Western Water & Land, Inc.

August 15, 2014, 2014

Mr. Michael Gardner
WPX Environmental Manager North West
WPX Energy Rocky Mountain LLC
1058 County Road 215
Parachute, Colorado 81635

RE: GM 21-12 Drill Pad Baseline Results Report, May 2014 Event

Dear Mr. Gardner,

Western Water & Land, Inc. (WWL) has completed baseline water quality sampling for the WPX Energy Rocky Mountain LLC (WPX) GM 21-12 Drill Pad in accordance with the Colorado Oil and Gas Conservation Commission (COGCC) Rule 609. The GM 21-12 Drill Pad is located in the NE¼, NW¼, Section 12, Township 7 South, Range 96 West, 6th PM.

In accordance with Rule 609, the baseline water quality evaluation considered all water sources (domestic wells or springs) within a 0.5-mile radius of the referenced drill pad (oil and gas location). A preliminary screening of the groundwater sources was completed to identify the sources that are potentially available for sampling pending the consent of the structure owners. Each potentially Available Water Source was then evaluated to identify the preferred sources for the baseline program. If the number of potentially available sources was four or less, all of the sources were included in the list of preferred sources. If more than four sources were potentially available, the sources were prioritized based on WWL's hydrologic expertise and in accordance with Rule 609. A complete description of the water source evaluation process and results are provided in the water source evaluation report (GM 21-12 Drill Pad Baseline Water Quality Evaluation, February 26, 2014).

This report summarizes the selection of sampling locations and associated field sampling activities, and the quality control and water chemistry results.

SAMPLING LOCATIONS AND FIELD ACTIVITIES

As described in the GM 21-12 Drill Pad Baseline Water Quality Evaluation, February 26, 2014, six potential sampling locations were identified for field sampling of water quality consistent with requirements of Rule 609. Through the use of state records, the landowners, water well permit holders or water right holders were mailed access request letters by way of certified U.S. Postal Service mail. Four wells were identified as preferred sampling locations:

- Water Well Permit No. 47306
- Water Well Permit No. 61754-F (Well Status Unknown)
- Water Well Permit No. 47732

- Water Well Permit No. 193647 (Well Status Unknown)

After attempting to contact landowners, water well permit holders, and water right holders, sampling access was not acquired at any of the preferred sampling locations within the 30-day response period. WPX was granted access to sample alternate water source Water Well Permit No. 47731.

One sample was collected for the GM 21-12 Drill Pad as shown in the table below.

Sampling Date	Well Identification or Permit No.	Sample Identification	COGCC Facility ID	Comment
5/13/2014	47731	Orona 47731	703040	None

The water sample was collected from an outdoor spigot attached to the front of the house. According to the home occupant, there was no water treatment system or storage tank in use upstream of the sampling point. WPX Land Representative Mr. Gary Reed and Ms. Sarah Orona were present when sample Orona 47731 was collected.

See Figure 1 for the sample location. Photographs of the sampling site are shown in Attachment A. Field monitoring forms are shown in Attachment B.

All sampling procedures followed protocols in the COGCC Model Sampling and Analysis Plan (SAP) as adapted and modified by WPX. Sampling Method 1 for wells with pumps and effervescent samples, described in Version 1 of the COGCC Model SAP, was used to collect the sample.

The sample was relinquished to the analytical laboratory's (Accutest Mountain States [AMS], Wheat Ridge, Colorado) courier in Rifle, Colorado, who carefully packed the sample in a cooler with ice for preservation and shipped it to the analytical laboratory by way of private overnight courier.

QUALITY CONTROL SUMMARY

WWL conducted a Tier 1 data validation quality control evaluation of the received analytical laboratory data report. Attachment C presents detailed information on the quality control evaluation for field sampling and laboratory analysis associated with the collected samples.

AMS reported that all analytes were within control criteria for matrix spikes, matrix spike duplicates, duplicate relative percent difference, and laboratory control samples. AMS did not assign qualifiers to the analytical results.

AMS Laboratory assigned analytical results that were undetected with a "U" qualifier and "J" qualifier to results that were detected above the method detection limit but below the reporting limit to indicate the result value is estimated. WWL assigned an "H" qualifier to results that exceeded analytical holding times to indicate the result value is estimated. See Attachment C and Attachment D for individual parameters that were qualified.

ANALYTICAL RESULTS

Laboratory analysis was performed by Accutest Mountain States Laboratory (AMS), in Wheat Ridge, Colorado in accordance with the analytical schedule described in Rule 609 with some deviations in

analytical methods. The analytical methods used are considered valid and provide quality results. The analytical results are summarized in Attachment D; the data are qualified as indicated. The full laboratory analytical report is presented in Attachment E.

