



05/21/14

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: GM 323-28 BWQ

Accutest Job Number: D57542

Sampling Date: 05/07/14

Report to:

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Total number of pages in report: 49



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: D57542

WWLCOGJ: GM 323-28 BWQ

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D57542-1	05/07/14	11:30	NWS 05/08/14	AQ	Ground Water	UNION NO. 6-26068-F
D57542-1F	05/07/14	11:30	NWS 05/08/14	AQ	Groundwater Filtered	UNION NO. 6-26068-F
D57542-2	05/07/14	00:00	NWS 05/08/14	AQ	Trip Blank Water	TRIP BLANK



CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WPX Energy Rocky Mountain, LLC

Job No D57542

Site: WWLCOGJ: GM 323-28 BWQ

Report Date 5/21/2014 11:15:35 AM

On 05/08/2014, 1 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D57542 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:** V7V1448

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57587-5MS, D57582-10DUP were used as the QC samples indicated.
- D57582-10DUP: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D57542-2: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D57542-1: 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:** GFB508

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57479-1MS, D57479-1MSD were used as the QC samples indicated.
- D57542-1: Sample was not preserved to a pH < 2.

Extractables by GC By Method SW846-8015B

Matrix AQ **Batch ID:** OP9893

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D57451-13MS, D57451-13MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike duplicate (MSD) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Probable cause due to matrix interference.
- The RPD(s) for the MS and MSD recoveries of TPH-DRO (C10-C28) are outside control limits for sample OP9893-MSD. High RPD due to possible sample nonhomogeneity.

Metals By Method EPA 200.7

Matrix AQ **Batch ID:** MP12880

- 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) D57351-1FMS, D57351-1FMSD were used as the QC samples for the metals analysis.

Metals By Method EPA 200.8

Matrix AQ	Batch ID: MP12878
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- 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) D57450-1FMS, D57450-1FMSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ	Batch ID: GP12530
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- 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) D57520-2MS, D57520-2MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- D57542-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.
- D57542-1 for Bromide: Elevated detection limit due to matrix interference.
- D57542-1 for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.

Wet Chemistry By Method HACH IRB-BART

Matrix AQ	Batch ID: MB365
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- 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: MB366
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- 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: MB367
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- 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: GP12573
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- 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) D57458-1DUP, D57458-1MS, D57458-1MSD were used as the QC samples for the Phosphorus, Total analysis.

Wet Chemistry By Method SM 2320B-2011

Matrix AQ **Batch ID:** GN24645

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57409-1MS, D57409-1MSD, D57430-4DUP were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix AQ **Batch ID:** GN24646

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

Matrix AQ **Batch ID:** GN24647

- 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:** GP12559

- Sample(s) D57452-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix AQ **Batch ID:** GN24686

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57539-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

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: D57542
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ
Collected: 05/07/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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D57542-1 UNION NO. 6-26068-F

Methane ^a	0.0022	0.00080	0.00040	mg/l	RSK175 MOD
Alkalinity, Bicarbonate as CaCO3	507	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	507	5.0	2.0	mg/l	SM 2320B-2011
Bromide ^b	0.057 J	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Chloride	12.1	1.0	0.80	mg/l	EPA 300.0/SW846 9056
Fluoride	0.41	0.20	0.10	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	HACH IRB-BART
Phosphorus, Total	0.017	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria	66500	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	1720	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	2090	1.0		umhos/cm	SM 2510B-2011
Sulfate	778	25	10	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	359000	200		CFU/ml	HACH SRB-BART
pH	7.48			su	SM4500HB+ -2011/9040C

D57542-1F UNION NO. 6-26068-F

Barium	24.2	10	1.4	ug/l	EPA 200.7
Boron	149	50	6.6	ug/l	EPA 200.7
Calcium	131000	400	66	ug/l	EPA 200.7
Iron	21.2	10	3.2	ug/l	EPA 200.7
Magnesium	111000	200	29	ug/l	EPA 200.7
Manganese	90.2	5.0	0.29	ug/l	EPA 200.7
Potassium	3470	1000	230	ug/l	EPA 200.7
Sodium	272000	400	36	ug/l	EPA 200.7
Strontium	2220	5.0	0.12	ug/l	EPA 200.7

D57542-2 TRIP BLANK

No hits reported in this sample.

