

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: Nolte 14-44 BWQ

Accutest Job Number: D56061

Sampling Date: 03/18/14

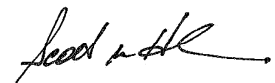
Report to:

Western Water and Land, Inc.
743 Horizon Court Suite 330
Grand Junction, CO 80506
bsmith@westernwaterandland.com; jpahler@westernwaterandland.com
ATTN: Bruce Smith

Total number of pages in report: 55



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



Scott Heideman
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

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

Table of Contents

-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Summary of Hits	7
Section 4: Sample Results	9
4.1: D56061-1: METCALF 274330	10
4.2: D56061-1F: METCALF 274330	14
4.3: D56061-2: METCALF 69030-F	15
4.4: D56061-2F: METCALF 69030-F	19
4.5: D56061-3: TRIP BLANK	20
Section 5: Misc. Forms	21
5.1: Chain of Custody	22
Section 6: GC/MS Volatiles - QC Data Summaries	23
6.1: Method Blank Summary	24
6.2: Blank Spike Summary	25
6.3: Matrix Spike Summary	27
6.4: Duplicate Summary	29
Section 7: GC Volatiles - QC Data Summaries	30
7.1: Method Blank Summary	31
7.2: Blank Spike Summary	32
7.3: Matrix Spike/Matrix Spike Duplicate Summary	33
Section 8: GC Semi-volatiles - QC Data Summaries	34
8.1: Method Blank Summary	35
8.2: Blank Spike Summary	36
8.3: Matrix Spike/Matrix Spike Duplicate Summary	37
Section 9: Metals Analysis - QC Data Summaries	38
9.1: Prep QC MP12541: Se	39
9.2: Prep QC MP12544: Ba,B,Ca,Fe,Mg,Mn,K,Na,Sr	43
Section 10: General Chemistry - QC Data Summaries	51
10.1: Method Blank and Spike Results Summary	52
10.2: Duplicate Results Summary	53
10.3: Matrix Spike Results Summary	54
10.4: Matrix Spike Duplicate Results Summary	55

1

2

3

4

5

6

7

8

9

10



Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D56061

WWLCOGJ: Nolte 14-44 BWQ

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D56061-1	03/18/14	11:50	SKNS 03/19/14	AQ	Ground Water	METCALF 274330
D56061-1F	03/18/14	11:50	SKNS 03/19/14	AQ	Groundwater Filtered	METCALF 274330
D56061-2	03/18/14	12:30	SKNS 03/19/14	AQ	Ground Water	METCALF 69030-F
D56061-2F	03/18/14	12:30	SKNS 03/19/14	AQ	Groundwater Filtered	METCALF 69030-F
D56061-3	03/18/14	00:00	SKNS 03/19/14	AQ	Trip Blank Water	TRIP BLANK



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WPX Energy Rocky Mountain, LLC

Job No D56061

Site: WWLCOGJ: Nolte 14-44 BWQ

Report Date 3/31/2014 2:30:37 PM

On 03/19/2014, 2 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D56061 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ	Batch ID: V7V1415
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56060-1DUP, D55795-36MS were used as the QC samples indicated.
- D55795-36MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.

Volatiles by GC By Method RSK175 MOD

Matrix AQ	Batch ID: GFB488
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56088-1MS, D56088-1MSD were used as the QC samples indicated.
- D56061-2: The pH of the sample was >2 at time of analysis.
- D56061-1: The pH of the sample was >2 at time of analysis.

Extractables by GC By Method SW846-8015B

Matrix AQ	Batch ID: OP9592
------------------	-------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D55795-7MS, D55795-7MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method EPA 200.7

Matrix AQ	Batch ID: MP12544
------------------	--------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56059-1MS, D56059-1MSD were used as the QC samples for the metals analysis.

Metals By Method EPA 200.8

Matrix AQ	Batch ID: MP12541
------------------	--------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56085-1FAMSD, D56085-1FAMS were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ	Batch ID: GP12181
------------------	--------------------------

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56068-2MS, D56068-2MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- D56061-2 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.
- D56061-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.
- D56061-2 for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.

Wet Chemistry By Method HACH IRB-BART

Matrix AQ	Batch ID: MB338
------------------	------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SLYM-BART

Matrix AQ	Batch ID: MB339
------------------	------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH SRB-BART

Matrix AQ	Batch ID: MB340
------------------	------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method HACH8190/SM4500P-B/E

Matrix AQ	Batch ID: GP12241
------------------	--------------------------

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56017-3DUP, D56017-3MS, D56017-3MSD were used as the QC samples for the Phosphorus, Total analysis.

