4/13/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

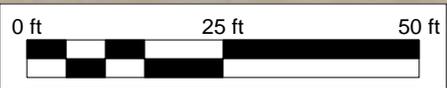
BH04R		
Compound (µg/L)	1/4/2016	4/13/2016
Benzene	13	2.1
Toluene	<1.0	<1.0
Ethylbenzene	10	<1.0
Total Xylenes	56	<1.0

BH05R		
Compound (µg/L)	1/4/2016	4/13/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH01		
Compound (µg/L)	1/4/2016	4/13/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH02R		
Compound (µg/L)	1/4/2016	4/13/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	2.3	<1.0

Surface
Drainage



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

DRAWN BY: ESS
DATE: 4/21/2016

Facility Diagram
PDC Energy – DJ Basin
Ryan 23-25U & 25BU, 14-25U/ Scott 24-25U/ MVS #1
Tank Battery
SESW S25 T5N R68W
Larimer County, CO

TASMAN
GEOSCIENCES
6899 Pecos St., Unit C
Denver CO 80221

LEGEND

- Excavation Extent
- Monitoring Well Location
- Monitoring Well Location – Well Destroyed
- Point of Release
- Groundwater Flow Direction

All locations are approximate unless otherwise noted

FIGURE 1
GROUNDWATER ANALYTICAL RESULTS MAP

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

April 18, 2016

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Enclosed are the results of analyses for samples received by Summit Scientific on 04/13/16 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury

President



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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/18/16 14:29

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1604088-01	Water	04/13/16 12:05	04/13/16 17:00
BH02R	1604088-02	Water	04/13/16 12:11	04/13/16 17:00
BH03R	1604088-03	Water	04/13/16 12:34	04/13/16 17:00
BH04R	1604088-04	Water	04/13/16 12:24	04/13/16 17:00
BH05R	1604088-05	Water	04/13/16 12:18	04/13/16 17:00

Summit Scientific

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



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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/18/16 14:29

Summit Scientific

1604088

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client: PDC Energy
 Address: _____
 City/State/Zip: _____
 Phone: _____ Fax: _____
 Sampler Name: Kate Forsmoek
 Project Manager: Mark Longhurst
 E-Mail: mark.longhurst@pdce.com
 Project Name: Ryan 23-25U & 25BU / Scott 24-25U / MVS #1
 Project Number: _____

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)	BTEX 6260				
RHD1	4/13/16	1205	3	X												
BH02R	4/13/16	1211	3	X				X								
BH03R	4/13/16	1234	3	X				X								
BH04R	4/13/16	1224	3	X				X								
BH05R	4/13/16	1218	3	X				X								
Relinquished by: <u>Kate</u> Date/Time: <u>4/13/16 1700</u>				Received by: <u>ms</u> Date/Time: <u>4/13/16 1700</u>				Turn Around Time (Check)				Notes:				
Relinquished by: <u>ms</u> Date/Time: <u>4/13/16 1745</u>				Received in Lab by: <u>ms</u> Date/Time: <u>4-13-16 1745</u>				Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>				on ice				
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				Sample Integrity:								
								Temperature Upon Receipt: <u>4.8°C</u>								
								Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								

www.s2scientific.com



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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/18/16 14:29

Sample Receipt Checklist

S2 Work Order: ~~PDC~~ 1604088

Client: PDC Energy Client Project ID: Ryan 23-25U & 25BU/Scott 24-25U MVS #1

Shipped Via: PV (UPS, FedEx, Hand Delivered, Pick-up, etc.) Airbill #: _____

Matrix (check all that apply): Air Soil/Solid Water Other: _____

Cooler ID					(Describe)
Temp (°C)	4.8°C				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?	✓			
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	✓			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		✓		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?	✓			
Note the type of preservative in the Comments column – (HCl/H2SO4, NaOH, HNO3, ect)				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			✓	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

Mindy Mach
Custodian Printed Name

[Signature]
Signature or Initials of Custodian

4/15/16 9:44
Date/Time



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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/18/16 14:29

BH01
1604088-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/13/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1604149	04/14/16	04/14/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/13/16 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		105 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		107 %	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.



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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/18/16 14:29

BH02R
1604088-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/13/16 12:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1604149	04/14/16	04/14/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/13/16 12:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		94.1 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/18/16 14:29

BH03R
1604088-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/13/16 12:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1604149	04/14/16	04/14/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/13/16 12:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		97.8 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		105 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		107 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/18/16 14:29

BH04R
1604088-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/13/16 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	2.1	1.0	ug/l	1	1604149	04/14/16	04/14/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/13/16 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		95.6 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		103 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		105 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/18/16 14:29

BH05R
1604088-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/13/16 12:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1604149	04/14/16	04/14/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **04/13/16 12:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		96.2 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		109 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/18/16 14:29

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 1604149 - EPA 5030 Water MS

Blank (1604149-BLK1)

Prepared & Analyzed: 04/14/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.3		97.4	37-154			
Surrogate: Toluene-d8	13.9		"	13.3		104	45-149			
Surrogate: 4-Bromofluorobenzene	14.2		"	13.3		107	45-146			

LCS (1604149-BS1)

Prepared & Analyzed: 04/14/16

Benzene	33.0	1.0	ug/l	33.3		98.9	51-132			
Toluene	32.0	1.0	"	33.3		96.1	51-138			
Ethylbenzene	35.0	1.0	"	33.1		106	58-146			
m,p-Xylene	72.5	2.0	"	66.5		109	57-144			
o-Xylene	34.1	1.0	"	32.7		105	53-146			
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.3		96.5	37-154			
Surrogate: Toluene-d8	13.8		"	13.3		103	45-149			
Surrogate: 4-Bromofluorobenzene	14.3		"	13.3		107	45-146			

Matrix Spike (1604149-MS1)

Source: 1604088-01

Prepared & Analyzed: 04/14/16

Benzene	33.2	1.0	ug/l	33.3	ND	99.6	34-141			
Toluene	32.4	1.0	"	33.3	ND	97.1	27-151			
Ethylbenzene	35.2	1.0	"	33.1	ND	106	29-160			
m,p-Xylene	72.6	2.0	"	66.5	ND	109	20-166			
o-Xylene	34.0	1.0	"	32.7	ND	104	33-159			
Surrogate: 1,2-Dichloroethane-d4	12.7		"	13.3		95.3	37-154			
Surrogate: Toluene-d8	13.7		"	13.3		103	45-149			
Surrogate: 4-Bromofluorobenzene	14.1		"	13.3		105	45-146			

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 Denver CO, 80203

Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/18/16 14:29

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 1604149 - EPA 5030 Water MS

Matrix Spike Dup (1604149-MSD1)	Source: 1604088-01			Prepared & Analyzed: 04/14/16						
Benzene	32.9	1.0	ug/l	33.3	ND	98.6	34-141	0.999	32	
Toluene	32.2	1.0	"	33.3	ND	96.7	27-151	0.434	25	
Ethylbenzene	34.4	1.0	"	33.1	ND	104	29-160	2.27	50	
m,p-Xylene	70.8	2.0	"	66.5	ND	106	20-166	2.58	36	
o-Xylene	33.7	1.0	"	32.7	ND	103	33-159	0.974	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.9</i>		<i>"</i>	<i>13.3</i>		<i>104</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>14.0</i>		<i>"</i>	<i>13.3</i>		<i>105</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.4</i>		<i>"</i>	<i>13.3</i>		<i>108</i>	<i>45-146</i>			

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Project: Ryan 23-25U & 25BU,14-25U/Scott 24-25U/MVS #1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/18/16 14:29

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

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