- (a) Sample was not preserved to a pH < 2.
- (b) Elevated detection limit due to matrix interference.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: UNION NO. 6-26068-F	
Lab Sample ID: D57542-1	Date Sampled: 05/07/14
Matrix: AQ - Ground Water	Date Received: 05/08/14
Method: SW846 8260B	Percent Solids: n/a
Project: WWLCOGJ: GM 323-28 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	7V26338.D	1	05/08/14	JL	n/a	n/a	V7V1448
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	93%		62-130%
2037-26-5	Toluene-D8	96%		70-130%
460-00-4	4-Bromofluorobenzene	95%		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: UNION NO. 6-26068-F	Date Sampled: 05/07/14
Lab Sample ID: D57542-1	Date Received: 05/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: RSK175 MOD	
Project: WWLCOGJ: GM 323-28 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB11119.D	1	05/08/14	JS	n/a	n/a	GFB508
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	0.0022	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) Sample was not preserved to a pH < 2.

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: UNION NO. 6-26068-F	Date Sampled: 05/07/14
Lab Sample ID: D57542-1	Date Received: 05/08/14
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846-8015B SW846 3510C	
Project: WWLCOGJ: GM 323-28 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD31288.D	1	05/13/14	JS	05/13/14	OP9893	GFD1503
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	62%		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

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Report of Analysis

Client Sample ID: UNION NO. 6-26068-F	Date Sampled: 05/07/14
Lab Sample ID: D57542-1	Date Received: 05/08/14
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	507	5.0	2.0	mg/l	1	05/12/14	JD	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	05/12/14	JD	SM 2320B-2011
Alkalinity, Total as CaCO3	507	5.0	2.0	mg/l	1	05/12/14	JD	SM 2320B-2011
Bromide ^a	0.057 J	0.10	0.050	mg/l	2	05/08/14 12:51	SK	EPA 300.0/SW846 9056
Chloride	12.1	1.0	0.80	mg/l	2	05/08/14 12:51	SK	EPA 300.0/SW846 9056
Fluoride	0.41	0.20	0.10	mg/l	2	05/08/14 12:51	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	1	05/13/14	MM	HACH IRB-BART
Nitrogen, Nitrate ^a	0.012 U	0.020	0.012	mg/l	2	05/08/14 12:51	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite ^a	0.0060 U	0.0080	0.0060	mg/l	2	05/08/14 12:51	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.017	0.010	0.0080	mg/l	1	05/14/14	BF	HACH8190/SM4500P-B/E
Slime Forming Bacteria	66500	500		CFU/ml	1	05/13/14	MM	HACH SLYM-BART
Solids, Total Dissolved	1720	10	5.0	mg/l	1	05/14/14	JD	SM 2540C-2011
Specific Conductivity	2090	1.0		umhos/cm	1	05/13/14	AK	SM 2510B-2011
Sulfate	778	25	10	mg/l	50	05/08/14 18:45	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	359000	200		CFU/ml	1	05/13/14	MM	HACH SRB-BART
pH	7.48			su	1	05/08/14 14:55	SK	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

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: UNION NO. 6-26068-F Lab Sample ID: D57542-1F Matrix: AQ - Groundwater Filtered Project: WWLCOGJ: GM 323-28 BWQ	Date Sampled: 05/07/14 Date Received: 05/08/14 Percent Solids: n/a
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Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	24.2	10	1.4	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Boron	149	50	6.6	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Calcium	131000	400	66	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Iron	21.2	10	3.2	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Magnesium	111000	200	29	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Manganese	90.2	5.0	0.29	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Potassium	3470	1000	230	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Selenium	0.42 U	0.80	0.42	ug/l	2	05/09/14	05/20/14 NT	EPA 200.8 ²	EPA 200.8 ³
Sodium	272000	400	36	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴
Strontium	2220	5.0	0.12	ug/l	1	05/09/14	05/09/14 KV	EPA 200.7 ¹	EPA 200.7 ⁴

- (1) Instrument QC Batch: MA4747
- (2) Instrument QC Batch: MA4783
- (3) Prep QC Batch: MP12878
- (4) Prep QC Batch: MP12880

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: TRIP BLANK		Date Sampled: 05/07/14
Lab Sample ID: D57542-2		Date Received: 05/08/14
Matrix: AQ - Trip Blank Water		Percent Solids: n/a
Method: SW846 8260B		
Project: WWLCOGJ: GM 323-28 BWQ		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	7V26339.D	1	05/08/14	JL	n/a	n/a	V7V1448
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	94%		62-130%
2037-26-5	Toluene-D8	96%		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