Wet Chemistry By Method SM 2320B-2011

Matrix AQ **Batch ID:** GN24111

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56152-1DUP, D56165-1MS, D56165-1MSD were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix AQ **Batch ID:** GN24112

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix AQ **Batch ID:** GN24113

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SM 2510B-2011

Matrix AQ **Batch ID:** GP12229

- Sample(s) D56152-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix AQ **Batch ID:** GN24049

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D56036-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix AQ **Batch ID:** GN24031

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D56061-1, D56061-2

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Summary of Hits

Job Number: D56061
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ
Collected: 03/18/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

D56061-1 METCALF 274330

Alkalinity, Bicarbonate as CaCO3	443	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	443	5.0	2.0	mg/l	SM 2320B-2011
Bromide	0.51	0.25	0.13	mg/l	EPA 300.0/SW846 9056
Chloride	159	50	20	mg/l	EPA 300.0/SW846 9056
Fluoride	0.73	0.50	0.25	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	2300	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	2.7	0.050	0.030	mg/l	EPA 300.0/SW846 9056
Slime Forming Bacteria	500	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	2060	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	2430	1.0		umhos/cm	SM 2510B-2011
Sulfate	886	50	20	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	18000	200		CFU/ml	HACH SRB-BART
pH	7.41			su	SM4500HB+ -2011/9040C

D56061-1F METCALF 274330

Barium	17.6	10		ug/l	EPA 200.7
Boron	212	50		ug/l	EPA 200.7
Calcium	136000	400		ug/l	EPA 200.7
Magnesium	130000	200		ug/l	EPA 200.7
Potassium	2690	1000		ug/l	EPA 200.7
Selenium	29.0	0.80		ug/l	EPA 200.8
Sodium	292000	400		ug/l	EPA 200.7
Strontium	2960	5.0		ug/l	EPA 200.7

D56061-2 METCALF 69030-F

Methane ^a	0.00071 J	0.00080	0.00040	mg/l	RSK175 MOD
Alkalinity, Bicarbonate as CaCO3	541	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Carbonate	215	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	755	5.0	2.0	mg/l	SM 2320B-2011
Bromide	1.2	0.50	0.25	mg/l	EPA 300.0/SW846 9056
Chloride	280	5.0	2.0	mg/l	EPA 300.0/SW846 9056
Fluoride	1.4	1.0	0.50	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	2300	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria	12500	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	4750	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	5330	1.0		umhos/cm	SM 2510B-2011
Sulfate	2470	100	40	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	359000	200		CFU/ml	HACH SRB-BART
pH	9.02			su	SM4500HB+ -2011/9040C

Summary of Hits

Job Number: D56061
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ
Collected: 03/18/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

D56061-2F METCALF 69030-F

Boron	661	50			ug/l	EPA 200.7
Calcium	24100	400			ug/l	EPA 200.7
Magnesium	336000	200			ug/l	EPA 200.7
Potassium	9440	1000			ug/l	EPA 200.7
Selenium	1.0	0.80			ug/l	EPA 200.8
Sodium	851000	400			ug/l	EPA 200.7
Strontium	406	5.0			ug/l	EPA 200.7

D56061-3 TRIP BLANK

No hits reported in this sample.

(a) The pH of the sample was > 2 at time of analysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: METCALF 274330 Lab Sample ID: D56061-1 Matrix: AQ - Ground Water Method: SW846 8260B Project: WWLCOGJ: Nolte 14-44 BWQ	Date Sampled: 03/18/14 Date Received: 03/19/14 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25708.D	1	03/20/14	JL	n/a	n/a	V7V1415
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics + GRO

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	96%		62-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	87%		69-130%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: METCALF 274330	Date Sampled: 03/18/14
Lab Sample ID: D56061-1	Date Received: 03/19/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: RSK175 MOD	
Project: WWLCOGJ: Nolte 14-44 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB10805.D	1	03/24/14	JJ	n/a	n/a	GFB488
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	21.0 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00040	mg/l	
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.0022	0.0011	mg/l	

(a) The pH of the sample was > 2 at time of analysis.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: METCALF 274330 Lab Sample ID: D56061-1 Matrix: AQ - Ground Water Method: SW846-8015B SW846 3510C Project: WWLCOGJ: Nolte 14-44 BWQ	Date Sampled: 03/18/14 Date Received: 03/19/14 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI11314.D	1	03/29/14	JS	03/20/14	OP9592	GFI723
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1060 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.19	0.17	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		10-130%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

Client Sample ID: METCALF 274330	Date Sampled: 03/18/14
Lab Sample ID: D56061-1	Date Received: 03/19/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: WWLCOGJ: Nolte 14-44 BWQ	

