

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: GM 323-28 BWQ

Accutest Job Number: D60208

Sampling Date: 07/28/14

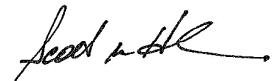
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Total number of pages in report: 55



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.



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

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Test results relate only to samples analyzed.

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Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D60208

WWLCOGJ: GM 323-28 BWQ

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D60208-1	07/28/14	14:50 NWS	07/29/14	AQ	Ground Water	GM 323-28-151879
D60208-1F	07/28/14	14:50 NWS	07/29/14	AQ	Groundwater Filtered	GM 323-28-151879
D60208-2	07/28/14	17:25 NWS	07/29/14	AQ	Ground Water	GM 11-28-185334
D60208-2F	07/28/14	17:25 NWS	07/29/14	AQ	Groundwater Filtered	GM 11-28-185334
D60208-3	07/28/14	00:00 NWS	07/29/14	AQ	Trip Blank Water	TRIP BLANK
D60208-4	07/28/14	00:00 NWS	07/29/14	AQ	Trip Blank Water	TRIP BLANK

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WPX Energy Rocky Mountain, LLC

Job No D60208

Site: WWLCOGJ: GM 323-28 BWQ

Report Date 8/12/2014 1:03:13 PM

On 07/29/2014, 2 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.2 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D60208 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: V6V1484
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- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60175-4MS, D60175-4MSD were used as the QC samples indicated.
- D60208-1,-2: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D60175-4MS and D60175-4MSD: 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: GFB547
-------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D59888-23MS, D59888-23MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D60208-2: The pH of the sample was >2 at time of analysis. Results may be bias low due to headspace. Analyzed per client instruction.
- D60208-1: The pH of the sample was >2 at time of analysis.
- D59888-23MSD: The pH of the sample was >2 at time of analysis.
- D59888-23MS: The pH of the sample was >2 at time of analysis.

Extractables by GC By Method SW846-8015B

Matrix: AQ	Batch ID: OP10341
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- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D60175-5MS, D60175-5MSD 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: MP13559
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- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60211-1FMS, D60211-1FMSD were used as the QC samples for the metals analysis.
- MP13559-MB1 for Iron: All sample results < RL or > 10x MB concentration.

Metals By Method EPA 200.8

Matrix: AQ **Batch ID:** MP13588

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60208-1FMS, D60208-1FMSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ **Batch ID:** GP13155

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60188-1MS, D60188-1MSD were used as the QC samples for the Bromide, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide, Chloride analysis.
- The matrix spike (MS) recovery(s) of Chloride are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

Wet Chemistry By Method HACH IRB-BART

Matrix: AQ **Batch ID:** MB403

- 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:** MB404

- 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:** MB405

- 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:** GP13193

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60208-2MS, D60208-2MSD, D60208-1DUP were used as the QC samples for the Phosphorus, Total analysis.
- The duplicate RPD(s) for Phosphorus, Total are outside control limits for sample GP13193-D1. RPD acceptable due to low duplicate and sample concentrations.

Wet Chemistry By Method SM 2320B-2011

Matrix: AQ **Batch ID:** GN25790

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60208-2DUP, D60208-2MS, D60208-2MSD were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix: AQ **Batch ID:** GN25791

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

Matrix: AQ **Batch ID:** GN25792

- 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:** GP13162

- Sample(s) D60208-2DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix: AQ **Batch ID:** GN25825

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D60289-2DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ **Batch ID:** GN25779

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D60208-1, D60208-2

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: D60208
 Account: WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ
 Collected: 07/28/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D60208-1 GM 323-28-151879

Methane ^a	0.0013	0.00080	0.00040	mg/l	RSK175 MOD
Alkalinity, Bicarbonate as CaCO3	485	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	485	5.0	2.0	mg/l	SM 2320B-2011
Chloride	32.6	1.0	0.80	mg/l	EPA 300.0/SW846 9056
Fluoride	1.4	0.20	0.10	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	74500	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	0.26	0.10	0.060	mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.039	0.0080	0.0060	mg/l	EPA 300.0/SW846 9056
Slime Forming Bacteria	350000	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	825	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	1120	1.0		umhos/cm	SM 2510B-2011
Sulfate	187	5.0	2.0	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	5000	200		CFU/ml	HACH SRB-BART
pH	7.40			su	SM4500HB+ -2011/9040C

