

Project: 4071
Document #: 2211007
Date: 01/22/2016



PDC Energy, Inc.
Fourth Quarter 2014 Groundwater Monitoring Summary

December 23, 2014

Wiedeman 21B, 24-21, 21-2 Tank Battery
NESW S21 T5N R67W
Weld County, API # 05-123-11427

This groundwater summary has been prepared by Tasman Geosciences, LLC for the Wiedeman 21B, 24-21, 21-2 tank battery. On November 26, 2014, groundwater sampling was conducted at five monitoring well locations. Groundwater samples were submitted for laboratory analysis of BTEX constituents using USEPA Method 8260B. Analytical results are summarized in Table 1 below and are illustrated on Figure 1. The laboratory analytical report is included as Attachment A. Evaluation of fourth quarter analytical results indicates that benzene concentrations are below COGCC regulatory standards at the five sample locations.

Monitored natural attenuation will remain the selected remedial strategy through the first quarter 2015.

First quarter 2015 groundwater sampling will be conducted during February 2015.

TABLE 1
WIEDEMAN 21B, 24-21, 21-2
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	6/29/2007	180	15	<1.0	740	NM
MW01	8/17/2007	210	<1.0	91	360	6.19
MW01	2/21/2008	30	<1.0	14	<1.0	12.65
MW01	5/6/2008	22	<1.0	<1.0	<1.0	12.72
MW01	8/27/2008	500	<1.0	110	290	6.68
MW01	11/12/2008	50	<1.0	63	180	9.63
MW01	2/9/2009	12	<1.0	5.1	3.1	11.90
MW01	5/8/2009	130	<1.0	18	6.5	10.98
MW01	8/28/2009	70	<1.0	77	81	6.18
MW01	11/11/2009	800	<1.0	71	210	9.06
MW01	2/25/2010	13	<1.0	2.1	5	11.70
MW01	5/18/2010	200	<1.0	48	100	NM
MW01	8/11/2010	310	<1.0	110	180	5.90
MW01	11/10/2010	10	<1.0	15	20	10.30
MW01	2/24/2011	33	<1.0	4.6	12	12.62
MW01	5/5/2011	17	<1.0	1.4	<1.0	NM
MW01	8/2/2011	170	<1.0	100	200	5.64
MW01	11/30/2011	7.2	<1.0	2.2	2.3	8.80
MW01	2/21/2012	200	<1.0	82	210	10.61
MW01	5/29/2012	180	<1.0	120	350	9.37
MW01	5/23/2013	NS	NS	NS	NS	DRY
MW01	8/27/2013	22	<1.0	2.6	3.4	4.24
MW01	11/26/2013	<1.0	<1.0	<1.0	<1.0	7.12
MW01	2/20/2014	7.3	<1.0	3.1	4.3	8.61
MW01	5/30/2014	18	<1.0	17	6.5	6.19
MW01	8/18/2014	18	<1.0	9.0	4.7	2.92
MW01	11/26/2014	<1.0	<1.0	<1.0	<1.0	7.00
MW02	8/17/2007	<1.0	<1.0	<1.0	<1.0	5.43
MW02	2/21/2008	7.4	<1.0	1.1	<1.0	12.20
MW02	5/6/2008	1.4	<1.0	<1.0	<1.0	12.47
MW02	8/27/2008	12	<1.0	1.6	<1.0	6.12
MW02	11/12/2008	59	<1.0	38	<1.0	9.38
MW02	2/9/2009	12	<1.0	10	<1.0	11.60
MW02	5/8/2009	8.2	<1.0	4.2	<1.0	10.42
MW02	8/28/2009	5.5	<1.0	<1.0	<1.0	5.53
MW02	11/11/2009	22	<1.0	37	<1.0	8.72
MW02	2/25/2010	<1.0	<1.0	1.3	<1.0	11.35