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	443	5.0	2.0	mg/l	1	03/27/14	JD	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	03/27/14	JD	SM 2320B-2011
Alkalinity, Total as CaCO3	443	5.0	2.0	mg/l	1	03/27/14	JD	SM 2320B-2011
Bromide	0.51	0.25	0.13	mg/l	5	03/19/14 14:20	SK	EPA 300.0/SW846 9056
Chloride	159	50	20	mg/l	100	03/19/14 19:29	SK	EPA 300.0/SW846 9056
Fluoride	0.73	0.50	0.25	mg/l	5	03/19/14 14:20	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	2300	25		CFU/ml	1	03/20/14	MM	HACH IRB-BART
Nitrogen, Nitrate	2.7	0.050	0.030	mg/l	5	03/19/14 14:20	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite ^a	0.015 U	0.020	0.015	mg/l	5	03/19/14 14:20	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.0080 U	0.010	0.0080	mg/l	1	03/27/14	BF	HACH8190/SM4500P-B/E
Slime Forming Bacteria	500	500		CFU/ml	1	03/20/14	MM	HACH SLYM-BART
Solids, Total Dissolved	2060	10	5.0	mg/l	1	03/24/14	AK	SM 2540C-2011
Specific Conductivity	2430	1.0		umhos/cm	1	03/26/14	RW	SM 2510B-2011
Sulfate	886	50	20	mg/l	100	03/19/14 19:29	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	18000	200		CFU/ml	1	03/20/14	MM	HACH SRB-BART
pH	7.41			su	1	03/20/14 14:50	AK	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: METCALF 274330 Lab Sample ID: D56061-1F Matrix: AQ - Groundwater Filtered Project: WWLCOGJ: Nolte 14-44 BWQ	Date Sampled: 03/18/14 Date Received: 03/19/14 Percent Solids: n/a
--	---

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	17.6	10	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Boron	212	50	ug/l	1	03/21/14	03/24/14 JB	EPA 200.7 ²	EPA 200.7 ⁵
Calcium	136000	400	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Iron	< 10	10	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Magnesium	130000	200	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Manganese	< 5.0	5.0	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Potassium	2690	1000	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Selenium	29.0	0.80	ug/l	2	03/21/14	03/24/14 NT	EPA 200.8 ³	EPA 200.8 ⁴
Sodium	292000	400	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Strontium	2960	5.0	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵

- (1) Instrument QC Batch: MA4574
- (2) Instrument QC Batch: MA4579
- (3) Instrument QC Batch: MA4582
- (4) Prep QC Batch: MP12541
- (5) Prep QC Batch: MP12544

RL = Reporting Limit

4.2
4

Report of Analysis

Client Sample ID: METCALF 69030-F Lab Sample ID: D56061-2 Matrix: AQ - Ground Water Method: SW846 8260B Project: WWLCOGJ: Nolte 14-44 BWQ	Date Sampled: 03/18/14 Date Received: 03/19/14 Percent Solids: n/a
--	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25709.D	1	03/20/14	JL	n/a	n/a	V7V1415
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics + GRO

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	87%		62-130%
2037-26-5	Toluene-D8	104%		70-130%
460-00-4	4-Bromofluorobenzene	86%		69-130%

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: METCALF 69030-F	Date Sampled: 03/18/14
Lab Sample ID: D56061-2	Date Received: 03/19/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: RSK175 MOD	
Project: WWLCOGJ: Nolte 14-44 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB10806.D	1	03/24/14	JJ	n/a	n/a	GFB488
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	21.0 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.00071	0.00080	0.00040	mg/l	J
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.0022	0.0011	mg/l	

(a) The pH of the sample was > 2 at time of analysis.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: METCALF 69030-F Lab Sample ID: D56061-2 Matrix: AQ - Ground Water Method: SW846-8015B SW846 3510C Project: WWLCOGJ: Nolte 14-44 BWQ	Date Sampled: 03/18/14 Date Received: 03/19/14 Percent Solids: n/a
--	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI11316.D	1	03/29/14	JS	03/20/14	OP9592	GFI723
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1060 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.19	0.17	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	86%		10-130%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

Client Sample ID: METCALF 69030-F	Date Sampled: 03/18/14
Lab Sample ID: D56061-2	Date Received: 03/19/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: WWLCOGJ: Nolte 14-44 BWQ	