D60208-1F GM 323-28-151879

Barium	47.5	4.0	0.16	ug/l	EPA 200.8
Boron	176	50	6.6	ug/l	EPA 200.7
Calcium	118000	400	66	ug/l	EPA 200.7
Iron	5.2 J	10	3.2	ug/l	EPA 200.7
Magnesium	56900	200	29	ug/l	EPA 200.7
Manganese	58.1	5.0	0.29	ug/l	EPA 200.7
Potassium	7300	1000	230	ug/l	EPA 200.7
Selenium	3.0	0.80	0.42	ug/l	EPA 200.8
Sodium	103000	400	36	ug/l	EPA 200.7
Strontium	1800	5.0	0.12	ug/l	EPA 200.7

D60208-2 GM 11-28-185334

Alkalinity, Bicarbonate as CaCO3	440	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	440	5.0	2.0	mg/l	SM 2320B-2011
Bromide	0.13	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Chloride	26.9	5.0	4.0	mg/l	EPA 300.0/SW846 9056
Fluoride	1.5	0.20	0.10	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	74500	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	0.021	0.020	0.012	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.012	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria	350000	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	830	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	1130	1.0		umhos/cm	SM 2510B-2011
Sulfate	229	5.0	2.0	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	18000	200		CFU/ml	HACH SRB-BART

Summary of Hits

Job Number: D60208
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ
Collected: 07/28/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
pH		7.44			su	SM4500HB+ -2011/9040C
D60208-2F	GM 11-28-185334					
Barium		28.8	4.0	0.16	ug/l	EPA 200.8
Boron		171	50	6.6	ug/l	EPA 200.7
Calcium		123000	400	66	ug/l	EPA 200.7
Iron		7.8 J	10	3.2	ug/l	EPA 200.7
Magnesium		48400	200	29	ug/l	EPA 200.7
Manganese		88.1	5.0	0.29	ug/l	EPA 200.7
Potassium		5870	1000	230	ug/l	EPA 200.7
Selenium		1.9	0.80	0.42	ug/l	EPA 200.8
Sodium		101000	400	36	ug/l	EPA 200.7
Strontium		1710	5.0	0.12	ug/l	EPA 200.7

D60208-3 TRIP BLANK

No hits reported in this sample.

D60208-4 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: GM 323-28-151879 Lab Sample ID: D60208-1 Matrix: AQ - Ground Water Method: SW846 8260B Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	6V26278.D	1	07/29/14	BR	n/a	n/a	V6V1484
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	0.31	ug/l	
1330-20-7	Xylene (total)	ND	3.0	1.5	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	110%		62-130%
2037-26-5	Toluene-D8	100%		70-130%
460-00-4	4-Bromofluorobenzene	96%		69-130%

(a) The pH of the sample aliquot for VOA analysis 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: GM 323-28-151879 Lab Sample ID: D60208-1 Matrix: AQ - Ground Water Method: RSK175 MOD Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
--	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB11771.D	1	08/04/14	JJ	n/a	n/a	GFB547
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	20.0 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0013	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: GM 323-28-151879 Lab Sample ID: D60208-1 Matrix: AQ - Ground Water Method: SW846-8015B SW846 3510C Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI14912.D	1	08/01/14	JJ	07/31/14	OP10341	GFI887
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1040 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	87%		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:	GM 323-28-151879	Date Sampled:	07/28/14
Lab Sample ID:	D60208-1	Date Received:	07/29/14
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Project:	WWLCOGJ: GM 323-28 BWQ		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	485	5.0	2.0	mg/l	1	07/30/14	BF	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	07/30/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	485	5.0	2.0	mg/l	1	07/30/14	BF	SM 2320B-2011
Bromide	0.050 U	0.10	0.050	mg/l	2	07/29/14 14:51	SK	EPA 300.0/SW846 9056
Chloride	32.6	1.0	0.80	mg/l	2	07/29/14 14:51	SK	EPA 300.0/SW846 9056
Fluoride	1.4	0.20	0.10	mg/l	2	07/29/14 14:51	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	74500	25		CFU/ml	1	08/04/14	MM	HACH IRB-BART
Nitrogen, Nitrate	0.26	0.10	0.060	mg/l	10	07/29/14 19:07	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.039	0.0080	0.0060	mg/l	2	07/29/14 14:51	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.0080 U	0.010	0.0080	mg/l	1	08/05/14	JD	HACH8190/SM4500P-B/E
Slime Forming Bacteria	350000	500		CFU/ml	1	08/04/14	MM	HACH SLYM-BART
Solids, Total Dissolved	825	10	5.0	mg/l	1	08/04/14	BF	SM 2540C-2011
Specific Conductivity	1120	1.0		umhos/cm	1	07/30/14	JD	SM 2510B-2011
Sulfate	187	5.0	2.0	mg/l	10	07/29/14 19:07	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	5000	200		CFU/ml	1	08/04/14	MM	HACH SRB-BART
pH	7.40			su	1	07/30/14 12:55	SK	SM4500HB+ -2011/9040C