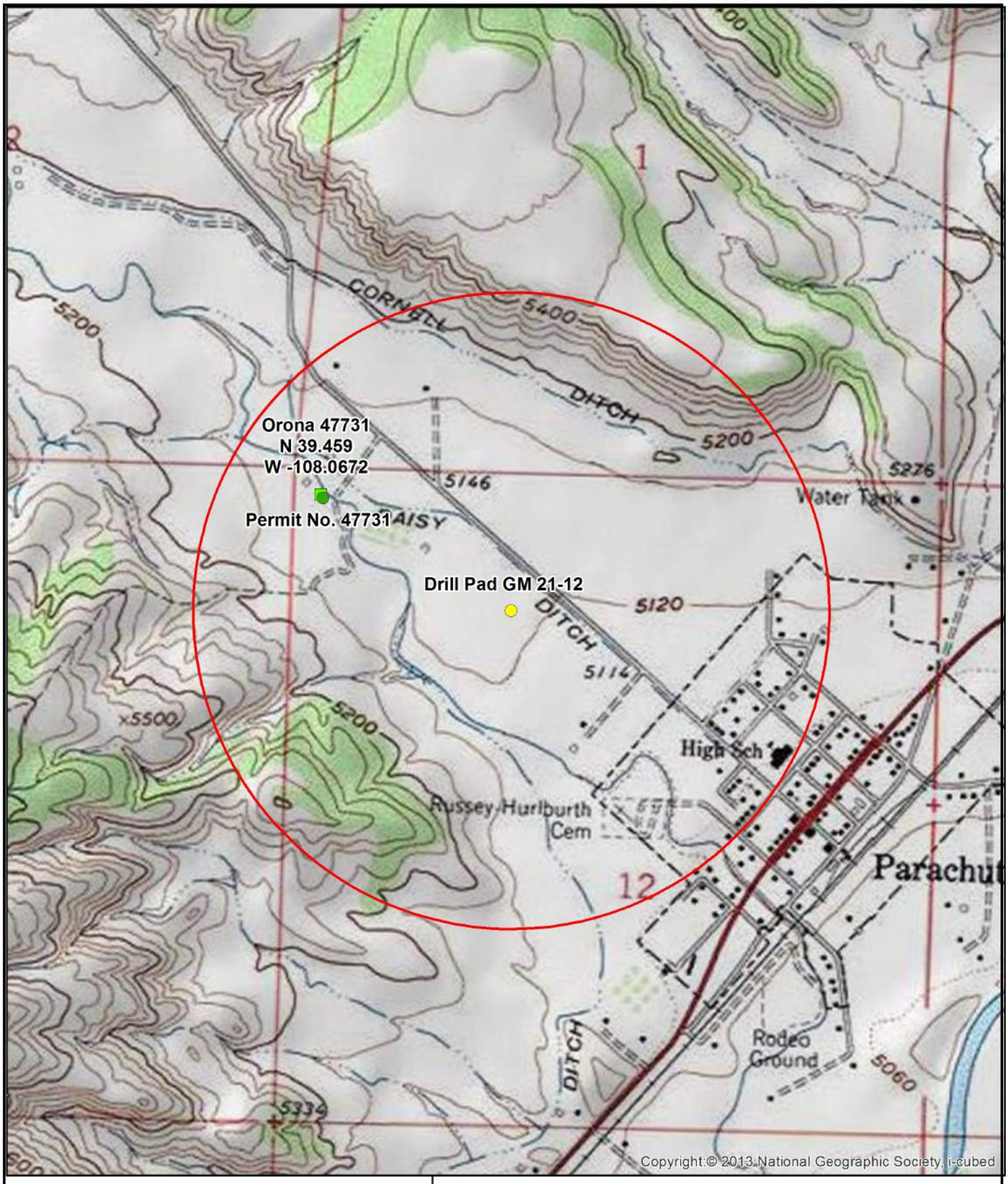
If you have any questions or concerns, please contact me at (970) 242-0170.

Sincerely,

Bruce D. Smith
Principal Hydrogeologist
WESTERN WATER & LAND, INC.

Attachments

Figure 1- Sampling Location Map
Attachment A - Photographs
Attachment B - Field Monitoring Forms
Attachment C - Data Quality Evaluation
Attachment D - Summary of Analytical Results
Attachment E - Laboratory Analytical Summary Report



Legend

- Sample Location(s)
- Decree
- Constructed well
- Drill Pad GM 21-12
- 0.5-Mile Radius Evaluation Area

N

Feet

1,000 500 0 1,000

1:13,000

Figure 1: GM 21-12 Sample Location Map
COGCC Rule 609 Baseline Sampling
NE1/4, NW1/4, S12, T7S, R96W, 6 PM

Garfield County, Colorado

WPX Energy Rocky Mountain LLC

Basemap Source: Bing Maps and Esri ArcGIS Online

Western Water & Land, Inc.
Applications in Earth Science

ATTACHMENT A

Photographs

Photo 1. Lindauer Well Sampling Location (Orona 47731)

Photo 2. Lindauer Well in Basement of Orona's Household (Orona 47731)

