



PDC Energy, Inc.
Second Quarter 2013 Groundwater Monitoring Summary

August 14, 2013

Cottonwood #1 Tank Battery
NESE Section 13 T6N R66W
Weld County, API # 05-123-11801

This groundwater summary has been prepared by Tasman Geosciences, LLC for the Cottonwood #1 tank battery. On June 20, 2013 groundwater sampling was conducted at seven 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 first and second quarter 2013 analytical results are illustrated on Figure 2. Second quarter analytical results indicate that benzene concentrations were in exceedance of COGCC regulatory standards in wells BH02 and BH03, although concentrations in these wells continue to decline. BTEX concentrations remained below standards in all other monitoring wells during the reporting period.

Tasman continued enhanced fluid recovery (EFR) and air sparge (AS) events at the site during the second quarter 2013. A summary of the EFR/AS operational data is provided in Table 2. EFR/AS activities will continue through the third quarter 2013.

The third quarter 2013 groundwater sampling event will be conducted during September 2013.

TABLE 1
COTTONWOOD #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)
GW01	8/21/2012	3,000	1.7	320	1,900	NM
BH01	9/24/2012	160	<1.0	40	<1.0	16.31
BH01	12/20/2012	5	<1.0	<1.0	6.8	16.13
BH01	3/18/2013	<1.0	<1.0	<1.0	<1.0	16.58
BH01	6/20/2013	<1.0	<1.0	<1.0	<1.0	11.16
BH02	9/24/2012	1,300	<1.0	190	1,100	18.42
BH02	12/20/2012	24	<1.0	3.9	8.1	17.35
BH02	3/18/2013	18	<1.0	<1.0	<1.0	17.80
BH02	6/20/2013	15	<1.0	<1.0	<1.0	12.58
BH03	9/24/2012	350	<1.0	120	300	18.28
BH03	12/20/2012	15	<1.0	6.7	7.9	17.04
BH03	3/18/2013	14	<1.0	1.5	<1.0	17.46
BH03	6/20/2013	11	<1.0	2.1	<1.0	12.01
BH04	9/24/2012	150	<1.0	96	400	16.58
BH04	12/20/2012	38	<1.0	40	170	13.95
BH04	3/18/2013	2.6	<1.0	<1.0	<1.0	14.38
BH04	6/20/2013	1.3	<1.0	5.4	19	8.70
BH05	9/24/2012	<1.0	<1.0	<1.0	<1.0	15.42
BH05	12/20/2012	<1.0	<1.0	<1.0	<1.0	16.86
BH05	3/18/2013	<1.0	<1.0	<1.0	<1.0	17.31
BH05	6/20/2013	<1.0	<1.0	<1.0	<1.0	11.42
BH06	9/24/2012	6.7	18	7.5	50	15.35
BH06	12/20/2012	<1.0	<1.0	<1.0	<1.0	16.79
BH06	3/18/2013	3.6	1.2	<1.0	<1.0	14.74
BH06	6/20/2013	<1.0	<1.0	<1.0	<1.0	11.72
BH07	9/24/2012	<1.0	<1.0	<1.0	<1.0	16.86
BH07	12/20/2012	<1.0	<1.0	<1.0	<1.0	18.32
BH07	3/18/2013	<1.0	<1.0	<1.0	<1.0	18.77
BH07	6/20/2013	1.6	<1.0	<1.0	<1.0	13.70
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

TABLE 2
COTTONWOOD #1
AIR SPARGE / EFR OPERATIONAL SUMMARY TABLE

Fourth Quarter 2012				
Date	Well ID	Extraction Duration (hours)	Volume Extracted (gallons)	AS Pressure (psi)
11/2/2012	BH01, BH02, BH03, BH04	6.75	13.8	10
11/14/2012		6	110	10
12/12/2012		6	400	10
Totals		18.75	523.8	-
First Quarter 2013				
Date	Well ID	Extraction Duration (hours)	Volume Extracted (gallons)	AS Pressure (psi)
1/4/2013	BH01, BH02, BH03, BH04	6.5	185	10
1/18/2013		6.25	272	10
2/2/2013		6	278	10
2/15/2013		7	180	10
3/5/2013		6.75	364	10
3/22/2013		4	90	10
Totals		36.5	1369	-
Second Quarter 2013				
4/3/2013	BH01, BH02, BH03, BH04	5	275	10
4/19/2013		6.5	373	10
5/13/2013		6	385	10
5/23/2013		6	151	10
6/6/2013		6	387	10
6/17/2013		5	300	10
Totals		34.5	1871	-

Notes:

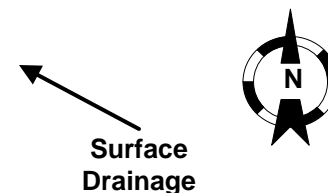
psi = pounds per square inch

Separator
Secondary
Containment

BH06		
Compound (ug/L)	3/18/2013	6/20/2013
Benzene	3.6	<1.0
Toluene	1.2	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH-07 ⊕

BH07		
Compound (ug/L)	3/18/2013	6/20/2013
Benzene	<1.0	1.6
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0