RL = Reporting Limit
MDL = Method Detection Limit

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

Report of Analysis

Client Sample ID: GM 323-28-151879	Date Sampled: 07/28/14
Lab Sample ID: D60208-1F	Date Received: 07/29/14
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: WWLCOGJ: GM 323-28 BWQ	

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	47.5	4.0	0.16	ug/l	2	08/04/14	08/06/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Boron	176	50	6.6	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Calcium	118000	400	66	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Iron	5.2 J	10	3.2	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	56900	200	29	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Manganese	58.1	5.0	0.29	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Potassium	7300	1000	230	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Selenium	3.0	0.80	0.42	ug/l	2	08/04/14	08/06/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	103000	400	36	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Strontium	1800	5.0	0.12	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³

- (1) Instrument QC Batch: MA5049
- (2) Instrument QC Batch: MA5071
- (3) Prep QC Batch: MP13559
- (4) Prep QC Batch: MP13588

RL = Reporting Limit
 MDL = Method Detection Limit

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

4.2
 4

Report of Analysis

Client Sample ID: GM 11-28-185334 Lab Sample ID: D60208-2 Matrix: AQ - Ground Water Method: SW846 8260B Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	6V26279.D	1	07/29/14	BR	n/a	n/a	V6V1484
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	0.31	ug/l	
1330-20-7	Xylene (total)	ND	3.0	1.5	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	108%		62-130%
2037-26-5	Toluene-D8	99%		70-130%
460-00-4	4-Bromofluorobenzene	93%		69-130%

(a) The pH of the sample aliquot for VOA analysis 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: GM 11-28-185334 Lab Sample ID: D60208-2 Matrix: AQ - Ground Water Method: RSK175 MOD Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB11772.D	1	08/04/14	JJ	n/a	n/a	GFB547
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	20.0 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. Results may be bias low due to headspace. Analyzed per client instruction.

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: GM 11-28-185334 Lab Sample ID: D60208-2 Matrix: AQ - Ground Water Method: SW846-8015B SW846 3510C Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
--	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI14914.D	1	08/01/14	JJ	07/31/14	OP10341	GFI887
Run #2							

Run #	Initial Volume	Final Volume
Run #1	1040 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	51%		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: GM 11-28-185334	Date Sampled: 07/28/14
Lab Sample ID: D60208-2	Date Received: 07/29/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: WWLCOGJ: GM 323-28 BWQ	

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	440	5.0	2.0	mg/l	1	07/30/14	BF	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	07/30/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	440	5.0	2.0	mg/l	1	07/30/14	BF	SM 2320B-2011
Bromide	0.13	0.10	0.050	mg/l	2	07/29/14 15:05	SK	EPA 300.0/SW846 9056
Chloride	26.9	5.0	4.0	mg/l	10	07/29/14 19:22	SK	EPA 300.0/SW846 9056
Fluoride	1.5	0.20	0.10	mg/l	2	07/29/14 15:05	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	74500	25		CFU/ml	1	08/04/14	MM	HACH IRB-BART
Nitrogen, Nitrate	0.021	0.020	0.012	mg/l	2	07/29/14 15:05	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.0060 U	0.0080	0.0060	mg/l	2	07/29/14 15:05	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.012	0.010	0.0080	mg/l	1	08/05/14	JD	HACH8190/SM4500P-B/E
Slime Forming Bacteria	350000	500		CFU/ml	1	08/04/14	MM	HACH SLYM-BART
Solids, Total Dissolved	830	10	5.0	mg/l	1	08/04/14	BF	SM 2540C-2011
Specific Conductivity	1130	1.0		umhos/cm	1	07/30/14	JD	SM 2510B-2011
Sulfate	229	5.0	2.0	mg/l	10	07/29/14 19:22	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	18000	200		CFU/ml	1	08/04/14	MM	HACH SRB-BART
pH	7.44			su	1	07/30/14 12:55	SK	SM4500HB+ -2011/9040C