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Misc. Forms

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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: D57542
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
V7V1448-MB	7V26335.D	1	05/08/14	JL	n/a	n/a	V7V1448

The QC reported here applies to the following samples:

Method: SW846 8260B

D57542-1, D57542-2

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	98%	62-130%
2037-26-5	Toluene-D8	93%	70-130%
460-00-4	4-Bromofluorobenzene	97%	69-130%

Blank Spike Summary

Job Number: D57542
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
V7V1448-BS	7V26336.D	1	05/08/14	JL	n/a	n/a	V7V1448

The QC reported here applies to the following samples:

Method: SW846 8260B

D57542-1, D57542-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	52.4	105	70-130
100-41-4	Ethylbenzene	50	50.8	102	70-130
108-88-3	Toluene	50	48.9	98	70-130
1330-20-7	Xylene (total)	150	153	102	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	97%	62-130%
2037-26-5	Toluene-D8	93%	70-130%
460-00-4	4-Bromofluorobenzene	104%	69-130%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D57542
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
V7V1448-BS	7V26337.D	1	05/08/14	JL	n/a	n/a	V7V1448

The QC reported here applies to the following samples:

Method: SW846 8260B

D57542-1, D57542-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1840	84	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	91%	62-130%
2037-26-5	Toluene-D8	94%	70-130%
460-00-4	4-Bromofluorobenzene	100%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D57542
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
D57587-5MS	7V26351.D	5	05/08/14	JL	n/a	n/a	V7V1448
D57587-5	7V26350.D	5	05/08/14	JL	n/a	n/a	V7V1448

The QC reported here applies to the following samples:

Method: SW846 8260B

D57542-1, D57542-2

CAS No.	Compound	D57587-5 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
71-43-2	Benzene	605	250	904	120	62-130	
100-41-4	Ethylbenzene	66.7	250	333	107	63-130	
108-88-3	Toluene	28.4	250	283	102	60-130	
1330-20-7	Xylene (total)	131	750	923	106	67-130	

CAS No.	Surrogate Recoveries	MS	D57587-5	Limits
17060-07-0	1,2-Dichloroethane-D4	95%	94%	62-130%
2037-26-5	Toluene-D8	92%	95%	70-130%
460-00-4	4-Bromofluorobenzene	102%	98%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D57542
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
D57587-5MS	7V26352.D	5	05/08/14	JL	n/a	n/a	V7V1448
D57587-5	7V26350.D	5	05/08/14	JL	n/a	n/a	V7V1448

The QC reported here applies to the following samples:

Method: SW846 8260B

D57542-1, D57542-2

CAS No.	Compound	D57587-5 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	2170	11000	11700	87	19-168

CAS No.	Surrogate Recoveries	MS	D57587-5	Limits
17060-07-0	1,2-Dichloroethane-D4	90%	94%	62-130%
2037-26-5	Toluene-D8	96%	95%	70-130%
460-00-4	4-Bromofluorobenzene	102%	98%	69-130%

* = Outside of Control Limits.

Duplicate Summary

Job Number: D57542
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
D57582-10DUP ^a	7V26345.D	100	05/08/14	JL	n/a	n/a	V7V1448
D57582-10 ^a	7V26344.D	100	05/08/14	JL	n/a	n/a	V7V1448

The QC reported here applies to the following samples:

Method: SW846 8260B

D57542-1, D57542-2

CAS No.	Compound	D57582-10 ug/l	DUP Q	DUP ug/l	Q	RPD	Limits
71-43-2	Benzene	11700		11500		2	30
100-41-4	Ethylbenzene	3470		3420		1	30
108-88-3	Toluene	3050		2950		3	30
1330-20-7	Xylene (total)	12400		12100		2	30
	TPH-GRO (C6-C10)	65100		61900		5	30

CAS No.	Surrogate Recoveries	DUP	D57582-10	Limits
17060-07-0	1,2-Dichloroethane-D4	91%	94%	62-130%
2037-26-5	Toluene-D8	95%	94%	70-130%
460-00-4	4-Bromofluorobenzene	98%	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: D57542
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
GFB508-MB	FB11108.D	1	05/08/14	JS	n/a	n/a	GFB508

The QC reported here applies to the following samples:

Method: RSK175 MOD

D57542-1

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: D57542
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
GFB508-BS	FB11109.D	10	05/08/14	JS	n/a	n/a	GFB508

The QC reported here applies to the following samples:

Method: RSK175 MOD

D57542-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.608	119	70-130
74-84-0	Ethane	0.956	1.04	109	70-130
74-98-6	Propane	1.4	1.52	108	67-130

7.2.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D57542
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
D57479-1MS	FB11111.D	10	05/08/14	JS	n/a	n/a	GFB508
D57479-1MSD	FB11112.D	10	05/08/14	JS	n/a	n/a	GFB508
D57479-1	FB11110.D	1	05/08/14	JS	n/a	n/a	GFB508

The QC reported here applies to the following samples:

Method: RSK175 MOD

D57542-1

CAS No.	Compound	D57479-1		MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
		mg/l	Q							
74-82-8	Methane	0.00040		0.512	100	0.51	0.511	100	0	51-155/30
74-84-0	Ethane	ND		0.893	93	0.956	0.897	94	0	58-130/30
74-98-6	Propane	ND		1.33	95	1.4	1.35	96	1	46-130/30

* = 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: D57542
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
OP9893-MB	FD31266.D	1	05/13/14	JS	05/13/14	OP9893	GFD1503

The QC reported here applies to the following samples:

Method: SW846-8015B

D57542-1

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	50% 10-130%

Blank Spike Summary

Job Number: D57542
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
OP9893-BS	FD31268.D	1	05/13/14	JS	05/13/14	OP9893	GFD1503

The QC reported here applies to the following samples:

Method: SW846-8015B

D57542-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	1.67	33	33-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	46%	10-130%

8.2.1
8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D57542
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
OP9893-MS	FD31270.D	1	05/13/14	JS	05/13/14	OP9893	GFD1503
OP9893-MSD	FD31272.D	1	05/13/14	JS	05/13/14	OP9893	GFD1503
D57451-13	FD31274.D	1	05/13/14	JS	05/13/14	OP9893	GFD1503

The QC reported here applies to the following samples:

Method: SW846-8015B

D57542-1

CAS No.	Compound	D57451-13 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	2.32	46	5	1.20	24* a	64* b	33-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D57451-13	Limits
84-15-1	o-Terphenyl	67%	31%	46%	10-130%

- (a) Outside control limits due to possible matrix interference.
- (b) High RPD due to possible sample nonhomogeneity.

* = 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: D57542
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12878
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 05/09/14

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	0.059	<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 MP12878: D57542-1F

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: D57542
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12878
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 05/09/14

Metal	D57450-1F Original MS	SpikeLot ICPAL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	0.36	205	200	102.3 70-130
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP12878: D57542-1F

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: D57542
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12878
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 05/09/14

Metal	D57450-1F Original MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	0.36	198	200	98.8	14.6	20
Silver	anr					
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP12878: D57542-1F

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

9.12
9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D57542
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12878
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 05/09/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	214	200	107.0	85-115
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP12878: D57542-1F

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: D57542
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12880
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/09/14

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	0.10	<10
Beryllium	10	.8	1.7		
Boron	50	6.7	6.6	0.20	<50
Cadmium	10	.4	.36		
Calcium	400	2.2	66	12.4	<400
Chromium	10	.4	1.4		
Cobalt	5.0	.4	.51		
Copper	10	1.2	1.5		
Iron	10	2.2	3.2	3.3	<10
Lead	50	3.6	4.1		
Lithium	5.0	1.9	1.9		
Magnesium	200	14	29	2.8	<200
Manganese	5.0	.01	.29	0.0	<5.0
Molybdenum	10	.8	1.1		
Nickel	30	.9	.87		
Phosphorus	100	15	24		
Potassium	1000	130	230	2.4	<1000
Selenium	50	8.8	9.3		
Silicon	50	5.2	5.6		
Silver	30	.4	.4		
Sodium	400	4.9	36	29.0	<400
Strontium	5.0	.01	.12	0.10	<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 MP12880: D57542-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D57542
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

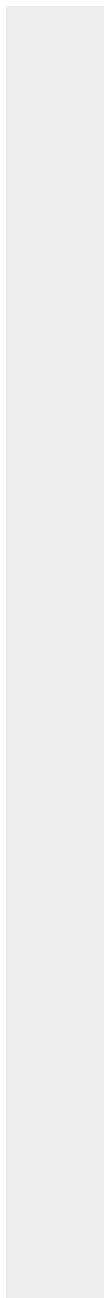
QC Batch ID: MP12880
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/09/14

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



9.2.1
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57542
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12880
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 05/09/14