Private Land

Native
Vegetation

⊕
BH-06

BH01		
Compound (ug/L)	3/18/2013	6/20/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

⊕
BH-01

BH02		
Compound (ug/L)	3/18/2013	6/20/2013
Benzene	18	15
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

⊕
BH-02

BH04		
Compound (ug/L)	3/18/2013	6/20/2013
Benzene	2.6	1.3
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

Irrigation Canal

Flow

BH05		
Compound (ug/L)	3/18/2013	6/20/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

⊗
SW01

⊕
BH-05

⊕
BH-04

100 bbl
PW Tank

300 bbl
Condensate Tank

300 bbl
Condensate Tank

⊗
GW01

BH03		
Compound (ug/L)	3/18/2013	6/20/2013
Benzene	14	11
Toluene	<1.0	<1.0
Ethylbenzene	1.5	2.1
Total Xylenes	<1.0	<1.0

⊕
BH-03

Access Road

Note: Surface drainage is approximated based on visual observation of the tank battery. It is not based on regional topography.

PROJECT
NO:

DRAWN BY: ESS

DATE: 7/11/2013

Facility Diagram
PDC Energy – DJ Basin
Cottonwood #1
NESE S13 T6N R66W
Weld County, CO



6899 Pecos Street
Unit C
Denver, CO 80221

LEGEND

- ⊕ Earthen Berm
- ⊗ Temporary Monitoring Well
- ⊗ Surface Water Sample Location Collected During Excavation Activities
- ⊗ Groundwater Sample Location Collected During Excavation Activities

FIGURE 2
GROUNDWATER
ANALYTICAL RESULTS

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

June 26, 2013

Brandon Bruns
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Cottonwood #1

Enclosed are the results of analyses for samples received by Summit Scientific on 06/20/13 18:00. 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: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	R306165-01	Water	06/20/13 10:15	06/20/13 18:00
BH02	R306165-02	Water	06/20/13 10:20	06/20/13 18:00
BH03	R306165-03	Water	06/20/13 10:25	06/20/13 18:00
BH04	R306165-04	Water	06/20/13 10:30	06/20/13 18:00
BH05	R306165-05	Water	06/20/13 10:35	06/20/13 18:00
BH06	R306165-06	Water	06/20/13 10:40	06/20/13 18:00
BH07	R306165-07	Water	06/20/13 10:45	06/20/13 18:00

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

Project: Cottonwood #1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

R306165

Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9100 • 303-274-5933 Fax

Client: PDC Energy Page 1 of 1
Address: _____
City/State/Zip: _____
Phone: _____ Project Manager: Brandon Bruns
Fax: _____ E-Mail: _____
Sample Name: Cottonwood #1 Project Name: _____
Project Number: _____

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative	Matrix	Analyze For:	Special Instructions
B401	6/20/13	1015	3	None	Air - Canister Serial #		
B402		1020		None	Other (Specify)		
B403		1025		None	Other (Specify)		
B404		1030		None	Other (Specify)		
B405		1035		None	Other (Specify)		
B406		1040		None	Other (Specify)		
B407		1045		None	Other (Specify)		
Retiquished by: <u>Eric A. Jorgensen</u> Date/Time: <u>6/20/13 1015</u> Turn Around Time (Check) <input checked="" type="checkbox"/> 72 hours <input type="checkbox"/> Standard							
Retiquished by: <u>Eric A. Jorgensen</u> Date/Time: <u>6/20/13 1040</u> Turn Around Time (Check) <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard							
Retiquished by: _____ Date/Time: _____ Turn Around Time (Check) <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard							
Notes: <u>11/1</u>							



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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

BH01
R306165-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/13 10:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	1.0	ug/l	1	3062506	06/26/13	06/26/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/20/13 10:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		96.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %	45-146		"	"	"	"	

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/26/13 15:41

BH02
R306165-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	15	1.0	ug/l	1	3062506	06/26/13	06/26/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/20/13 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.0 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.7 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %	45-146		"	"	"	"	

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/26/13 15:41

BH03
R306165-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/13 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	11	1.0	ug/l	1	3062506	06/26/13	06/26/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	2.1	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/20/13 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.6 %	45-146		"	"	"	"	

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/26/13 15:41

BH04
R306165-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.3	1.0	ug/l	1	3062506	06/26/13	06/26/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	5.4	1.0	"	"	"	"	"	"	
Xylenes (total)	19	1.0	"	"	"	"	"	"	

Date Sampled: **06/20/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.8 %	45-146		"	"	"	"	

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

BH05
R306165-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/13 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3062506	06/26/13	06/26/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **06/20/13 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		98.3 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		98.4 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %		45-146		"	"	"	"	

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

BH06
R306165-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/13 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3062506	06/26/13	06/26/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/20/13 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.5 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.8 %	45-146		"	"	"	"	

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/26/13 15:41

BH07
R306165-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/20/13 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.6	1.0	ug/l	1	3062506	06/26/13	06/26/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/20/13 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.0 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.5 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/26/13 15:41

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 3062506 - EPA 5030 Water MS

Blank (3062506-BLK1)