RL = Reporting Limit
MDL = Method Detection Limit

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

Report of Analysis

Client Sample ID: GM 11-28-185334 Lab Sample ID: D60208-2F Matrix: AQ - Groundwater Filtered Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
---	---

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	28.8	4.0	0.16	ug/l	2	08/04/14	08/06/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Boron	171	50	6.6	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Calcium	123000	400	66	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Iron	7.8 J	10	3.2	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	48400	200	29	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Manganese	88.1	5.0	0.29	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Potassium	5870	1000	230	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Selenium	1.9	0.80	0.42	ug/l	2	08/04/14	08/06/14 JB	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	101000	400	36	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³
Strontium	1710	5.0	0.12	ug/l	1	07/30/14	07/31/14 KV	EPA 200.7 ¹	EPA 200.7 ³

- (1) Instrument QC Batch: MA5049
- (2) Instrument QC Batch: MA5071
- (3) Prep QC Batch: MP13559
- (4) Prep QC Batch: MP13588

RL = Reporting Limit
 MDL = Method Detection Limit

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

4.4
4

Report of Analysis

Client Sample ID: TRIP BLANK Lab Sample ID: D60208-3 Matrix: AQ - Trip Blank Water Method: SW846 8260B Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V26280.D	1	07/29/14	BR	n/a	n/a	V6V1484
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	0.31	ug/l	
1330-20-7	Xylene (total)	ND	3.0	1.5	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	116%		62-130%
2037-26-5	Toluene-D8	98%		70-130%
460-00-4	4-Bromofluorobenzene	93%		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

4.5
4

Report of Analysis

Client Sample ID: TRIP BLANK Lab Sample ID: D60208-4 Matrix: AQ - Trip Blank Water Method: SW846 8260B Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 07/28/14 Date Received: 07/29/14 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6V26281.D	1	07/29/14	BR	n/a	n/a	V6V1484
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	0.31	ug/l	
1330-20-7	Xylene (total)	ND	3.0	1.5	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	113%		62-130%
2037-26-5	Toluene-D8	100%		70-130%
460-00-4	4-Bromofluorobenzene	96%		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

4.6
4

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

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: D60208
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1484-MB	6V26262.D	1	07/29/14	BR	n/a	n/a	V6V1484

The QC reported here applies to the following samples:

Method: SW846 8260B

D60208-1, D60208-2, D60208-3, D60208-4

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	0.31	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	1.5	ug/l	
	TPH-GRO (C6-C10)	ND	200	200	ug/l	

CAS No.	Surrogate Recoveries	Limits	
17060-07-0	1,2-Dichloroethane-D4	109%	62-130%
2037-26-5	Toluene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	97%	69-130%

Blank Spike Summary

Job Number: D60208
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1484-BS	6V26263.D	1	07/29/14	BR	n/a	n/a	V6V1484

The QC reported here applies to the following samples:

Method: SW846 8260B

D60208-1, D60208-2, D60208-3, D60208-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	51.8	104	70-130
100-41-4	Ethylbenzene	50	53.6	107	70-130
108-88-3	Toluene	50	52.2	104	70-130
1330-20-7	Xylene (total)	150	157	105	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	62-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	107%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D60208
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V6V1484-BS	6V26264.D	1	07/29/14	BR	n/a	n/a	V6V1484

The QC reported here applies to the following samples:

Method: SW846 8260B

D60208-1, D60208-2, D60208-3, D60208-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	2450	111	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	102%	62-130%
2037-26-5	Toluene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	100%	69-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D60208
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D60175-4MS ^a	6V26267A.D	25	07/29/14	BR	n/a	n/a	V6V1484
D60175-4MSD ^a	6V26268A.D	25	07/29/14	BR	n/a	n/a	V6V1484
D60175-4 ^a	6V26266A.D	25	07/29/14	BR	n/a	n/a	V6V1484

The QC reported here applies to the following samples:

Method: SW846 8260B

D60208-1, D60208-2, D60208-3, D60208-4

CAS No.	Compound	D60175-4 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	1250	1230	98	1250	1310	105	6	62-130/30
100-41-4	Ethylbenzene	ND	1250	1280	102	1250	1360	109	6	63-130/30
108-88-3	Toluene	ND	1250	1240	99	1250	1310	105	5	60-130/30
1330-20-7	Xylene (total)	ND	3750	3730	99	3750	3950	105	6	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D60175-4	Limits
17060-07-0	1,2-Dichloroethane-D4	106%	101%	111%	62-130%
2037-26-5	Toluene-D8	101%	98%	97%	70-130%
460-00-4	4-Bromofluorobenzene	106%	102%	98%	69-130%