ATTACHMENT B

Field Monitoring Forms

WPX BWQ Groundwater Monitoring Field Form

Project Information			
Project:	GM 21-12 BWQ	Sample Purpose:	Rule 609 Baseline
Site Name (Well Pad):	GM 21-12	Site API:	05-045-07778
Station Name:	LINDAUER, 47731	Sample Date:	5-13-14
COGCC Facility ID:	703040	Start Time:	1330
Field Sample ID:	Orona 47731	End Time:	1530
* Landowner Name:	Lindauer Family Trust	Sample Time:	1450
Landowner Address:	PO Box 1626, Parachute, CO	Sample Team:	SLK, NWS
Water Right/Well Owner:	Bessie Lindauer	Observer:	SLK
Water Right/Well Permit:	47731	Lead Signature/Date:	S. Kupp 5-15-14
Receipt Number:	9114132		

Station Information				
Station Description:	Hose bib off front of house.			
Approximate Distance to Well Pad:	0.37 miles			
Station Type:	(Well) / Spring / Seep / Other:	Water Use:	(Domestic) / Irrigation /	
Sampling Location:	Kitchen Tap / Pipe / Well House / (Hose bib) / Other:			
* GPS Location:	Zone	x -108.06718	y 39.45948	z 5208
Total Depth (ft):	50	Static Depth to Water (ft):	7.25	Well diameter (in): 4
Purge Volume (gal)	27.9	Total Volume Purged (gal)	114.7	

Weather Conditions			
Sky:	(Clear) / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	50
Precipitation:	(None) / Light / Moderate / Heavy	Precip Type:	(None) / Rain / Sleet / Hail / Snow
Wind:	Calm / Light / (Mod) / Strong	Wind Speed/Direction:	

Field Measurements

Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	10.04	1514		YSI 556	Container	
pH	s.u.	7.06	↓		↓	↓	
Sp. Conductivity	uS/cm	1377					
Conductivity	uS/cm	982					
DO Saturation	%	40.7					
DO	mg/L	4.58					
Baro Press	mmHg	637.1					
ORP	RmV	122.4					
Turbidity	NTU	0.31		AV			0.54, 0.19, 0.21
Discharge	gpm	2.5		VAR			
H2S	mg/L	NM					

Color:	(Clear) / White / Yellow / Brown / Green / Blue / Other	(Light) / Med / Dark	
Odor:	(None) / Mild / Mod / Strong		
Effervescence:	(None) / Mild / Mod / Strong	Bubbles:	(None) / Low / Mod / High
Sediment:	(None) / Light / Mod / Heavy	VOA Headspace:	(None) / ≤ Pea Size / ≥ Pea Size
Lab Analysis:	(Rule 609) / COA 9 / COA 22 / Other		
Field Filtered:	Yes / (No)	Filter Size: NA	No. Filters used: NA

Flag Codes: NM (not measured), E (estimated), N/A (not applicable), I (insufficient sample), Q (uncertain value), Y (calculated value), AV (averaged value), EC (exceeds calibration range), OT (other flag to be defined later), NS (not stabilized), VAR (variable)

WPX BWQ Groundwater Monitoring Field Form

Landowner Comments on water quality:

None. This is an old well and has produced very well. Well is in basement of house, sample taken from an outdoor spicket attached to house. No treatment system or storage tanks in place.

Additional information:

1400: discharge 1.5 gpm
1404: discharge 2.25 gpm

* GPS marked waypoint in is wrong location. Correct coordinates: 39.459, -108.0672. Correct landowner: Sarah & Howard Orona. Landowner address: 929 CR 215, Parachute, CO 81635.

Gary Reed & Sarah Orona present for sample.

Calibration info on Germano, 55881-F

Calibration Information			Date: 5-13-14			Location: WWL office		
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
	pH	s.u.						
	pH	s.u.						
	pH	s.u.						
	SpC	uS/cm						
	SpC	uS/cm						
	DO	%						
	DO	%						
	ORP	RmV						
	Turbidity	NTU						

WPX BWQ Groundwater Monitoring Field Form

Well Purging Information

Date: 5-13-14	Purge Method: 3 casing volumes & parameter stabilizatio	
Total Depth, ft (d_t): 50	Static Depth to Water, ft (d_w): 7.25	Sample/Set Depth (ft):
Casing Radius (in): 2		
Total Volume (gal or ft^3): 27.90	Total Volume x 3 (gal or ft^3): 83.7	

1 ft^3 = 7.48 gal

Casing Volume = $\pi r^2(d_t - d_w)$ 42.75

$\pi \left(\frac{2}{12}\right)^2 (50 - 7.25) = 8.73 ft^3 \cdot 7.48 \frac{gal}{ft^3} = 27.90$