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	541	5.0	2.0	mg/l	1	03/27/14	JD	SM 2320B-2011
Alkalinity, Carbonate	215	5.0	2.0	mg/l	1	03/27/14	JD	SM 2320B-2011
Alkalinity, Total as CaCO3	755	5.0	2.0	mg/l	1	03/27/14	JD	SM 2320B-2011
Bromide	1.2	0.50	0.25	mg/l	10	03/19/14 14:32	SK	EPA 300.0/SW846 9056
Chloride	280	5.0	2.0	mg/l	10	03/19/14 14:32	SK	EPA 300.0/SW846 9056
Fluoride	1.4	1.0	0.50	mg/l	10	03/19/14 14:32	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	2300	25		CFU/ml	1	03/20/14	MM	HACH IRB-BART
Nitrogen, Nitrate ^a	0.060 U	0.10	0.060	mg/l	10	03/19/14 14:32	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite ^a	0.030 U	0.040	0.030	mg/l	10	03/19/14 14:32	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.0080 U	0.010	0.0080	mg/l	1	03/27/14	BF	HACH8190/SM4500P-B/E
Slime Forming Bacteria	12500	500		CFU/ml	1	03/20/14	MM	HACH SLYM-BART
Solids, Total Dissolved	4750	10	5.0	mg/l	1	03/24/14	AK	SM 2540C-2011
Specific Conductivity	5330	1.0		umhos/cm	1	03/26/14	RW	SM 2510B-2011
Sulfate	2470	100	40	mg/l	200	03/19/14 19:41	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	359000	200		CFU/ml	1	03/20/14	MM	HACH SRB-BART
pH	9.02			su	1	03/20/14 14:50	AK	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID: METCALF 69030-F Lab Sample ID: D56061-2F Matrix: AQ - Groundwater Filtered Project: WWLCOGJ: Nolte 14-44 BWQ	Date Sampled: 03/18/14 Date Received: 03/19/14 Percent Solids: n/a
---	---

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	< 10	10	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Boron	661	50	ug/l	1	03/21/14	03/24/14 JB	EPA 200.7 ²	EPA 200.7 ⁵
Calcium	24100	400	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Iron	< 10	10	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Magnesium	336000	200	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Manganese	< 5.0	5.0	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Potassium	9440	1000	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Selenium	1.0	0.80	ug/l	2	03/21/14	03/25/14 NT	EPA 200.8 ³	EPA 200.8 ⁴
Sodium	851000	400	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵
Strontium	406	5.0	ug/l	1	03/21/14	03/21/14 JB	EPA 200.7 ¹	EPA 200.7 ⁵

- (1) Instrument QC Batch: MA4574
- (2) Instrument QC Batch: MA4579
- (3) Instrument QC Batch: MA4582
- (4) Prep QC Batch: MP12541
- (5) Prep QC Batch: MP12544

RL = Reporting Limit

4.4
4

Report of Analysis

Client Sample ID: TRIP BLANK		
Lab Sample ID: D56061-3		Date Sampled: 03/18/14
Matrix: AQ - Trip Blank Water		Date Received: 03/19/14
Method: SW846 8260B		Percent Solids: n/a
Project: WWLCOGJ: Nolte 14-44 BWQ		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25710.D	1	03/20/14	JL	n/a	n/a	V7V1415
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics + GRO

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	94%		62-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	85%		69-130%

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
 4

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL 303-425-6021 FAX: 303-425-6854
www.accutest.com

Form containing tracking information, requested analyses (PH, SCOM, TDS, etc.), matrix codes, and collection details.

Form containing client/reporting information, project information, billing information, and sample collection data.

5.1 5

D56061: Chain of Custody

Page 1 of 1

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D56061
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1415-MB	7V25698.D	1	03/20/14	JL	n/a	n/a	V7V1415

The QC reported here applies to the following samples:

Method: SW846 8260B

D56061-1, D56061-2, D56061-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.25	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.25	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	2.0	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Limits	
17060-07-0	1,2-Dichloroethane-D4	97%	62-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	88%	69-130%

Blank Spike Summary

Job Number: D56061
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1415-BS	7V25699.D	1	03/20/14	JL	n/a	n/a	V7V1415

The QC reported here applies to the following samples:

Method: SW846 8260B

D56061-1, D56061-2, D56061-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	49.6	99	70-130
100-41-4	Ethylbenzene	50	56.5	113	70-130
108-88-3	Toluene	50	55.6	111	70-130
1330-20-7	Xylene (total)	150	171	114	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	93%	62-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	93%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D56061
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1415-BS	7V25700.D	1	03/20/14	JL	n/a	n/a	V7V1415

The QC reported here applies to the following samples:

Method: SW846 8260B

D56061-1, D56061-2, D56061-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1820	83	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	94%	62-130%
2037-26-5	Toluene-D8	104%	70-130%
460-00-4	4-Bromofluorobenzene	90%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D56061
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55795-36MS ^a	7V25702.D	1	03/20/14	JL	n/a	n/a	V7V1415
D55795-36 ^a	7V25704.D	1	03/20/14	JL	n/a	n/a	V7V1415

The QC reported here applies to the following samples:

Method: SW846 8260B

D56061-1, D56061-2, D56061-3

CAS No.	Compound	D55795-36 ug/l	Spike Q	MS ug/l	MS %	Limits
71-43-2	Benzene	ND	50	49.6	99	62-130
100-41-4	Ethylbenzene	ND	50	56.1	112	63-130
108-88-3	Toluene	ND	50	56.3	113	60-130
1330-20-7	Xylene (total)	ND	150	172	115	67-130