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

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D60208
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D60175-4MS ^a	6V26269.D	25	07/29/14	BR	n/a	n/a	V6V1484
D60175-4MSD ^a	6V26270.D	25	07/29/14	BR	n/a	n/a	V6V1484
D60175-4 ^a	6V26266A.D	25	07/29/14	BR	n/a	n/a	V6V1484

The QC reported here applies to the following samples:

Method: SW846 8260B

D60208-1, D60208-2, D60208-3, D60208-4

CAS No.	Compound	D60175-4 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	55000	59600	108	55000	61500	112	3	19-168/30

CAS No.	Surrogate Recoveries	MS	MSD	D60175-4	Limits
17060-07-0	1,2-Dichloroethane-D4	102%	103%	111%	62-130%
2037-26-5	Toluene-D8	100%	99%	97%	70-130%
460-00-4	4-Bromofluorobenzene	101%	103%	98%	69-130%

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

* = 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: D60208
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB547-MB	FB11760.D	1	08/04/14	JJ	n/a	n/a	GFB547

The QC reported here applies to the following samples:

Method: RSK175 MOD

D60208-1, D60208-2

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: D60208
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB547-BS	FB11761.D	10	08/04/14	JJ	n/a	n/a	GFB547

The QC reported here applies to the following samples:

Method: RSK175 MOD

D60208-1, D60208-2

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	1.16	121	70-130
74-98-6	Propane	1.4	1.74	124	67-130

7.2.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D60208
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D59888-23MS ^a	FB11763.D	10	08/04/14	JJ	n/a	n/a	GFB547
D59888-23MSD ^a	FB11764.D	10	08/04/14	JJ	n/a	n/a	GFB547
D59888-23 ^a	FB11762.D	1	08/04/14	JJ	n/a	n/a	GFB547

The QC reported here applies to the following samples:

Method: RSK175 MOD

D60208-1, D60208-2

CAS No.	Compound	D59888-23		Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
		mg/l	Q								
74-82-8	Methane	ND		0.51	0.615	121	0.51	0.604	118	2	51-155/30
74-84-0	Ethane	ND		0.956	1.19	124	0.956	1.16	121	3	58-130/30
74-98-6	Propane	ND		1.4	1.79	128	1.4	1.76	126	2	46-130/30

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

* = Outside of Control Limits.

7.3.1
 7

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: D60208
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10341-MB	FH023793.D	1	07/31/14	JS	07/31/14	OP10341	GFH1079

The QC reported here applies to the following samples:

Method: SW846-8015B

D60208-1, D60208-2

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	53% 10-130%

Blank Spike Summary

Job Number: D60208
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10341-BS	FH023795.D	1	07/31/14	JS	07/31/14	OP10341	GFH1079

The QC reported here applies to the following samples:

Method: SW846-8015B

D60208-1, D60208-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.67	53	33-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	72%	10-130%

8.2.1
8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D60208
 Account: WILLCOP WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP10341-MS	FH023797.D	1	07/31/14	JS	07/31/14	OP10341	GFH1079
OP10341-MSD	FH023799.D	1	07/31/14	JS	07/31/14	OP10341	GFH1079
D60175-5	FH023801.D	1	07/31/14	JS	07/31/14	OP10341	GFH1079

The QC reported here applies to the following samples:

Method: SW846-8015B

D60208-1, D60208-2

CAS No.	Compound	D60175-5 mg/l	Spike Q mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	5	3.13	63	5	2.85	57	9	33-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D60175-5	Limits
84-15-1	o-Terphenyl	90%	79%	76%	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: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13559
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/30/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	8.6	11		
Antimony	30	3.2	21		
Arsenic	25	5.2	9		
Barium	10	1.4	1.4		
Beryllium	10	.8	1.7		
Boron	50	6.7	6.6	0.30	<50
Cadmium	10	.4	.36		
Calcium	400	2.2	66	6.2	<400
Chromium	10	.4	1.4		
Cobalt	5.0	.4	.51		
Copper	10	1.2	1.5		
Iron	10	2.2	3.2	7.1	* (a)
Lead	50	3.6	4.1		
Lithium	5.0	1.9	1.9		
Magnesium	200	14	29	2.3	<200
Manganese	5.0	.01	.29	0.10	<5.0
Molybdenum	10	.8	1.1		
Nickel	30	.9	.87		
Phosphorus	100	15	24		
Potassium	1000	130	230	-26	<1000
Selenium	50	8.8	9.3		
Silicon	50	5.2	5.6		
Silver	30	.4	.4		
Sodium	400	4.9	36	46.2	<400
Strontium	5.0	.01	.12	0.0	<5.0
Thallium	10	2.9	4.9		
Tin	50	13	13		
Titanium	10	.15	.43		
Uranium	50	3.7	3.9		
Vanadium	10	.4	.39		
Zinc	30	.6	1.9		