Metal	D57351-1F Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	62.2	2090	2000	101.4	70-130
Beryllium					
Boron	20.9	1080	1000	105.9	70-130
Cadmium					
Calcium	39100	62100	25000	92.0	70-130
Chromium					
Cobalt					
Copper					
Iron	14.5	4950	5000	98.7	70-130
Lead					
Lithium					
Magnesium	9590	34200	25000	98.4	70-130
Manganese	0.60	490	500	97.9	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	1650	27300	25000	102.6	70-130
Selenium					
Silicon					
Silver					
Sodium	47600	71900	25000	97.2	70-130
Strontium	593	1080	500	97.4	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP12880: D57542-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57542
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

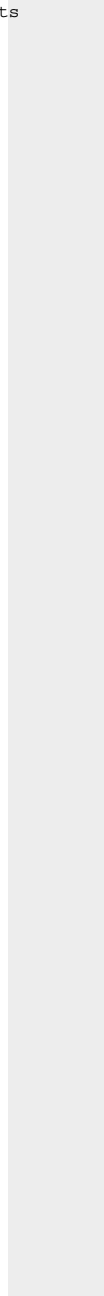
QC Batch ID: MP12880
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/09/14

Metal	D57351-1F Original MS	SpikeLot ICPALL2	% Rec	QC Limits
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(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested



9.2.2
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57542
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12880
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 05/09/14

Metal	D57351-1F Original MSD		SpikeLot ICPAL2 % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	62.2	2160	2000	104.9	3.3	20
Beryllium						
Boron	20.9	1100	1000	107.9	1.8	20
Cadmium						
Calcium	39100	63400	25000	97.2	2.1	20
Chromium						
Cobalt						
Copper						
Iron	14.5	5090	5000	101.5	2.8	20
Lead						
Lithium						
Magnesium	9590	35000	25000	101.6	2.3	20
Manganese	0.60	497	500	99.3	1.4	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	1650	28100	25000	105.8	2.9	20
Selenium						
Silicon						
Silver						
Sodium	47600	74500	25000	107.6	3.6	20
Strontium	593	1120	500	105.4	3.6	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP12880: D57542-1F

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: D57542
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

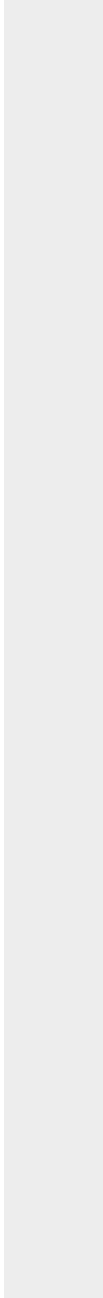
QC Batch ID: MP12880
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/09/14

Metal	D57351-1F 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



9.2.2
9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D57542
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC
 Project: WWLCOGJ: GM 323-28 BWQ

QC Batch ID: MP12880
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 05/09/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	2060	2000	103.0	85-115
Beryllium				
Boron	1060	1000	106.0	85-115
Cadmium				
Calcium	25200	25000	100.8	85-115
Chromium				
Cobalt				
Copper				
Iron	5000	5000	100.0	85-115
Lead				
Lithium				
Magnesium	25300	25000	101.2	85-115
Manganese	504	500	100.8	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	26000	25000	104.0	85-115
Selenium				
Silicon				
Silver				
Sodium	25900	25000	103.6	85-115
Strontium	507	500	101.4	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP12880: D57542-1F

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: D57542
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 323-28 BWQ