CAS No.	Surrogate Recoveries	MS	D55795-36	Limits
17060-07-0	1,2-Dichloroethane-D4	95%	93%	62-130%
2037-26-5	Toluene-D8	104%	106%	70-130%
460-00-4	4-Bromofluorobenzene	94%	84%	69-130%

(a) The pH of the sample aliquot for VOA analysis was > 2 at time of analysis.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D56061
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55795-36MS ^a	7V25703.D	1	03/20/14	JL	n/a	n/a	V7V1415
D55795-36 ^a	7V25704.D	1	03/20/14	JL	n/a	n/a	V7V1415

The QC reported here applies to the following samples:

Method: SW846 8260B

D56061-1, D56061-2, D56061-3

CAS No.	Compound	D55795-36 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	ND	2200	1990	90	19-168	

CAS No.	Surrogate Recoveries	MS	D55795-36	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	93%	62-130%
2037-26-5	Toluene-D8	104%	106%	70-130%
460-00-4	4-Bromofluorobenzene	89%	84%	69-130%

(a) The pH of the sample aliquot for VOA analysis was > 2 at time of analysis.

* = Outside of Control Limits.

Duplicate Summary

Job Number: D56061
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D56060-1DUP	7V25706.D	1	03/20/14	JL	n/a	n/a	V7V1415
D56060-1	7V25705.D	1	03/20/14	JL	n/a	n/a	V7V1415

The QC reported here applies to the following samples:

Method: SW846 8260B

D56061-1, D56061-2, D56061-3

CAS No.	Compound	D56060-1 ug/l	DUP Q	D56060-1 ug/l	Q	RPD	Limits
71-43-2	Benzene	ND		ND		nc	30
100-41-4	Ethylbenzene	ND		ND		nc	30
108-88-3	Toluene	ND		ND		nc	30
1330-20-7	Xylene (total)	ND		ND		nc	30
	TPH-GRO (C6-C10)	ND		ND		nc	30

CAS No.	Surrogate Recoveries	DUP	D56060-1	Limits
17060-07-0	1,2-Dichloroethane-D4	91%	92%	62-130%
2037-26-5	Toluene-D8	106%	105%	70-130%
460-00-4	4-Bromofluorobenzene	82%	87%	69-130%

* = Outside of Control Limits.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D56061
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB488-MB	FB10797.D	1	03/24/14	JJ	n/a	n/a	GFB488

The QC reported here applies to the following samples:

Method: RSK175 MOD

D56061-1, D56061-2

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00040	mg/l	
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.0022	0.0011	mg/l	

7.1.1

7

Blank Spike Summary

Job Number: D56061
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB488-BS	FB10798.D	10	03/24/14	JJ	n/a	n/a	GFB488

The QC reported here applies to the following samples:

Method: RSK175 MOD

D56061-1, D56061-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.606	119	70-130
74-84-0	Ethane	0.956	1.06	111	70-130
74-98-6	Propane	1.4	1.58	113	67-130

7.2.1

7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D56061
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D56088-1MS	FB10800.D	10	03/24/14	JJ	n/a	n/a	GFB488
D56088-1MSD	FB10801.D	10	03/24/14	JJ	n/a	n/a	GFB488
D56088-1	FB10799.D	1	03/24/14	JJ	n/a	n/a	GFB488

The QC reported here applies to the following samples:

Method: RSK175 MOD

D56061-1, D56061-2

CAS No.	Compound	D56088-1 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	ND	0.51	0.524	103	0.513	101	2	51-155/30
74-84-0	Ethane	ND	0.956	0.924	97	0.897	94	3	58-130/30
74-98-6	Propane	ND	1.4	1.37	98	1.34	96	2	46-130/30

7.3.1
7

* = Outside of Control Limits.

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D56061
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9592-MB	FI11050.D	1	03/21/14	JJ	03/20/14	OP9592	GFI711

The QC reported here applies to the following samples:

Method: SW846-8015B

D56061-1, D56061-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.20	0.18	mg/l	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	84% 10-130%

Blank Spike Summary

Job Number: D56061
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9592-BS	FI11052.D	1	03/21/14	JJ	03/20/14	OP9592	GFI711

The QC reported here applies to the following samples:

Method: SW846-8015B

D56061-1, D56061-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	3.07	61	33-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	84%	10-130%

8.2.1

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D56061
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9592-MS	FI11074.D	1	03/23/14	JJ	03/20/14	OP9592	GFI713
OP9592-MSD	FI11056.D	1	03/21/14	JJ	03/20/14	OP9592	GFI711
D55795-7	FI11058.D	1	03/21/14	JJ	03/20/14	OP9592	GFI711

The QC reported here applies to the following samples:

Method: SW846-8015B

D56061-1, D56061-2

CAS No.	Compound	D55795-7 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	5	2.81	56	2.42	48	15	33-130/30
CAS No.	Surrogate Recoveries	MS	MSD	D55795-7	Limits				
84-15-1	o-Terphenyl	75%	61%	80%	10-130%				

8.3.1
8

* = Outside of Control Limits.