TABLE 1
WIEDEMAN 21B, 24-21, 21-2
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)
MW02	8/11/2010	<1.0	<1.0	<1.0	<1.0	5.26
MW02	11/10/2010	<1.0	<1.0	<1.0	<1.0	10.00
MW02	2/24/2011	<1.0	<1.0	<1.0	<1.0	12.22
MW02	5/5/2011	<1.0	<1.0	<1.0	<1.0	NM
MW02	8/2/2011	<1.0	<1.0	<1.0	<1.0	4.84
MW02	11/30/2011	<1.0	<1.0	5.9	<1.0	7.64
MW02	2/21/2012	1.1	<1.0	14	<1.0	10.23
MW02	5/29/2012	<1.0	<1.0	18	<1.0	8.84
MW02	5/23/2013	4.5	<1.0	20	74	11.83
MW02	8/27/2013	4.6	<1.0	13	11	5.77
MW02	11/26/2013	1.1	<1.0	<1.0	<1.0	8.86
MW02	2/20/2014	<1.0	<1.0	<1.0	<1.0	10.44
MW02	5/30/2014	<1.0	<1.0	<1.0	<1.0	7.90
MW02	8/18/2014	<1.0	<1.0	<1.0	<1.0	4.58
MW02	11/26/2014	1.1	<1.0	1.4	<1.0	8.85
MW03	8/17/2007	<1.0	<1.0	<1.0	<1.0	6.23
MW03	2/21/2008	<1.0	<1.0	<1.0	<1.0	13.08
MW03	5/6/2008	<1.0	<1.0	<1.0	<1.0	13.68
MW03	8/27/2008	<1.0	<1.0	<1.0	<1.0	7.10
MW03	11/12/2008	<1.0	<1.0	<1.0	<1.0	10.64
MW03	2/9/2009	<1.0	<1.0	<1.0	<1.0	12.84
MW03	5/8/2009	<1.0	<1.0	<1.0	<1.0	11.76
MW03	8/28/2009	<1.0	<1.0	<1.0	<1.0	6.51
MW03	11/11/2009	<1.0	<1.0	<1.0	<1.0	10.01
MW03	2/25/2010	<1.0	<1.0	<1.0	<1.0	12.55
MW03	5/18/2010	<1.0	<1.0	<1.0	<1.0	NM
MW03	8/11/2010	<1.0	<1.0	<1.0	<1.0	6.20
MW03	11/10/2010	<1.0	<1.0	<1.0	<1.0	11.23
MW03	2/24/2011	<1.0	<1.0	<1.0	<1.0	13.44
MW03	5/5/2011	<1.0	<1.0	<1.0	<1.0	NM
MW03	8/2/2011	<1.0	<1.0	<1.0	<1.0	13.82
MW03	11/30/2011	<1.0	<1.0	<1.0	<1.0	8.80
MW03	2/21/2012	<1.0	<1.0	<1.0	<1.0	11.49
MW03	5/29/2012	1.5	2.4	<1.0	<1.0	9.79
MW03	5/23/2013	<1.0	<1.0	<1.0	<1.0	13.00
MW03	8/27/2013	<1.0	<1.0	<1.0	<1.0	6.70
MW03	11/26/2013	<1.0	<1.0	<1.0	<1.0	9.97
MW03	2/20/2014	<1.0	<1.0	<1.0	<1.0	11.55