Purge #	Time	Temp (deg C)	pH (s.u.)	SpC (uS/cm)	Cond (uS/cm)	DO (%)	DO (mg/L)	ORP (RmV)	Water Clarity (Poor/Mod/ Good) or NTUs	Efferves-cence (None /Slight/ Mod/Heavy)	Volume Purged (gal)	Cum Vol Purged (gal)
0	1400										1699.7	
1	1405	9.99	7.01	1374	980	44.9	5.03	114.6	1.95	NONE	1701.1	1.4
2	1410	9.69	7.03	1375	973	44.0	4.97	109.7	1.23	NONE	1714.3	14.6
3	1415	9.83	7.03	1375	977	42.3	4.77	107.9	0.25	NONE	1729.3	29.6
4	1420	9.87	7.02	1376	978	41.4	4.67	108.8	0.26	NONE	1741.7	42
5	1425	9.87	7.02	1376	979	40.9	4.61	107.6	0.18	NONE	1755.3	55.6
6	1430	9.87	7.03	1374	977	39.9	4.49	114.5	0.08	NONE	1766.5	66.8
7	1435	9.50	7.03	1377	969	40.1	4.56	115.7	0.33	NONE	1777.5	77.8
8	1440	9.79	7.05	1378	978	43.7	4.93	109.9	0.26	NONE	1792.1	90.4
9	1445	9.91	7.03	1379	981	41.1	4.63	108.5	0.33	NONE	1802.1	102.4
10	1450	9.75	7.03	1379	978	40.1	4.53	110.8	0.15	NONE	1814.4	114.7
		✓	✓	✓		✓		✓	✓			

1355: WL BTOC 7.25'

ATTACHMENT C

Data Quality Evaluation

QUALITY CONTROL EVALUATION

Quality control measures consisted of a review of field sampling procedures and the analytical laboratory quality control data. Laboratory quality control information was reviewed and checked for consistency in meeting acceptance criteria and the assignment of data qualifiers. In addition, WWL conducted quality control evaluations of cation-anion balance (CAB) and total dissolved solids (TDS) calculated versus measured ratio. WWL assigned additional qualifiers to analytical results as necessary.

Field Procedures

WWL conducted field sampling procedures in accordance with the COGCC Model SAP as modified by WPX. All samples were collected by direct filling methods; dissolved gas sampling was done using Method 1 for wells with pumps and effervescent samples. No field procedure deviations occurred that were cause for data qualification.

COC

The chain-of-custody forms were reviewed for correct and complete sample IDs, requested analysis, and other pertinent information. The analytes requested on the COCs matched the requirements of Rule 609. DRO (diesel range organics) and GRO (gasoline range organics) were designated on the COCs in place of TPH, a required analysis for Rule 609. No other errors or quality control issues were observed, and no corrections were needed.

Sample Receipt

Samples were received by AMS in three coolers within the temperature range criteria (4°C ± 2°C). Custody seals were intact. No quality control issues were reported on the sample receipt form. No qualifiers were assigned to results based on sample receipt conditions.

Holding Times

Laboratory pH was analyzed out of holding time for all samples; WWL assigned an "H" qualifier to indicate the results are estimated. All other analyses were conducted within recommended holding times.

Analytical Methods

The analytical methods used by AMS were checked for consistency with the analytical schedule in the SAP. Analytical methods were found to be consistent with the following modifications: Gasoline Range Organics (TPH volatiles) were analyzed using Method SW8260B. Diesel Range Organics (TPH extractables) were analyzed according to Method SW846-8015B.

Detection Limits

Detection limits provided with the analytical results were compared to the original quoted detection limits from the analytical laboratory. Detection limits were as quoted with no deviations observed except as applied to increased dilution factors.

Sample Orona 47731: A dilution factor of 20 was applied to sulfate and nitrate as N; a dilution factor of 2 for bromide, chloride, fluoride, nitrite as N, and selenium; and a dilution factor of 1 for all other analytes. Detection limits for nitrite were elevated due to matrix interference.

AMS reports sample results at the MDL as "undetected" or "U" rather than reporting results as less than the reporting or detection limit, e.g. < 0.05µg/L.

Completeness

Data completeness is a measure of requested analysis and received results. The analytical constituents required under Rule 609 were compared to those requested and analyzed in the laboratory reports. Qualified data are included as analyzed data. No data were rejected for field or analytical reasons. WWL separately designated

DRO (Diesel Range Organics) and GRO (Gasoline Range Organics) for the TPH analysis required in Rule 609. All requested analytical data matched the laboratory reported data results; data completeness is considered 100 percent.

Cation-Anion Balance
The cation-anion balance (CAB) calculates the total charge of positively charged ions and the total charge of the negatively charged ions. It is a measure of the quality of the analysis; if the charge is not balanced, an error may exist in the analysis. CAB percent difference calculations were performed for each sample; if the CAB exceeded ± 5%, i.e. less than 95% or greater than 105%, the analytical results data may be qualified as estimated.

In general, WWL will assign a qualifier (estimated result) for a CAB equal to or greater than plus or minus 10%, and may assign a qualifier for CAB percentages between plus or minus 5% and less than 10%. The final CAB calculations for the samples are as follows:

- Orona 47731: 1.913%

The analytical results for cations and anions for the samples were not qualified on the basis of the CAB. See Attachment C, Data Quality Review Sheets.