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- **Method Blank Summaries**
- **Matrix Spike and Duplicate Summaries**
- **Blank Spike and Lab Control Sample Summaries**
- **Serial Dilution Summaries**

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12541
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 03/21/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	1.1	2		
Antimony	0.40	.0022	.011		
Arsenic	0.20	.017	.044		
Barium	2.0	.016	.079		
Beryllium	0.20	.016	.069		
Boron	40	.49	2.1		
Cadmium	0.10	.036	.042		
Calcium	400	5.6	12		
Chromium	2.0	.053	.053		
Cobalt	0.20	.0049	.015		
Copper	2.0	.06	.13		
Iron	10	3.5	4.6		
Lead	0.50	.0079	.008		
Magnesium	100	1.3	1.3		
Manganese	1.0	.12	.13		
Molybdenum	1.0	.049	.029		
Nickel	2.0	.0088	.027		
Phosphorus	60	2.6	4.3		
Potassium	200	2.9	2.9		
Selenium	0.40	.06	.21	0.0040	<0.40
Silver	0.10	.0019	.008		
Sodium	500	4.9	4.9		
Strontium	20	.01	.015		
Thallium	0.20	.0024	.005		
Tin	10	.063	1.3		
Titanium	2.0	.059	.092		
Uranium	0.20	.0017	.002		
Vanadium	1.0	.037	.2		
Zinc	10	.21	.96		

Associated samples MP12541: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

9.1.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D56061
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12541
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 03/21/14

Metal	D56085-1FA Original MS	SpikeLot ICPAL2	% Rec	QC Limits	
Aluminum	anr				
Antimony	anr				
Arsenic	anr				
Barium	anr				
Beryllium	anr				
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Magnesium					
Manganese	anr				
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium					
Selenium	16.6	206	200	94.7	70-130
Silver	anr				
Sodium					
Strontium					
Thallium	anr				
Tin					
Titanium					
Uranium	anr				
Vanadium					
Zinc	anr				

Associated samples MP12541: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D56061
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12541
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 03/21/14

Metal	D56085-1FA Original MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit	
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	anr					
Beryllium	anr					
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Magnesium						
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium						
Selenium	16.6	198	200	90.7	4.0	20
Silver	anr					
Sodium						
Strontium						
Thallium	anr					
Tin						
Titanium						
Uranium	anr					
Vanadium						
Zinc	anr					

Associated samples MP12541: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

9.1.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D56061
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12541
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 03/21/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium				
Selenium	201	200	100.5	85-115
Silver	anr			
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium	anr			
Vanadium				
Zinc	anr			

Associated samples MP12541: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

9.1.3
 9

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12544
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 03/21/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	8.6	11		
Antimony	30	2.1	21		
Arsenic	25	3.8	9		
Barium	10	.2	1.4	0.0	<10
Beryllium	10	.8	1.7		
Boron	50	6.7	6.6	2.0	<50
Cadmium	10	.2	.36		
Calcium	400	2.2	66	6.8	<400
Chromium	10	.3	1.4		
Cobalt	5.0	.4	.51		
Copper	10	.8	1.5		
Iron	10	1.5	3.2	3.1	<10
Lead	50	2.1	4.1		
Lithium	5.0	.4	1.9		
Magnesium	200	6.8	29	-18	<200
Manganese	5.0	.01	.29	0.10	<5.0
Molybdenum	10	.4	1.1		
Nickel	30	.5	.87		
Phosphorus	100	15	24		
Potassium	1000	99	230	1.0	<1000
Selenium	50	7.1	9.3		
Silicon	50	4.7	5.6		
Silver	30	.3	.4		
Sodium	400	4.9	36	141	<400
Strontium	5.0	.01	.12	0.0	<5.0
Thallium	10	1.8	4.9		
Tin	50	12	13		
Titanium	10	.1	.43		
Uranium	50	2.9	3.9		
Vanadium	10	.4	.39		
Zinc	30	.4	1.9		

Associated samples MP12544: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

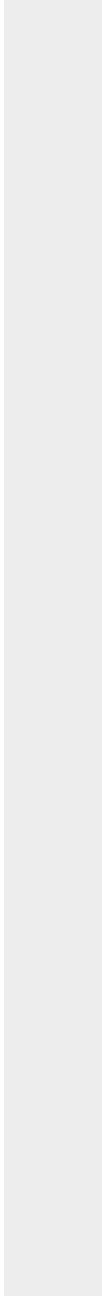
QC Batch ID: MP12544
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 03/21/14

