

PDC Energy, Inc.
Second Quarter 2013 Groundwater Monitoring Summary

August 14, 2013

Wiedeman 21B, 24-21, 21-2 Tank Battery
NESW S21 T15N 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 May 23, 2013, groundwater sampling was conducted at four monitoring well locations. A groundwater sample was not collected from MW01 due to insufficient water. 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 2. The laboratory analytical report is included as Attachment A. Evaluation of second quarter analytical results indicates that BTEX concentrations remained below COGCC standards at the four sample locations. Although MW01 had insufficient water to collect a sample, it historically has exhibited elevated benzene concentrations.

Between March 21 and 22, 2013, in accordance with a Class V - Underground Injection Control (UIC) permit that was submitted to the U.S. Environmental Protection Agency, Region 8 on October 9, 2012, chemical oxidant (chemox) injection activities were conducted at the Site. Chemox injections were conducted at monitoring well MW01 and a summary of the chemox injection volumes and the measured back pressure during the injection activities are summarized in the table below:

Chemox Injection Volumes and Pressure

Well ID	25% NaOH Volume	Persulfate (lbs)	Injection Back Pressure (psi)
MW01	240	1,200	15 - 20

Notes:

25% NaOH Volume - Percent sodium hydroxide measured in gallons
lbs - Pounds

The chemox material consisted of Klozur persulfate which persists in groundwater and therefore, the constituents of concern (COC) concentrations are anticipated to remain below COGCC standards. Quarterly groundwater monitoring will continue to assess the effectiveness of chemox injections at the Site until four consecutive quarters of groundwater monitoring data, including monitoring well MW01, are below the COGCC standards.

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

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	5.0	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	10.3
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
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
MW02	5/18/2010	8.7	<1.0	14	<1.0	NM
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

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	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
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
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

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)
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
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
MW05	11/10/2010	<1.0	<1.0	<1.0	<1.0	10.67
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
COGCC standards for groundwater (ug/L) ⁽¹⁾		5	560	700	1,400	

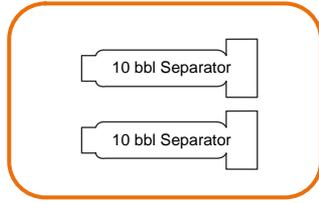
Notes:

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

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

ug/L= Micrograms per liter.

NM = Not Measured



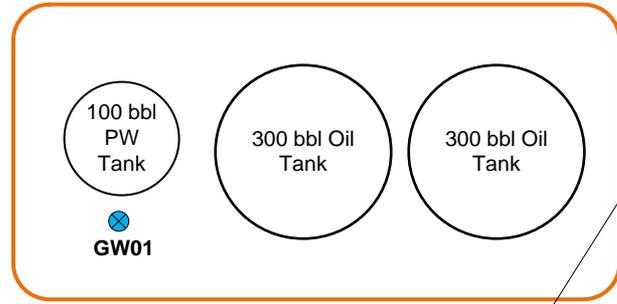
M

Surface
Drainage

MW01		
Compound (ug/L)	5/29/2012	5/3/2013
Benzene	180	DRY
Toluene	<1.0	DRY
Ethylbenzene	120	DRY
Total Xylenes	350	DRY

MW03		
Compound (ug/L)	5/29/2012	5/23/2013
Benzene	1.5	<1.0
Toluene	2.4	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

MW04		
Compound (ug/L)	5/29/2012	5/23/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0



MW01

MW02

MW03

MW04

MW05

MW05		
Compound (ug/L)	5/29/2012	5/23/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

MW02		
Compound (ug/L)	5/29/2012	5/23/2013
Benzene	<1.0	4.5
Toluene	<1.0	<1.0
Ethylbenzene	18	20
Total Xylenes	<1.0	74

Agriculture

Lease Road

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

DRAWN BY: ESS

DATE: 7/1/2013

Facility Diagram
PDC Energy – DJ Basin
Wiedeman 21B, 24-21, 21-2
NESW S21 T15N R67W
Weld County, CO



6899 Pecos St., Unit C
Denver CO 80221

LEGEND

— Earthen Berm

⊗ Temporary Monitoring Well Location

⊗ Groundwater Sample Location

M Meter Shed

FIGURE 2

GROUNDWATER
ANALYTICAL
RESULTS

Not to Scale

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 29, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Wiedeman 21B, 24-21, 21-2

Enclosed are the results of analyses for samples received by Summit Scientific on 05/23/13 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV

Laboratory Director

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

Summit Scientific is the sole authority for authorizing edits or modifications to this document. Unauthorized modification of this report is strictly prohibited.