TDS
The ratio of laboratory-measured TDS versus calculated TDS were computed; sample ratios less than 0.80 and greater than 1.20 are cause for a review of major ion reporting errors. In general, WWL will assign a qualifier (an estimated result) when TDS ratios are less than or equal to 0.5 and equal to or greater than 1.5, and may assign a qualifier for TDS ratios greater than 0.5 and less than 0.8 and greater than 1.2 and less than 1.5. The TDS calculations for samples are as follows:

- Orona 47731: 1.15

No sample results were rejected or qualified on the basis of the TDS acceptance criteria.

Field Duplicates
Field duplicates evaluate the precision of analytical results for field samples collected for a specific sampling event. Precision is measured by the calculation of the relative percent difference (RPD) using the analytical results from the original investigative sample and the duplicate sample. An RPD limit of 35% is used for the data qualification criterion. When the original sample has a detected concentration above the reporting limit (RL) and the concentration of the field duplicate is less than the RL, the calculation of a field duplicate RPD is not applied. For sample results less than 5 times the RL, the acceptance criteria is ± RL.

No field duplicates were collected for this sampling event, therefore no RPDs were calculated..

Trip Blanks
Trip blanks are analyte-free matrix (water in this case) samples supplied by the analytical laboratory that are shipped inside the sample shipping containers to and from the field investigation site. Field blanks test for potential contamination during shipping and sampling field procedures. For this project, field blanks are analyzed for volatiles only. There was no trip blank associated with sample Orona 47731.

Laboratory Quality Control
The analytical laboratory conducts an extensive quality control program and as part of the overall quality control process. The analytical laboratory quality control program includes the use of various laboratory quality control samples including but not limited to: method blanks (MB), laboratory control samples (LCS) and duplicates

(LCSD), matrix spikes (MS) and duplicates (MSD), surrogates, initial calibration verification standards (ICVs), and continuing calibration verification standard (CCVs).

WWL verified that the lab performed and reported quality control data correctly. This included checking laboratory control samples data for meeting laboratory QC limits, acceptance criteria, and recovery limits. QC limits associated with the relative percent difference (RPD) between duplicate samples typically range from a limit of 20% for metals and general or wet chemistry to 30% for organic analytes. Typical percent recovery acceptance limits are 80 to 120% for metals and wet chemistry and 70 to 130% for organics; some organic compounds may have much broader recovery limits.

All sampling event data packages showed that no laboratory control samples exceeded the QC limits or acceptance criteria without data qualification, and no recovery limits were exceeded without qualification. No qualifiers were assigned to the results.

Accuracy

Accuracy was evaluated as a percent recovery of an analyte in a reference standard or a spiked sample, e.g. matrix spike and matrix spike duplicate. In cases where percent recoveries exceeded the laboratory acceptance criteria, data would be qualified depending on whether the analyte was detected above the method detection limit (MDL) or not, if the recovery of the associated control sample was acceptable, or if the analyte concentration in the sample was disproportionate to the spike level and that the recovery of the associated control sample was acceptable. Note that the analytical laboratory may not have selected a sample from this field investigation for testing matrix quality control samples. In these cases, true matrix affects cannot be assessed and the resulting data should be considered as estimated. This will be noted in the DQR sheets (Attachment C), but the data will not be broadly qualified by WWL.

AMS did not choose sample Orona 47731 for testing matrix quality control; AMS selected a number of other samples for MS and MSD based on the analytical methods being used. The MS and MSD recoveries met guidance criteria for precision and accuracy for all analytes.

No qualifiers were assigned to the results by the lab. WWL did not assign additional qualifiers to the analytical results.

Precision

Precision is the measurement of how closely replicate sample constituents agree and is not related to the true value (concentration). Precision is measured using RPD calculations for laboratory duplicate samples such as LCSD and MSD samples and any other duplicate samples generated by the laboratory. The RPDs were compared to the laboratory acceptance limit of 20% for metals and general or wet chemistry and 30% for organic analytes. RPDs were not used when the sample concentration was too low (< 10X MDL) for accurate evaluation.

All RPDs met acceptance criteria. No qualifiers were assigned by the laboratory because of RPD values exceeding the laboratory acceptance criteria.

Data Quality Review Sheets are presented within this Attachment.

DATA QUALITY REVIEW SHEET

Facility ID:	703040	Project:	WPX BWQ: GM 21-12 609 Base
Station Name:	Lindauer 47731	Lab Work Order:	D57717
Sample Date:	5/13/14	QA/QC Review Date:	7/15/14
Field Sample ID:	Orona 47731	Reviewer:	J. Pahler

Field Sampling Data Review	**Yes**	**No**	**N/A**
1. Well properly purged?	☒	☐	☐
2. Flow rate reduced prior to sampling?	☒	☐	☐
3. Water quality parameters stable prior to sampling?	☒	☐	☐
4. Field instruments calibrated properly?	☒	☐	☐
5. Sampling methods performed according to SAP procedures?	☒	☐	☐
6. Procedures consistent with obtaining a representative sample?	☒	☐	☐
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	☒	☐	☐
8. Receipt form is without discrepancies? *If no, list in comments.*	☒	☐	☐
9. All samples analyzed for the requested analyses?	☒	☐	☐
10. Proper laboratory methods used?	☒	☐	☐
11. All sample holding times met (other than lab pH)?	☒	☐	☐
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	☒	☐	☐
13. Was the field investigation sample matrix used by the lab for matrix QC for all analyses?	☐	☒	☐
14. Laboratory qualifiers for data (other than non-detect)? *List in comments*.	☒	☐	☐
15. Additional qualifiers assigned (other than pH)?	☐	☒	☐
16. Are corrective actions required? *If yes, list actions and dates to be completed by:*	☐	☒	☐
Corrective Action	*Date to be completed*		