TABLE 1
WIEDEMAN 21B, 24-21, 21-2
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)
MW03	5/30/2014	<1.0	<1.0	<1.0	<1.0	8.72
MW03	8/18/2014	<1.0	<1.0	<1.0	<1.0	5.63
MW03	11/26/2014	<1.0	<1.0	<1.0	<1.0	10.03
MW04	2/21/2008	<1.0	<1.0	<1.0	<1.0	13.20
MW04	5/6/2008	<1.0	<1.0	<1.0	<1.0	13.38
MW04	8/27/2008	<1.0	<1.0	<1.0	<1.0	NM
MW04	11/12/2008	<1.0	<1.0	<1.0	<1.0	NM
MW04	2/9/2009	<1.0	<1.0	<1.0	<1.0	NM
MW04	5/8/2009	<1.0	<1.0	<1.0	<1.0	NM
MW04	11/11/2009	<1.0	<1.0	<1.0	<1.0	NM
MW04	2/25/2010	<1.0	<1.0	<1.0	<1.0	0.00
MW04	5/18/2010	<1.0	<1.0	<1.0	<1.0	NM
MW04	8/11/2010	<1.0	<1.0	<1.0	<1.0	7.54
MW04	11/10/2010	<1.0	<1.0	<1.0	<1.0	10.61
MW04	2/24/2011	<1.0	<1.0	<1.0	<1.0	NM
MW04	5/5/2011	<1.0	<1.0	<1.0	<1.0	NM
MW04	8/2/2011	<1.0	<1.0	<1.0	<1.0	7.14
MW04	11/30/2011	<1.0	<1.0	<1.0	<1.0	8.50
MW04	2/21/2012	<1.0	<1.0	<1.0	<1.0	10.92
MW04	5/29/2012	<1.0	<1.0	<1.0	<1.0	10.76
MW04	5/23/2013	<1.0	<1.0	<1.0	<1.0	12.48
MW04	8/27/2013	<1.0	<1.0	<1.0	<1.0	7.67
MW04	11/26/2013	<1.0	<1.0	<1.0	<1.0	9.36
MW04	2/20/2014	<1.0	<1.0	<1.0	<1.0	11.07
MW04	5/30/2014	<1.0	<1.0	<1.0	<1.0	9.96
MW04	8/18/2014	<1.0	<1.0	<1.0	<1.0	5.69
MW04	11/26/2014	<1.0	<1.0	<1.0	<1.0	9.46
MW05	2/21/2008	<1.0	<1.0	<1.0	<1.0	13.10
MW05	5/6/2008	<1.0	<1.0	<1.0	<1.0	13.24
MW05	8/27/2008	<1.0	<1.0	<1.0	<1.0	7.17
MW05	11/12/2008	<1.0	<1.0	<1.0	<1.0	9.86
MW05	2/9/2009	<1.0	<1.0	<1.0	<1.0	12.20
MW05	5/8/2009	<1.0	<1.0	<1.0	<1.0	11.30
MW05	8/28/2009	<1.0	<1.0	<1.0	<1.0	6.83
MW05	11/11/2009	<1.0	<1.0	<1.0	<1.0	9.31
MW05	2/25/2010	<1.0	<1.0	<1.0	<1.0	12.00
MW05	5/18/2010	<1.0	<1.0	<1.0	<1.0	NM
MW05	8/11/2010	<1.0	<1.0	<1.0	<1.0	6.58

TABLE 1
WIEDEMAN 21B, 24-21, 21-2
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)
MW05	2/24/2011	<1.0	<1.0	<1.0	<1.0	12.88
MW05	5/5/2011	<1.0	<1.0	<1.0	<1.0	NM
MW05	8/2/2011	<1.0	<1.0	<1.0	<1.0	6.12
MW05	11/30/2011	<1.0	<1.0	<1.0	<1.0	9.32
MW05	2/21/2012	<1.0	<1.0	<1.0	<1.0	10.95
MW05	5/29/2012	<1.0	<1.0	<1.0	<1.0	10.09
MW05	5/23/2013	<1.0	<1.0	<1.0	<1.0	12.52
MW05	8/27/2013	<1.0	<1.0	<1.0	<1.0	5.35
MW05	11/26/2013	<1.0	<1.0	<1.0	<1.0	7.60
MW05	2/20/2014	<1.0	<1.0	<1.0	<1.0	9.28
MW05	5/30/2014	<1.0	<1.0	<1.0	<1.0	7.58
MW05	8/18/2014	<1.0	<1.0	<1.0	<1.0	3.58
MW05	11/26/2014	<1.0	<1.0	<1.0	<1.0	7.66
COGCC standards for Groundwater (ug/L) ⁽¹⁾		5	560	700	1,400	