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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/29/13 16:25

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW02	R305243-01	Water	05/23/13 10:20	05/23/13 17:45
MW03	R305243-02	Water	05/23/13 10:25	05/23/13 17:45
MW04	R305243-03	Water	05/23/13 10:30	05/23/13 17:45
MW05	R305243-04	Water	05/23/13 10:35	05/23/13 17:45

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: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW02
R305243-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	4.5	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	20	1.0	"	"	"	"	"	"	
Xylenes (total)	74	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:20**

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>		99.7 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		103 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW03

R305243-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		91.5 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.0 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.9 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW04
R305243-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		78.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.7 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW05
R305243-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %	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: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/29/13 16:25

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 3052818 - EPA 5030 Water MS

Blank (3052818-BLK1)

Prepared & Analyzed: 05/29/13

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>14.1</i>		<i>"</i>	<i>13.2</i>		<i>107</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.7</i>		<i>"</i>	<i>13.3</i>		<i>103</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.5</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>45-146</i>			

LCS (3052818-BS1)

Prepared & Analyzed: 05/29/13

Benzene	25.0	1.0	ug/l	33.3		75.1	51-132			
Toluene	24.8	1.0	"	33.3		74.5	51-138			
Ethylbenzene	25.9	1.0	"	33.3		77.8	58-146			
m,p-Xylene	52.9	2.0	"	66.7		79.3	57-144			
o-Xylene	25.7	1.0	"	33.3		77.2	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>14.3</i>		<i>"</i>	<i>13.2</i>		<i>108</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>98.0</i>	<i>45-146</i>			

LCS Dup (3052818-BSD1)

Prepared & Analyzed: 05/29/13

Benzene	24.1	1.0	ug/l	33.3		72.3	51-132	3.79	17	
Toluene	23.8	1.0	"	33.3		71.6	51-138	4.07	17	
Ethylbenzene	25.0	1.0	"	33.3		74.9	58-146	3.73	16	
m,p-Xylene	50.4	2.0	"	66.7		75.5	57-144	4.84	16	
o-Xylene	24.6	1.0	"	33.3		73.8	53-146	4.41	15	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>14.1</i>		<i>"</i>	<i>13.2</i>		<i>107</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.7</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>99.7</i>	<i>45-146</i>			

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/29/13 16:25

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 3052818 - EPA 5030 Water MS

Matrix Spike (3052818-MS1)	Source: R305243-04			Prepared & Analyzed: 05/29/13						
Benzene	25.0	1.0	ug/l	33.3	ND	75.0	34-141			
Toluene	25.1	1.0	"	33.3	ND	75.2	27-151			
Ethylbenzene	26.9	1.0	"	33.3	ND	80.6	29-160			
m,p-Xylene	55.0	2.0	"	66.7	ND	82.5	20-166			
o-Xylene	26.2	1.0	"	33.3	ND	78.6	33-159			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.1</i>		<i>"</i>	<i>13.2</i>		<i>91.4</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.4</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>			

Matrix Spike Dup (3052818-MSD1)	Source: R305243-04			Prepared & Analyzed: 05/29/13						
Benzene	22.3	1.0	ug/l	33.3	ND	66.8	34-141	11.6	32	
Toluene	22.4	1.0	"	33.3	ND	67.1	27-151	11.5	25	
Ethylbenzene	23.4	1.0	"	33.3	ND	70.3	29-160	13.6	50	
m,p-Xylene	48.2	2.0	"	66.7	ND	72.3	20-166	13.2	36	
o-Xylene	23.0	1.0	"	33.3	ND	69.1	33-159	12.8	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>11.5</i>		<i>"</i>	<i>13.2</i>		<i>87.1</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>			

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/29/13 16:25

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

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 29, 2013

Brandon Bruns

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Wiedeman 21B, 24-21, 21-2

Enclosed are the results of analyses for samples received by Summit Scientific on 05/23/13 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV

Laboratory Director

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

Summit Scientific is the sole authority for authorizing edits or modifications to this document. Unauthorized modification of this report is strictly prohibited.