Associated samples MP13559: D60208-1F, D60208-2F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13559
Matrix Type: AQUEOUS

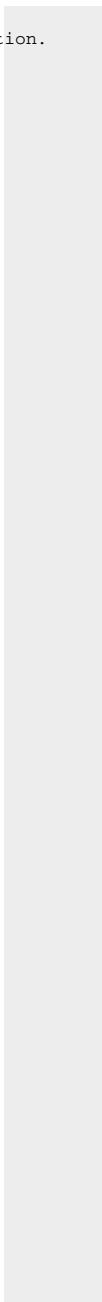
Methods: EPA 200.7
Units: ug/l

Prep Date: 07/30/14

Metal	RL	IDL	MDL	MB raw	final
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(anr) Analyte not requested

(a) All sample results < RL or > 10x MB concentration.



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D60208
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13559
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 07/30/14

Metal	D60211-1F		SpikeLot		QC
	Original	MS	ICPAL2	% Rec	Limits
Aluminum	anr				
Antimony					
Arsenic					
Barium	anr				
Beryllium					
Boron	314	1450	1000	113.6	70-130
Cadmium					
Calcium	44200	71800	25000	110.4	70-130
Chromium	anr				
Cobalt					
Copper					
Iron					
Lead	anr				
Lithium					
Magnesium	7300	34000	25000	106.8	70-130
Manganese	13.4	536	500	104.5	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	19500	48000	25000	114.0	70-130
Selenium					
Silicon					
Silver					
Sodium	119000	147000	25000	112.0	70-130
Strontium	342	875	500	106.6	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP13559: D60208-1F, D60208-2F

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

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

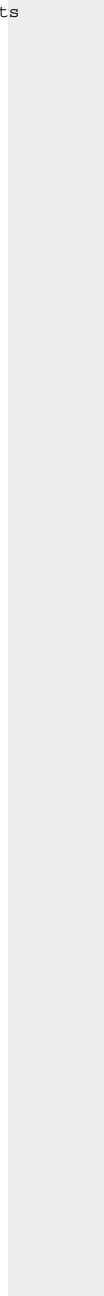
QC Batch ID: MP13559
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/30/14

Metal	D60211-1F Original MS	SpikeLot ICPAL2	% Rec	QC Limits
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(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested



9.1.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D60208
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13559
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 07/30/14

Metal	D60211-1F Original MSD		SpikeLot ICPAL2 % Rec		MSD RPD	QC Limit
Aluminum	anr					
Antimony						
Arsenic						
Barium	anr					
Beryllium						
Boron	314	1410	1000	109.6	2.8	20
Cadmium						
Calcium	44200	69700	25000	102.0	3.0	20
Chromium	anr					
Cobalt						
Copper						
Iron						
Lead	anr					
Lithium						
Magnesium	7300	33800	25000	106.0	0.6	20
Manganese	13.4	526	500	102.5	1.9	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	19500	47700	25000	112.8	0.6	20
Selenium						
Silicon						
Silver						
Sodium	119000	144000	25000	100.0	2.1	20
Strontium	342	862	500	104.0	1.5	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP13559: D60208-1F, D60208-2F

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

9.1.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D60208
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

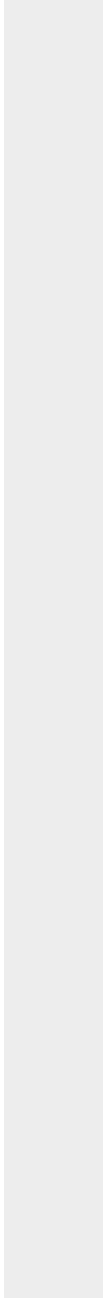
QC Batch ID: MP13559
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 07/30/14