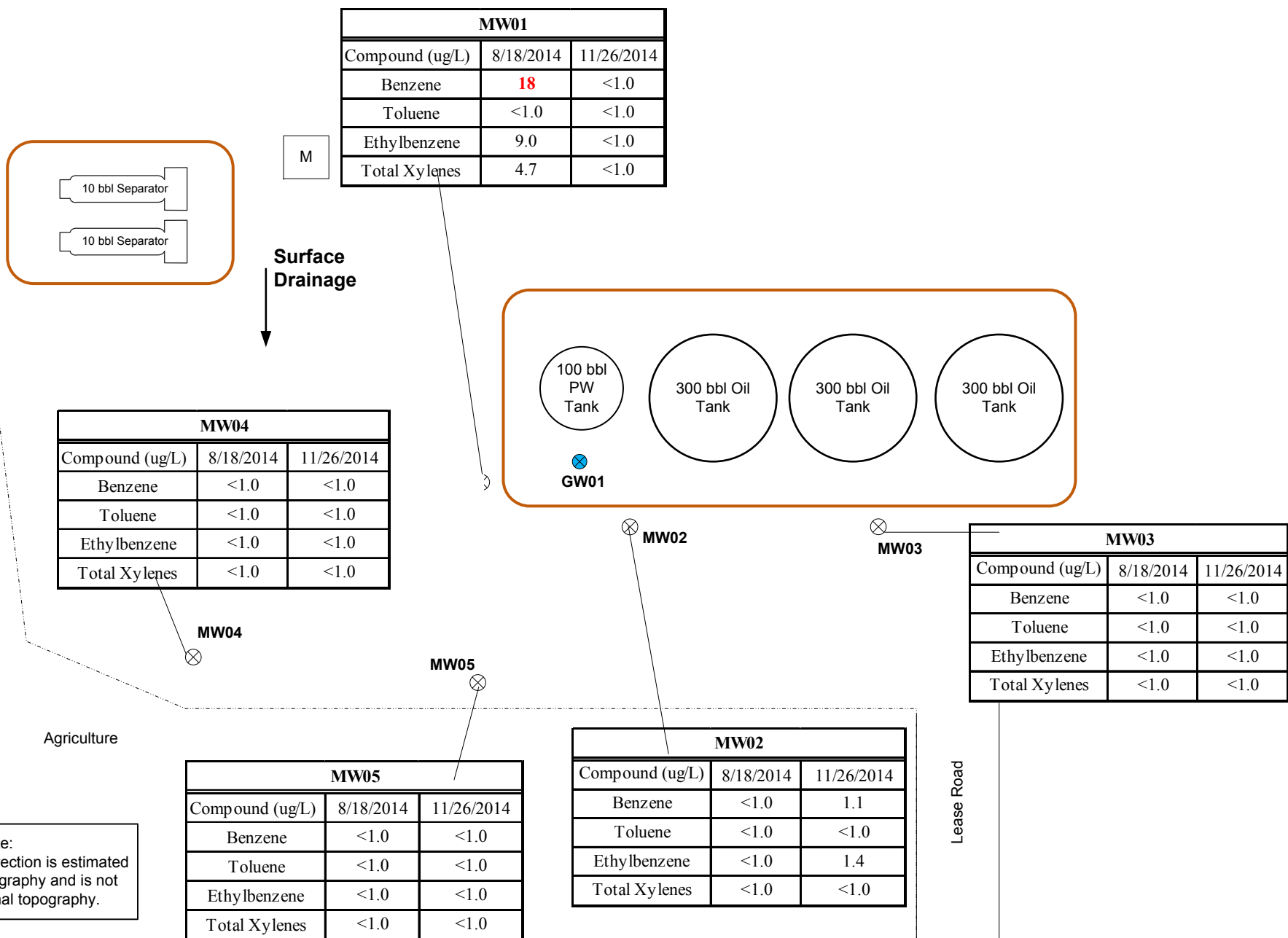
Notes:

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.

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

ug/L- Micrograms per liter

NM - Not Measured



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

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite J ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.374.5933 - fax

November 25, 2014

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Wiedeman 21B, 24-21, 21-1

Enclosed are the results of analyses for samples received by Summit Scientific on 11/20/14 15:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph J. Egry IV". The signature is fluid and cursive, with a large, stylized "E" and "I".

Joseph J Egry IV For Paul Shrewsbury
President

This report shall not be reproduced, except in its entirety, without the written approval of Summit Scientific. Test results relate only to samples analyzed.