Calculated Parameters	**Calculated Value**	**Lab Value**	**Ratio/Percent Difference**	**Acceptable Limit**	**Meets QC Criteria?**
Cation/Anion Balance, % (CAB)	1.913	N/A	N/A	±5%	☒
Total Dissolved Solids, mg/L (TDS)	1032	898	1.15	0.8 – 1.2	☒
Specific Conductance, µS/cm (SpC)	1340	1050	1.28	0.8 – 1.2	☐

Comments: Holding time exceeded for pH; WWL qualified with "H" to indicate result value estimated. Manganese result above MDL and below RL; lab qualified with "J" to indicate result value estimated.

ATTACHMENT D

Summary of Analytical Results

WPX BWQ: GM 21-12 Baseline Analytical Summary								
Station Name			**Lindauer 47731**					
Facility ID			**703040**					
Sample Date			**5/13/2014 14:50**					
Field Sample ID			**ORONA 47731**					
Lab Sample ID			**D57717-1**					
	Reporting Units	**Analytic Method**	**Result**	**Lab Qual**	**WWL Qual**	**RL**	**MDL**	**DF**
Inorganics								
Alkalinity AS CaCO3, Total	mg/l	SM 2320B-2011	424			5	2	1
Alkalinity, Bicarbonate as CaCO3	mg/l	SM 2320B-2011	424			5	2	1
Alkalinity, Carbonate as CaCO3	mg/l	SM 2320B-2011	2	U		5	2	1
Bromide	mg/l	EPA 300.0/SW846 9056	0.11			0.1	0.05	2
Chloride	mg/l	EPA 300.0/SW846 9056	31.2			1	0.8	2
Fluoride	mg/l	EPA 300.0/SW846 9056	0.89			0.2	0.1	2
Nitrate as N	mg/l	EPA 300.0/SW846 9056	0.52			0.2	0.12	20
Nitrite as N	mg/l	EPA 300.0/SW846 9056	0.006	U		0.008	0.006	2
pH	s.u.	SM4500HB+-2011/9040C	7.31		H			1
Specific Conductivity	umhos/cm	SM 2510B-2011	1050			1		1
Sulfate	mg/l	EPA 300.0/SW846 9056	281			10	4	20
Total Dissolved Solids	mg/l	SM 2540C-2011	898			10	5	1
Total Phosphorous	mg/l	HACH8190/SM4500P-B/E	0.045			0.01	0.008	1
Dissolved Metals								
Barium	ug/l	EPA 200.7	32.6			10	1.4	1
Boron	ug/l	EPA 200.7	143			50	6.6	1
Calcium	ug/l	EPA 200.7	101000			400	66	1
Iron	ug/l	EPA 200.7	10.2			10	3.2	1
Magnesium	ug/l	EPA 200.7	64000			200	29	1
Manganese	ug/l	EPA 200.7	1	J		5	0.29	1
Potassium	ug/l	EPA 200.7	3090			1000	230	1
Selenium	ug/l	EPA 200.8	4.8			0.8	0.42	2
Sodium	ug/l	EPA 200.7	125000			400	36	1
Strontium	ug/l	EPA 200.7	1540			5	0.12	1
Organics								
Diesel Range Organics	mg/l	SW846-8015B	0.17	U		0.19	0.17	1
Gasoline Range Organics	ug/l	SW846 8260B	200	U		200		1
VOCs								
Benzene	ug/l	SW846 8260B	0.25	U		1	0.25	1
Ethylbenzene	ug/l	SW846 8260B	0.31	U		2	0.31	1
Toluene	ug/l	SW846 8260B	1	U		2	1	1
Xylenes (Total)	ug/l	SW846 8260B	1.5	U		3	1.5	1
Dissolved Gases								
Ethane	mg/l	RSK175 MOD	0.0008	U		0.0016	0.0008	1
Methane	mg/l	RSK175 MOD	0.0004	U		0.0008	0.0004	1
Propane	mg/l	RSK175 MOD	0.0011	U		0.0022	0.0011	1
Bacteria								
Iron Related Bacteria	cfu/ml	HACH IRB-BART	9000			25		1
Slime forming bacteria	cfu/ml	HACH SLYM-BART	12500			500		1
Sulfate Reducing Bacteria	cfu/ml	HACH SRB-BART	18000			200		1