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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/29/13 16:25

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW02	R305243-01	Water	05/23/13 10:20	05/23/13 17:45
MW03	R305243-02	Water	05/23/13 10:25	05/23/13 17:45
MW04	R305243-03	Water	05/23/13 10:30	05/23/13 17:45
MW05	R305243-04	Water	05/23/13 10:35	05/23/13 17:45

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW02
R305243-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	4.5	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	20	1.0	"	"	"	"	"	"	
Xylenes (total)	74	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:20**

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>		99.7 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		103 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW03
R305243-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		91.5 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.0 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.9 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW04
R305243-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		78.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.7 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 05/29/13 16:25

MW05
R305243-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3052818	05/29/13	05/29/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **05/23/13 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %	45-146		"	"	"	"	

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/29/13 16:25

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 3052818 - EPA 5030 Water MS

Blank (3052818-BLK1)

Prepared & Analyzed: 05/29/13

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>14.1</i>		<i>"</i>	<i>13.2</i>		<i>107</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.7</i>		<i>"</i>	<i>13.3</i>		<i>103</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.5</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>45-146</i>			

LCS (3052818-BS1)

Prepared & Analyzed: 05/29/13

Benzene	25.0	1.0	ug/l	33.3		75.1	51-132			
Toluene	24.8	1.0	"	33.3		74.5	51-138			
Ethylbenzene	25.9	1.0	"	33.3		77.8	58-146			
m,p-Xylene	52.9	2.0	"	66.7		79.3	57-144			
o-Xylene	25.7	1.0	"	33.3		77.2	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>14.3</i>		<i>"</i>	<i>13.2</i>		<i>108</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>98.0</i>	<i>45-146</i>			

LCS Dup (3052818-BSD1)

Prepared & Analyzed: 05/29/13

Benzene	24.1	1.0	ug/l	33.3		72.3	51-132	3.79	17	
Toluene	23.8	1.0	"	33.3		71.6	51-138	4.07	17	
Ethylbenzene	25.0	1.0	"	33.3		74.9	58-146	3.73	16	
m,p-Xylene	50.4	2.0	"	66.7		75.5	57-144	4.84	16	
o-Xylene	24.6	1.0	"	33.3		73.8	53-146	4.41	15	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>14.1</i>		<i>"</i>	<i>13.2</i>		<i>107</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.7</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>99.7</i>	<i>45-146</i>			

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

Project: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
05/29/13 16:25

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 3052818 - EPA 5030 Water MS

Matrix Spike (3052818-MS1)	Source: R305243-04			Prepared & Analyzed: 05/29/13							
Benzene	25.0	1.0	ug/l	33.3	ND	75.0	34-141				
Toluene	25.1	1.0	"	33.3	ND	75.2	27-151				
Ethylbenzene	26.9	1.0	"	33.3	ND	80.6	29-160				
m,p-Xylene	55.0	2.0	"	66.7	ND	82.5	20-166				
o-Xylene	26.2	1.0	"	33.3	ND	78.6	33-159				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.1</i>		<i>"</i>	<i>13.2</i>		<i>91.4</i>	<i>37-154</i>				
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.4</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>				

Matrix Spike Dup (3052818-MSD1)	Source: R305243-04			Prepared & Analyzed: 05/29/13							
Benzene	22.3	1.0	ug/l	33.3	ND	66.8	34-141	11.6	32		
Toluene	22.4	1.0	"	33.3	ND	67.1	27-151	11.5	25		
Ethylbenzene	23.4	1.0	"	33.3	ND	70.3	29-160	13.6	50		
m,p-Xylene	48.2	2.0	"	66.7	ND	72.3	20-166	13.2	36		
o-Xylene	23.0	1.0	"	33.3	ND	69.1	33-159	12.8	26		
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>11.5</i>		<i>"</i>	<i>13.2</i>		<i>87.1</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: Wiedeman 21B, 24-21, 21-2

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
05/29/13 16:25

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