Metal	D60211-1F Original MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit
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(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: D60208
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13559
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 07/30/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony				
Arsenic				
Barium	anr			
Beryllium				
Boron	1080	1000	108.0	85-115
Cadmium				
Calcium	26700	25000	106.8	85-115
Chromium	anr			
Cobalt				
Copper				
Iron	5130	5000	102.6	85-115
Lead	anr			
Lithium				
Magnesium	26300	25000	105.2	85-115
Manganese	523	500	104.6	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	27700	25000	110.8	85-115
Selenium				
Silicon				
Silver				
Sodium	27100	25000	108.4	85-115
Strontium	529	500	105.8	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP13559: D60208-1F, D60208-2F

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

9.1.3
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

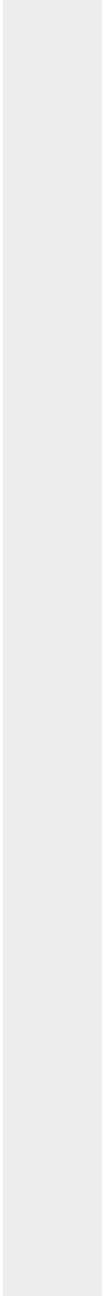
QC Batch ID: MP13559
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/30/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
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(anr) Analyte not requested



BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13588
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 08/04/14

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	0.035	<2.0
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	-0.030	<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 MP13588: D60208-1F, D60208-2F

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

9.2.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D60208
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13588
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 08/04/14

Metal	D60208-1F Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	47.5	429	400	95.1	70-130
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Magnesium					
Manganese	anr				
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium	anr				
Selenium	3.0	205	200	101.2	70-130
Silver	anr				
Sodium	anr				
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP13588: D60208-1F, D60208-2F

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

9.2.2
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D60208
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13588
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 08/04/14

Metal	D60208-1F Original MSD		SpikeLot ICPAL2 % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	47.5	451	400	100.6	5.0	20
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Magnesium						
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	anr					
Selenium	3.0	195	200	96.2	5.0	20
Silver	anr					
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP13588: D60208-1F, D60208-2F

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

9.2.2
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D60208
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP13588
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 08/04/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	395	400	98.8	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	anr			
Selenium	195	200	97.5	85-115
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP13588: D60208-1F, D60208-2F

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

9.2.3
 9

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: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN25791	5.0	0.0	mg/l	100	99.2	99.2	90-110%
Alkalinity, Carbonate	GN25792	5.0	0.0	mg/l	100	99.2	99.2	80-120%
Alkalinity, Total as CaCO3	GN25790	5.0	0.0	mg/l	100	99.2	99.2	90-110%
Bromide	GP13155/GN25768	0.050	0.0	mg/l	0.5	0.522	104.4	90-110%
Chloride	GP13155/GN25768	0.50	0.0	mg/l	5	4.84	96.8	90-110%
Fluoride	GP13155/GN25768	0.10	0.0	mg/l	1	0.984	98.4	90-110%
Iron Reducing Bacteria	MB403	25	<25	CFU/ml				
Nitrogen, Nitrate	GP13155/GN25768	0.010	0.0	mg/l	0.1	0.103	103.0	90-110%
Nitrogen, Nitrite	GP13155/GN25768	0.0040	0.0	mg/l	0.05	0.0530	106.0	90-110%
Phosphorus, Total	GP13193/GN25855	0.010	0.0	mg/l	0.38	0.38	100.7	80-120%
Slime Forming Bacteria	MB404	500	<500	CFU/ml				
Solids, Total Dissolved	GN25825	10	0.0	mg/l	400	392	98.0	90-110%
Specific Conductivity	GP13162/GN25773			umhos/cm	99.6	96.1	96.5	90-110%
Sulfate	GP13155/GN25768	0.50	0.0	mg/l	5	4.92	98.4	90-110%
Sulfate Reducing Bacteria	MB405	200	<200	CFU/ml				
pH	GN25779			su	8.00	7.96	99.5	99.1-100.9%

Associated Samples:

Batch MB403: D60208-1, D60208-2
Batch MB404: D60208-1, D60208-2
Batch MB405: D60208-1, D60208-2
Batch GN25779: D60208-1, D60208-2
Batch GN25790: D60208-1, D60208-2
Batch GN25791: D60208-1, D60208-2
Batch GN25792: D60208-1, D60208-2
Batch GN25825: D60208-1, D60208-2
Batch GP13155: D60208-1, D60208-2
Batch GP13162: D60208-1, D60208-2
Batch GP13193: D60208-1, D60208-2