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D56061
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12544
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 03/21/14

Metal	D56059-1 Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	48.7	1840	2000	89.8	70-130
Beryllium					
Boron	202	1290	1000	111.5	70-130
Cadmium					
Calcium	116000	142000	25000	104.0	70-130
Chromium	anr				
Cobalt	anr				
Copper	anr				
Iron	885	5720	5000	96.7	70-130
Lead	anr				
Lithium					
Magnesium	181000	204000	25000	92.0	70-130
Manganese	285	801	500	103.2	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	4130	30400	25000	105.1	70-130
Selenium	anr				
Silicon					
Silver					
Sodium	741000	701000	25000	80.0	70-130
Strontium	2000	2330	500	94.0	70-130
Thallium					
Tin	anr				
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP12544: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

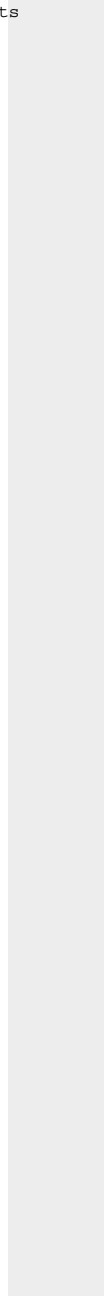
QC Batch ID: MP12544
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 03/21/14

Metal	D56059-1 Original MS	SpikeLot ICPALL2	% Rec	QC Limits
-------	-------------------------	---------------------	-------	--------------

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested



9.2.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D56061
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12544
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 03/21/14

Metal	D56059-1 Original MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	anr					
Barium	48.7	1840	2000	89.8	0.0	20
Beryllium						
Boron	202	1270	1000	109.5	1.6	20
Cadmium						
Calcium	116000	140000	25000	96.0	1.4	20
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	885	5810	5000	98.5	1.6	20
Lead	anr					
Lithium						
Magnesium	181000	206000	25000	100.0	1.0	20
Manganese	285	779	500	98.8	2.8	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	4130	31000	25000	107.5	2.0	20
Selenium	anr					
Silicon						
Silver						
Sodium	741000	700000	25000	76.0	0.1	20
Strontium	2000	2350	500	98.0	0.9	20
Thallium						
Tin	anr					
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP12544: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

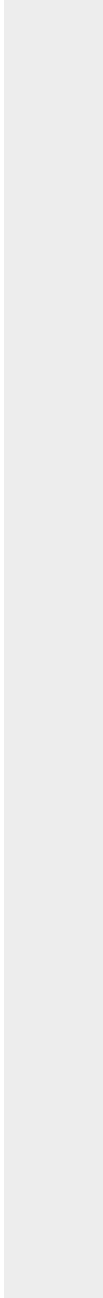
QC Batch ID: MP12544
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 03/21/14

Metal	D56059-1 Original MSD	SpikeLot ICPALL2	% Rec	MSD RPD	QC Limit
-------	--------------------------	---------------------	-------	------------	-------------

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D56061
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: Nolte 14-44 BWQ

QC Batch ID: MP12544
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 03/21/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	1890	2000	94.5	85-115
Beryllium				
Boron	1030	1000	103.0	85-115
Cadmium				
Calcium	25900	25000	103.6	85-115
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	4880	5000	97.6	85-115
Lead	anr			
Lithium				
Magnesium	25700	25000	102.8	85-115
Manganese	508	500	101.6	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	25400	25000	101.6	85-115
Selenium	anr			
Silicon				
Silver				
Sodium	24900	25000	99.6	85-115
Strontium	473	500	94.6	85-115
Thallium				
Tin	anr			
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP12544: D56061-1F, D56061-2F

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

9.2.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

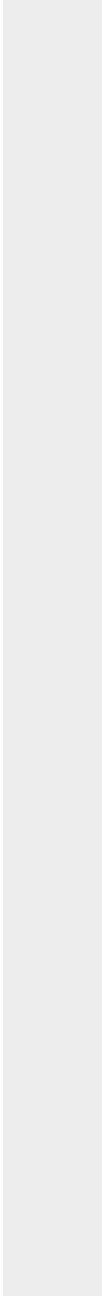
QC Batch ID: MP12544
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 03/21/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
-------	---------------	---------------------	-------	--------------