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

Project: Wiedeman 21B, 24-21, 21-1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	1411151-01	Water	11/20/14 15:00	11/20/14 15:45
MW02	1411151-02	Water	11/20/14 15:05	11/20/14 15:45
MW03	1411151-03	Water	11/20/14 15:10	11/20/14 15:45
MW04	1411151-04	Water	11/20/14 15:15	11/20/14 15:45
MW05	1411151-05	Water	11/20/14 15:20	11/20/14 15:45

Summit Scientific

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Wiedeman 21B, 24-21, 21-1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

Summit Scientific

S₂

741 Corporate Circle, Suite J&K ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933

1411151

Client: PDC/Tasman Project Manager: Brandon Bruns Page 1 of 1
Address: _____ E-Mail: _____
City/State/Zip: _____
Phone: _____ Fax: _____ Project Name: Wiedeman 21B, 24-21, 21-1
Sampler Name: Eric Siegel Project Number: _____

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested				Special Instructions
					HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air-Canister #	Other (Specify)					
1	MW01	11/20/14	1500	3	X				X				X				
2	MW02		1505														
3	MW03		1510														
4	MW04		1515														
5	MW05	✓	1520														
6																	
7																	
8																	
9																	
10																	

Relinquished by: <u>E.A. Siegel</u> Date/Time: <u>11/20/14 15:45</u>	Received by: <u>[Signature]</u> Date/Time: <u>11/20/14 15:45</u>	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 hours <input type="checkbox"/>	Notes:
Relinquished by: _____ Date/Time: _____	Received by: _____ Date/Time: _____	Sample Integrity: Temperature Upon Receipt: <u>5.5</u> Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	
Relinquished by: _____ Date/Time: _____	Received by: _____ Date/Time: _____		

www.s2scientific.com

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

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 For Paul Shrewsbury, President



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

Project: Wiedeman 21B, 24-21, 21-1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

Sample Receipt Checklist

S2 Work Order: 141151

Client: PDC

Client Project ID: Wiedeman 21B, 24-21, 21-1

Shipped Via: Delivered
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)	<u>5.5</u>				

Thermometer ID: _____

	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.	<u>X</u>			
Were all samples received intact ⁽¹⁾ ?	<u>X</u>			
Was adequate sample volume provided ⁽¹⁾ ?	<u>X</u>			
If custody seals are present, are they intact ⁽¹⁾ ?			<u>X</u>	
Are short holding time analytes or samples with HTs due within 48 hours present?		<u>X</u>		
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<u>X</u>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<u>X</u>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<u>X</u>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<u>X</u>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		<u>✓</u>	<u>X</u>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?	<u>X</u>			<u>HCl</u>
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, etc.				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<u>X</u>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<u>X</u>	
Additional Comments (if any):				
⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.				

Aisha Oldham
Custodian Printed Name

BD
Signature or Initials of Custodian

11/22/14
Date/Time

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

Summit Scientific

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Wiedeman 21B, 24-21, 21-1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

MW01
1411151-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/20/14 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	16	1.0	ug/l	1	1411229	11/25/14	11/25/14 09:00	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	17	1.0	"	"	"	"	"	"	
Xylenes (total)	12	1.0	"	"	"	"	"	"	

Date Sampled: **11/20/14 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	96.3 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.0 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.6 %	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 For Paul Shrewsbury, President



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

Project: Wiedeman 21B, 24-21, 21-1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

MW02
1411151-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/20/14 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411229	11/25/14	11/25/14 09:24	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **11/20/14 15:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	101 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.1 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	45-146			"	"	"	"	

Summit Scientific

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Wiedeman 21B, 24-21, 21-1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

MW03
1411151-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/20/14 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411229	11/25/14	11/25/14 09:48	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **11/20/14 15:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	97.4 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	95.8 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	99.5 %	45-146			"	"	"	"	

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Wiedeman 21B, 24-21, 21-1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

MW04
1411151-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/20/14 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411229	11/25/14	11/25/14 10:12	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **11/20/14 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	96.4 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.7 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	45-146			"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

MW05
1411151-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/20/14 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1411229	11/25/14	11/25/14 10:36	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **11/20/14 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	97.5 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.1 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	45-146			"	"	"	"	

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Wiedeman 21B, 24-21, 21-1

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/25/14 16:29

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 1411229 - EPA 5030 Water MS

Blank (1411229-BLK1)