WPX BWQ: GM 21-12 Baseline Analytical Summary								
Station Name			**Lindauer 47731**					
Facility ID			**703040**					
Sample Date			**5/13/2014 14:50**					
Field Sample ID			**ORONA 47731**					
Lab Sample ID			**D57717-1**					
	Reporting Units	**Analytic Method**	**Result**	**Lab Qual**	**WWL Qual**	**RL**	**MDL**	**DF**
Field_Parameters								
Bubbles	nu	Field	None					1
Color	nu	Field	Clear					1
Conductivity, Field	uS/cm	Field	982					1
Discharge, measured	gpm	Field	2.5		VAR			1
Dissolved Oxygen, Field	mg/l	Field	4.58					1
Dissolved Oxygen, Field,%	%	Field	40.7					1
Effervescence	nu	Field	None					1
Odor	nu	Field	None					1
ORP, field	mv	Field	122.4					1
pH, Field	s.u.	Field	7.06					1
Sediment	nu	Field	None					1
Specific Conductivity, Field	uS/cm	Field	1377					1
Temperature, Water	Deg C	Field	10.04					1
Turbidity, field	NTUs	Field	0.31		AV			1
VOA Headspace	nu	Field	None					1

Notes:

U = not detected at the reporting limit

H = hold time exceeded

J = result between RL and MDL, estimated

AV = result averaged

VAR = varies

ATTACHMENT E

Laboratory Analytical Summary Report

Mountain States ACCUTEST LABORATORIES

Reissue #1
07/15/14

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: GM 21-12 BWQ

Accutest Job Number: D57717

Sampling Date: 05/13/14

Report to:

Western Water and Land, Inc.

jpahler@westernwaterandland.com

ATTN: Jessie Pahler

Total number of pages in report: **49**

NELAP ACCREDITED TNI LABORATORY

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)

Accutest Laboratories
4036 Youngfield Street
Wheat Ridge, Co 80033
Phone: 303-425-6021
Fax: 303-425-6854

June 28, 2014

Bruce Smith
Western Water and Land, Inc.
743 Horizon Court Suite 330
Grand Junction, CO 80506

Subject: Report Reissue for Accutest Job: D57717

Dear Mr. Smith:

Per the request from your office, Accutest Laboratories has completed investigation into random instances of not being able to verify the MS/MSD calculations. The root cause has been identified as an inconsistent application of correct reporting flags in our LIMS system by the analyst. It is important to note, these reporting flags do not apply to the actual MS/MSD concentrations or spike recoveries in the report. Nor does it apply to the field sample data reported for your samples. It will only affect the parent sample data shown on the MS and MSD report in the metals QC section. Detailed information will be provided to your office via a completed Laboratory Corrective Action Report that will be issued upon it's completion. The report has been corrected to show the correct data in the metals QC section. The report has been reissued with these corrections. Please accept our apologies for these errors.

Any questions or concerns should be directed to the undersigned at 303-425-6021.

Sincerely,

Scott Heideman
Laboratory Director

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Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D57717

WWLCOGJ: GM 21-12 BWQ

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D57717-1	05/13/14	14:50	NWS	05/14/14	AQ	Ground Water	ORONA 47731
D57717-1F	05/13/14	14:50	NWS	05/14/14	AQ	Groundwater Filtered	ORONA 47731

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	WPX Energy Rocky Mountain, LLC	**Job No**	D57717
Site:	WWLCOGJ: GM 21-12 BWQ	**Report Date**	5/28/2014 11:19:28 AM

On 05/14/2014, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.9 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D57717 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:** V3V1788

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57463-1DUP, D57465-1MS were used as the QC samples indicated.

Volatiles by GC By Method RSK175 MOD

Matrix AQ **Batch ID:** GFB510

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57711-1MS, D57711-1MSD were used as the QC samples indicated.
- D57717-1,-1MS,-1MSD: The pH of the sample was >2 at time of analysis.

Extractables by GC By Method SW846-8015B

Matrix AQ **Batch ID:** OP9913

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57530-14MS, D57530-14MSD were used as the QC samples indicated.

Metals By Method EPA 200.7

Matrix AQ **Batch ID:** MP12918

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57688-1FMS, D57688-1FMSD were used as the QC samples for the metals analysis.

Metals By Method EPA 200.8

Matrix AQ **Batch ID:** MP12916

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57721-1FAMS, D57721-1FAMSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix AQ **Batch ID:** GP12567

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57680-1MS, D57680-1MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- D57717-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.

Wet Chemistry By Method HACH IRB-BART

Matrix AQ **Batch ID:** MB368

- 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:** MB369

- 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:** MB370

- 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:** GP12656

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57761-1DUP, D57761-1MS, D57761-1MSD were used as the QC samples for the Phosphorus, Total analysis.

Wet Chemistry By Method SM 2320B-2011

Matrix AQ **Batch ID:** GN24752

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57802-2DUP, D57802-2MS, D57802-2MSD were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

Matrix AQ **Batch ID:** GN24755

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

Matrix AQ **Batch ID:** GN24756

- 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:** GP12591

- Sample(s) D57817-1DUP were used as the QC samples for the Specific Conductivity analysis.