(anr) Analyte not requested



General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN24112	5.0	2.3	mg/l	100	101	101.2	90-110%
Alkalinity, Carbonate	GN24113	5.0	0.0	mg/l	100	100	101.2	80-120%
Alkalinity, Total as CaCO3	GN24111	5.0	2.3	mg/l	100	101	101.1	90-110%
Bromide	GP12181/GN24023	0.050	0.0	mg/l	0.5	0.519	103.8	90-110%
Chloride	GP12181/GN24023	0.50	0.0	mg/l	5	5.02	100.4	90-110%
Fluoride	GP12181/GN24023	0.10	0.0	mg/l	1	1.06	106.0	90-110%
Iron Reducing Bacteria	MB338	25	<25	CFU/ml				
Nitrogen, Nitrate	GP12181/GN24023	0.010	0.0	mg/l	0.1	0.105	105.0	90-110%
Nitrogen, Nitrite	GP12181/GN24023	0.0040	0.0	mg/l	0.05	0.0537	107.4	90-110%
Phosphorus, Total	GP12241/GN24130	0.010	0.0	mg/l	0.38	0.35	92.2	80-120%
Slime Forming Bacteria	MB339	500	<500	CFU/ml				
Solids, Total Dissolved	GN24049	10	0.0	mg/l	400	405	101.3	90-110%
Specific Conductivity	GP12229/GN24109			umhos/cm	99.5	104	104.8	90-110%
Sulfate	GP12181/GN24023	0.50	0.0	mg/l	5	4.96	99.2	90-110%
Sulfate Reducing Bacteria	MB340	200	<200	CFU/ml				
pH	GN24031			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:

Batch MB338: D56061-1, D56061-2
Batch MB339: D56061-1, D56061-2
Batch MB340: D56061-1, D56061-2
Batch GN24031: D56061-1, D56061-2
Batch GN24049: D56061-1, D56061-2
Batch GN24111: D56061-1, D56061-2
Batch GN24112: D56061-1, D56061-2
Batch GN24113: D56061-1, D56061-2
Batch GP12181: D56061-1, D56061-2
Batch GP12229: D56061-1, D56061-2
Batch GP12241: D56061-1, D56061-2

(*) Outside of QC limits

10.1
10

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN24111	D56152-1	mg/l	180	177	1.9	0-20%
Phosphorus, Total	GP12241/GN24130	D56017-3	mg/l	0.017	0.019	11.1	0-20%
Solids, Total Dissolved	GN24049	D56036-1	mg/l	2320	2320	0.0	0-20%
Specific Conductivity	GP12229/GN24109	D56152-1	umhos/cm	776	763	1.7	0-20%

Associated Samples:

Batch GN24049: D56061-1, D56061-2

Batch GN24111: D56061-1, D56061-2

Batch GP12229: D56061-1, D56061-2

Batch GP12241: D56061-1, D56061-2

(*) Outside of QC limits

10.2
10

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN24111	D56165-1	mg/l	254	100	348	93.7	80-120%
Bromide	GP12181/GN24023	D56068-2	mg/l	0.0	10	10.7	107.0	80-120%
Chloride	GP12181/GN24023	D56068-2	mg/l	47.9	100	147	99.1	80-120%
Fluoride	GP12181/GN24023	D56068-2	mg/l	1.7	20	20.7	95.0	80-120%
Nitrogen, Nitrate	GP12181/GN24023	D56068-2	mg/l	5.8	2	8.0	110.0	80-120%
Nitrogen, Nitrite	GP12181/GN24023	D56068-2	mg/l	0.14	1	1.3	116.0	80-120%
Phosphorus, Total	GP12241/GN24130	D56017-3	mg/l	0.017	0.40	0.35	83.3	80-120%
Sulfate	GP12181/GN24023	D56068-2	mg/l	20.4	100	121	100.6	80-120%

Associated Samples:

Batch GN24111: D56061-1, D56061-2

Batch GP12181: D56061-1, D56061-2

Batch GP12241: D56061-1, D56061-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D56061
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: Nolte 14-44 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN24111	D56165-1	mg/l	254	100	349	0.2	20%
Bromide	GP12181/GN24023	D56068-2	mg/l	0.0	10	10.7	0.0	20%
Chloride	GP12181/GN24023	D56068-2	mg/l	47.9	100	147	0.0	20%
Fluoride	GP12181/GN24023	D56068-2	mg/l	1.7	20	20.4	1.5	20%
Nitrogen, Nitrate	GP12181/GN24023	D56068-2	mg/l	5.8	2	7.9	1.3	20%
Nitrogen, Nitrite	GP12181/GN24023	D56068-2	mg/l	0.14	1	1.3	0.0	20%
Phosphorus, Total	GP12241/GN24130	D56017-3	mg/l	0.017	0.40	0.350	0.0	20%
Sulfate	GP12181/GN24023	D56068-2	mg/l	20.4	100	120	0.8	20%

Associated Samples:

Batch GN24111: D56061-1, D56061-2

Batch GP12181: D56061-1, D56061-2

Batch GP12241: D56061-1, D56061-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4
10