Prepared & Analyzed: 11/25/14

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.3		"	13.2		92.9	37-154			
Surrogate: Toluene-d8	12.6		"	13.3		94.5	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.1	45-146			

LCS (1411229-BS1)

Prepared & Analyzed: 11/25/14

Benzene	34.4	1.0	ug/l	33.3		103	51-132			
Toluene	34.4	1.0	"	33.3		103	51-138			
Ethylbenzene	37.0	1.0	"	33.1		112	58-146			
m,p-Xylene	70.9	2.0	"	66.5		107	57-144			
o-Xylene	35.2	1.0	"	32.8		107	53-146			
Surrogate: 1,2-Dichloroethane-d4	12.6		"	13.2		95.2	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.1	45-149			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		103	45-146			

LCS (1411229-BS2)

Prepared & Analyzed: 11/25/14

Benzene	34.6	1.0	ug/l	33.3		104	51-132			
Toluene	34.4	1.0	"	33.3		103	51-138			
Ethylbenzene	36.8	1.0	"	33.1		111	58-146			
m,p-Xylene	70.5	2.0	"	66.5		106	57-144			
o-Xylene	34.5	1.0	"	32.8		105	53-146			
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.2		97.6	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		98.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.2	45-146			

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

Project: Wiedeman 21B, 24-21, 21-1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

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 1411229 - EPA 5030 Water MS

Matrix Spike (1411229-MS1)		Source: 1411151-01			Prepared & Analyzed: 11/25/14					
Benzene	49.6	1.0	ug/l	33.3	16.0	101	34-141			
Toluene	33.6	1.0	"	33.3	ND	101	27-151			
Ethylbenzene	51.7	1.0	"	33.1	16.6	106	29-160			
m,p-Xylene	79.8	2.0	"	66.5	12.2	102	20-166			
o-Xylene	34.3	1.0	"	32.8	ND	105	33-159			
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.2		97.8	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		99.1	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.3	45-146			

Matrix Spike (1411229-MS2)		Source: 1411151-02			Prepared & Analyzed: 11/25/14					
Benzene	34.7	1.0	ug/l	33.3	ND	104	34-141			
Toluene	34.6	1.0	"	33.3	ND	104	27-151			
Ethylbenzene	36.7	1.0	"	33.1	ND	111	29-160			
m,p-Xylene	69.2	2.0	"	66.5	ND	104	20-166			
o-Xylene	34.4	1.0	"	32.8	ND	105	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.2		99.7	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		98.6	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		98.7	45-146			

Matrix Spike Dup (1411229-MSD1)		Source: 1411151-01			Prepared & Analyzed: 11/25/14					
Benzene	48.4	1.0	ug/l	33.3	16.0	97.0	34-141	2.57	32	
Toluene	33.7	1.0	"	33.3	ND	101	27-151	0.0594	25	
Ethylbenzene	50.8	1.0	"	33.1	16.6	103	29-160	1.80	50	
m,p-Xylene	79.6	2.0	"	66.5	12.2	101	20-166	0.263	36	
o-Xylene	34.4	1.0	"	32.8	ND	105	33-159	0.320	26	
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.2		98.0	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		98.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	45-146			

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

Project: Wiedeman 21B, 24-21, 21-1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/25/14 16:29

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 1411229 - EPA 5030 Water MS

Matrix Spike Dup (1411229-MSD2)	Source: 1411151-02			Prepared & Analyzed: 11/25/14						
Benzene	34.2	1.0	ug/l	33.3	ND	102	34-141	1.71	32	
Toluene	34.0	1.0	"	33.3	ND	102	27-151	1.72	25	
Ethylbenzene	36.8	1.0	"	33.1	ND	111	29-160	0.0544	50	
m,p-Xylene	69.9	2.0	"	66.5	ND	105	20-166	0.963	36	
o-Xylene	35.0	1.0	"	32.8	ND	107	33-159	1.76	26	
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.2		98.0	37-154			
Surrogate: Toluene-d8	12.7		"	13.3		95.5	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	45-146			

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Project: Wiedeman 21B, 24-21, 21-1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/25/14 16:29

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

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

Joseph J Egry IV For Paul Shrewsbury, President