Prepared & Analyzed: 06/25/13

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		101	37-154			
Surrogate: Toluene-d8	13.3		"	13.3		99.5	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.8	45-146			

Blank (3062506-BLK2)

Prepared & Analyzed: 06/25/13

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		106	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		99.3	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.5	45-146			

LCS (3062506-BS1)

Prepared & Analyzed: 06/25/13

Benzene	26.2	1.0	ug/l	33.3		78.5	51-132			
Toluene	26.5	1.0	"	33.3		79.5	51-138			
Ethylbenzene	27.0	1.0	"	33.3		80.9	58-146			
m,p-Xylene	55.3	2.0	"	66.7		82.9	57-144			
o-Xylene	26.6	1.0	"	33.3		79.9	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.4		"	13.2		109	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		98.8	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	45-146			

LCS (3062506-BS2)

Prepared & Analyzed: 06/25/13

Benzene	28.8	1.0	ug/l	33.3		86.6	51-132			
Toluene	29.2	1.0	"	33.3		87.7	51-138			
Ethylbenzene	30.3	1.0	"	33.3		90.9	58-146			
m,p-Xylene	61.3	2.0	"	66.7		92.0	57-144			
o-Xylene	30.3	1.0	"	33.3		90.9	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.4		"	13.2		109	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.7	45-146			

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

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 3062506 - EPA 5030 Water MS

LCS Dup (3062506-BSD1)

Prepared & Analyzed: 06/25/13

Benzene	29.3	1.0	ug/l	33.3		87.8	51-132	11.3	17	
Toluene	29.9	1.0	"	33.3		89.6	51-138	12.0	17	
Ethylbenzene	28.9	1.0	"	33.3		86.7	58-146	6.84	16	
m,p-Xylene	59.7	2.0	"	66.7		89.6	57-144	7.79	16	
o-Xylene	29.1	1.0	"	33.3		87.3	53-146	8.83	15	
Surrogate: 1,2-Dichloroethane-d4	15.0		"	13.2		113	37-154			
Surrogate: Toluene-d8	13.8		"	13.3		103	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.2	45-146			

LCS Dup (3062506-BSD2)

Prepared & Analyzed: 06/25/13

Benzene	26.2	1.0	ug/l	33.3		78.7	51-132	9.48	17	
Toluene	25.6	1.0	"	33.3		76.9	51-138	13.1	17	
Ethylbenzene	26.4	1.0	"	33.3		79.1	58-146	13.8	16	
m,p-Xylene	59.6	2.0	"	66.7		89.5	57-144	2.78	16	
o-Xylene	26.1	1.0	"	33.3		78.3	53-146	14.9	15	
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.2		106	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		98.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.8	45-146			

Matrix Spike (3062506-MS1)

Source: R306163-01

Prepared & Analyzed: 06/25/13

Benzene	24.0	1.0	ug/l	33.3	ND	72.2	34-141			
Toluene	24.7	1.0	"	33.3	ND	74.0	27-151			
Ethylbenzene	25.1	1.0	"	33.3	ND	75.4	29-160			
m,p-Xylene	51.0	2.0	"	66.7	ND	76.5	20-166			
o-Xylene	25.4	1.0	"	33.3	ND	76.4	33-159			
Surrogate: 1,2-Dichloroethane-d4	14.5		"	13.2		109	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.5	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	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.



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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

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 3062506 - EPA 5030 Water MS

Matrix Spike (3062506-MS2)				Source: R306163-04		Prepared: 06/25/13		Analyzed: 06/26/13	
Benzene	28.4	1.0	ug/l	33.3	ND	85.1	34-141		
Toluene	29.0	1.0	"	33.3	ND	87.2	27-151		
Ethylbenzene	29.5	1.0	"	33.3	ND	88.5	29-160		
m,p-Xylene	60.1	2.0	"	66.7	ND	90.1	20-166		
o-Xylene	29.5	1.0	"	33.3	ND	88.6	33-159		
Surrogate: 1,2-Dichloroethane-d4				13.2		111	37-154		
Surrogate: Toluene-d8				13.3		100	45-149		
Surrogate: 4-Bromofluorobenzene				13.3		100	45-146		
Matrix Spike Dup (3062506-MSD1)				Source: R306163-01		Prepared: 06/25/13		Analyzed: 06/26/13	
Benzene	26.4	1.0	ug/l	33.3	ND	79.1	34-141	9.16	32
Toluene	27.0	1.0	"	33.3	ND	81.0	27-151	9.10	25
Ethylbenzene	27.6	1.0	"	33.3	ND	82.7	29-160	9.30	50
m,p-Xylene	56.8	2.0	"	66.7	ND	85.1	20-166	10.6	36
o-Xylene	27.5	1.0	"	33.3	ND	82.6	33-159	7.82	26
Surrogate: 1,2-Dichloroethane-d4				13.2		112	37-154		
Surrogate: Toluene-d8				13.3		100	45-149		
Surrogate: 4-Bromofluorobenzene				13.3		101	45-146		

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/26/13 15:41

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

A handwritten signature in black ink, appearing to read 'Daniel A. Bruns IV'.