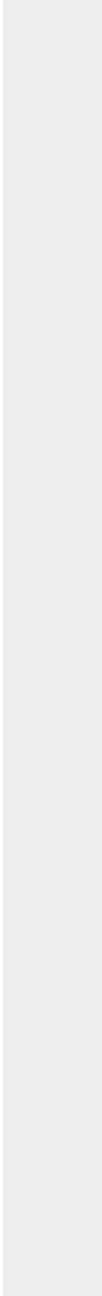
QC Batch ID: MP12880
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/09/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
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(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: D57542
Account: WILLCOOP - 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	GN24646	5.0	2.5	mg/l	100	100	100.3	90-110%
Alkalinity, Carbonate	GN24647	5.0	0.0	mg/l	100	100	100.3	80-120%
Alkalinity, Total as CaCO3	GN24645	5.0	2.5	mg/l	100	100	100.3	90-110%
Bromide	GP12530/GN24617	0.050	0.0	mg/l	0.5	0.511	102.2	90-110%
Chloride	GP12530/GN24617	0.50	0.0	mg/l	5	4.74	94.8	90-110%
Fluoride	GP12530/GN24617	0.10	0.0	mg/l	1	1.03	103.0	90-110%
Iron Reducing Bacteria	MB365	25	<25	CFU/ml				
Nitrogen, Nitrate	GP12530/GN24617	0.010	0.0	mg/l	0.1	0.103	103.0	90-110%
Nitrogen, Nitrite	GP12530/GN24617	0.0040	0.0	mg/l	0.05	0.0520	104.0	90-110%
Phosphorus, Total	GP12573/GN24694	0.010	0.0	mg/l	0.38	0.37	97.1	80-120%
Slime Forming Bacteria	MB366	500	<500	CFU/ml				
Solids, Total Dissolved	GN24686	10	0.0	mg/l	400	399	99.8	90-110%
Specific Conductivity	GP12559/GN24682			umhos/cm	101	101	101.0	90-110%
Sulfate	GP12530/GN24617	0.50	0.0	mg/l	5	4.93	98.6	90-110%
Sulfate Reducing Bacteria	MB367	200	<200	CFU/ml				
pH	GN24623			su	8.00	7.99	99.9	99.3-100.7%

Associated Samples:

- Batch MB365: D57542-1
- Batch MB366: D57542-1
- Batch MB367: D57542-1
- Batch GN24623: D57542-1
- Batch GN24645: D57542-1
- Batch GN24646: D57542-1
- Batch GN24647: D57542-1
- Batch GN24686: D57542-1
- Batch GP12530: D57542-1
- Batch GP12559: D57542-1
- Batch GP12573: D57542-1

(*) Outside of QC limits

10.1
10

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D57542
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	GN24645	D57430-4	mg/l	501	503	0.4	0-20%
Phosphorus, Total	GP12573/GN24694	D57458-1	mg/l	0.017	0.019	11.1	0-20%
Solids, Total Dissolved	GN24686	D57539-1	mg/l	250	258	3.1	0-20%
Specific Conductivity	GP12559/GN24682	D57452-1	umhos/cm	1150	1140	0.7	0-20%

Associated Samples:

Batch GN24645: D57542-1

Batch GN24686: D57542-1

Batch GP12559: D57542-1

Batch GP12573: D57542-1

(*) Outside of QC limits

10.2
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MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D57542
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	GN24645	D57409-1	mg/l	961	100	380	88.4	80-120%
Bromide	GP12530/GN24617	D57520-2	mg/l	0.0	0.5	0.52	104.0	80-120%
Chloride	GP12530/GN24617	D57520-2	mg/l	1.5	5	6.3	96.0	80-120%
Fluoride	GP12530/GN24617	D57520-2	mg/l	0.15	1	1.2	105.0	80-120%
Nitrogen, Nitrate	GP12530/GN24617	D57520-2	mg/l	0.044	0.1	0.15	106.0	80-120%
Nitrogen, Nitrite	GP12530/GN24617	D57520-2	mg/l	0.0	0.05	0.053	106.0	80-120%
Phosphorus, Total	GP12573/GN24694	D57458-1	mg/l	0.017	0.40	0.43	103.3	80-120%
Sulfate	GP12530/GN24617	D57520-2	mg/l	8.1	5	13.2	102.0	80-120%

Associated Samples:

Batch GN24645: D57542-1

Batch GP12530: D57542-1

Batch GP12573: D57542-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D57542
Account: WILLCOP - 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	GN24645	D57409-1	mg/l	961	100	381	0.2	20%
Bromide	GP12530/GN24617	D57520-2	mg/l	0.0	0.5	0.52	0.0	20%
Chloride	GP12530/GN24617	D57520-2	mg/l	1.5	5	6.3	0.0	20%
Fluoride	GP12530/GN24617	D57520-2	mg/l	0.15	1	1.2	0.0	20%
Nitrogen, Nitrate	GP12530/GN24617	D57520-2	mg/l	0.044	0.1	0.15	0.0	20%
Nitrogen, Nitrite	GP12530/GN24617	D57520-2	mg/l	0.0	0.05	0.053	0.0	20%
Phosphorus, Total	GP12573/GN24694	D57458-1	mg/l	0.017	0.40	0.430	0.0	20%
Sulfate	GP12530/GN24617	D57520-2	mg/l	8.1	5	13.2	0.0	20%

Associated Samples:

Batch GN24645: D57542-1

Batch GP12530: D57542-1

Batch GP12573: D57542-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4
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