(*) Outside of QC limits

10.1
10

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN25790	D60208-2	mg/l	440	436	1.1	0-20%
Phosphorus, Total	GP13193/GN25855	D60208-1	mg/l	0.0080 U	0.0	200.0(a)	0-20%
Solids, Total Dissolved	GN25825	D60289-2	mg/l	542	529	2.4	0-20%
Specific Conductivity	GP13162/GN25773	D60208-2	umhos/cm	1130	1130	0.5	0-20%

Associated Samples:

Batch GN25790: D60208-1, D60208-2

Batch GN25825: D60208-1, D60208-2

Batch GP13162: D60208-1, D60208-2

Batch GP13193: D60208-1, D60208-2

(*) Outside of QC limits

(a) RPD acceptable due to low duplicate and sample concentrations.

10.2
10

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D60208
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN25790	D60208-2	mg/l	440	100	535	95.0	80-120%
Bromide	GP13155/GN25768	D60188-1	mg/l	0.13 U	0.5	0.56	112.0	80-120%
Bromide	GP13155/GN25768	D60188-1	mg/l	0.025 U	0.5	0.56	112.0	80-120%
Chloride	GP13155/GN25768	D60188-1	mg/l	9.2	5	15.7	124.0N(a)	80-120%
Chloride	GP13155/GN25768	D60188-1	mg/l	9.5	5	15.7	124.0N(a)	80-120%
Fluoride	GP13155/GN25768	D60188-1	mg/l	0.42 B	1	1.4	98.0	80-120%
Fluoride	GP13155/GN25768	D60188-1	mg/l	0.35	1	1.4	98.0	80-120%
Nitrogen, Nitrate	GP13155/GN25768	D60188-1	mg/l	0.20	0.1	0.31	110.0	80-120%
Nitrogen, Nitrate	GP13155/GN25768	D60188-1	mg/l	0.20	0.1	0.31	110.0	80-120%
Nitrogen, Nitrite	GP13155/GN25768	D60188-1	mg/l	0.028	0.05	0.086	116.0	80-120%
Nitrogen, Nitrite	GP13155/GN25768	D60188-1	mg/l	0.035	0.05	0.086	116.0	80-120%
Phosphorus, Total	GP13193/GN25855	D60208-2	mg/l	0.012	0.40	0.39	95.8	80-120%
Sulfate	GP13155/GN25768	D60188-1	mg/l	29.7	25	54.1	97.6	80-120%
Sulfate	GP13155/GN25768	D60188-1	mg/l	29.9	25	54.1	97.6	80-120%

Associated Samples:

Batch GN25790: D60208-1, D60208-2

Batch GP13155: D60208-1, D60208-2

Batch GP13193: D60208-1, D60208-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

10.3
10

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D60208
Account: WILLCOOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN25790	D60208-2	mg/l	440	100	532	0.6	20%
Bromide	GP13155/GN25768	D60188-1	mg/l	0.13 U	0.5	0.57	1.8	20%
Bromide	GP13155/GN25768	D60188-1	mg/l	0.025 U	0.5	0.57	1.8	20%
Chloride	GP13155/GN25768	D60188-1	mg/l	9.2	5	14.6	7.3	20%
Chloride	GP13155/GN25768	D60188-1	mg/l	9.5	5	14.6	7.3	20%
Fluoride	GP13155/GN25768	D60188-1	mg/l	0.42 B	1	1.4	0.0	20%
Fluoride	GP13155/GN25768	D60188-1	mg/l	0.35	1	1.4	0.0	20%
Nitrogen, Nitrate	GP13155/GN25768	D60188-1	mg/l	0.20	0.1	0.31	0.0	20%
Nitrogen, Nitrate	GP13155/GN25768	D60188-1	mg/l	0.20	0.1	0.31	0.0	20%
Nitrogen, Nitrite	GP13155/GN25768	D60188-1	mg/l	0.028	0.05	0.086	0.0	20%
Nitrogen, Nitrite	GP13155/GN25768	D60188-1	mg/l	0.035	0.05	0.086	0.0	20%
Phosphorus, Total	GP13193/GN25855	D60208-2	mg/l	0.012	0.40	0.38	3.1	20%
Sulfate	GP13155/GN25768	D60188-1	mg/l	29.7	25	54.3	0.4	20%
Sulfate	GP13155/GN25768	D60188-1	mg/l	29.9	25	54.3	0.4	20%

Associated Samples:

Batch GN25790: D60208-1, D60208-2

Batch GP13155: D60208-1, D60208-2

Batch GP13193: D60208-1, D60208-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4
10