Wet Chemistry By Method SM 2540C-2011

Matrix AQ **Batch ID:** GN24762

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57783-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

Wet Chemistry By Method SM4500HB+-2011/9040C

Matrix AQ **Batch ID:** GN24705

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D57717-1

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: D57717
Account: WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ
Collected: 05/13/14

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
D57717-1	**ORONA 47731**					
Alkalinity, Bicarbonate as CaCO3		424	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		424	5.0	2.0	mg/l	SM 2320B-2011
Bromide		0.11	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Chloride		31.2	1.0	0.80	mg/l	EPA 300.0/SW846 9056
Fluoride		0.89	0.20	0.10	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria		9000	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate		0.52	0.20	0.12	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total		0.045	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria		12500	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved		898	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity		1050	1.0		umhos/cm	SM 2510B-2011
Sulfate		281	10	4.0	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria		18000	200		CFU/ml	HACH SRB-BART
pH		7.31			su	SM4500HB+-2011/9040C
D57717-1F	**ORONA 47731**					
Barium		32.6	10	1.4	ug/l	EPA 200.7
Boron		143	50	6.6	ug/l	EPA 200.7
Calcium		101000	400	66	ug/l	EPA 200.7
Iron		10.2	10	3.2	ug/l	EPA 200.7
Magnesium		64000	200	29	ug/l	EPA 200.7
Manganese		1.0 J	5.0	0.29	ug/l	EPA 200.7
Potassium		3090	1000	230	ug/l	EPA 200.7
Selenium		4.8	0.80	0.42	ug/l	EPA 200.8
Sodium		125000	400	36	ug/l	EPA 200.7
Strontium		1540	5.0	0.12	ug/l	EPA 200.7

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Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	ORONA 47731		
Lab Sample ID:	D57717-1	**Date Sampled:**	05/13/14
Matrix:	AQ - Ground Water	**Date Received:**	05/14/14
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	WWLCOGJ: GM 21-12 BWQ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V30556.D	1	05/14/14	BR	n/a	n/a	V3V1788
Run #2							

	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	103%		62-130%
2037-26-5	Toluene-D8	98%		70-130%
460-00-4	4-Bromofluorobenzene	91%		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

Report of Analysis

Client Sample ID:	ORONA 47731		
Lab Sample ID:	D57717-1	**Date Sampled:**	05/13/14
Matrix:	AQ - Ground Water	**Date Received:**	05/14/14
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	WWLCOGJ: GM 21-12 BWQ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB11143.D	1	05/15/14	JJ	n/a	n/a	GFB510
Run #2							

	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
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

Report of Analysis

Client Sample ID:	ORONA 47731		
Lab Sample ID:	D57717-1	**Date Sampled:**	05/13/14
Matrix:	AQ - Ground Water	**Date Received:**	05/14/14
Method:	SW846-8015B SW846 3510C	**Percent Solids:**	n/a
Project:	WWLCOGJ: GM 21-12 BWQ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD31408.D	1	05/19/14	JS	05/16/14	OP9913	GFD1509
Run #2							

	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	37%		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

Report of Analysis

Client Sample ID: ORONA 47731
Lab Sample ID: D57717-1
Matrix: AQ - Ground Water
Project: WWLCOGJ: GM 21-12 BWQ

Date Sampled: 05/13/14
Date Received: 05/14/14
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	424	5.0	2.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	424	5.0	2.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Bromide	0.11	0.10	0.050	mg/l	2	05/14/14 14:10	SK	EPA 300.0/SW846 9056
Chloride	31.2	1.0	0.80	mg/l	2	05/14/14 14:10	SK	EPA 300.0/SW846 9056
Fluoride	0.89	0.20	0.10	mg/l	2	05/14/14 14:10	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	1	05/19/14	MM	HACH IRB-BART
Nitrogen, Nitrate	0.52	0.20	0.12	mg/l	20	05/14/14 19:39	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite [a]	0.0060 U	0.0080	0.0060	mg/l	2	05/14/14 14:10	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.045	0.010	0.0080	mg/l	1	05/23/14	BF	HACH8190/SM4500P-B/E
Slime Forming Bacteria	12500	500		CFU/ml	1	05/19/14	MM	HACH SLYM-BART
Solids, Total Dissolved	898	10	5.0	mg/l	1	05/20/14	BF	SM 2540C-2011
Specific Conductivity	1050	1.0		umhos/cm	1	05/16/14	JD	SM 2510B-2011
Sulfate	281	10	4.0	mg/l	20	05/14/14 19:39	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	18000	200		CFU/ml	1	05/19/14	MM	HACH SRB-BART
pH	7.31			su	1	05/15/14 10:00	JB	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: ORONA 47731
Lab Sample ID: D57717-1F
Matrix: AQ - Groundwater Filtered
Project: WWLCOGJ: GM 21-12 BWQ

Date Sampled: 05/13/14
Date Received: 05/14/14
Percent Solids: n/a

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Barium	32.6	10	1.4	ug/l	1	05/15/14	05/17/14	KV	EPA 200.7 [1]	EPA 200.7 [5]
Boron	143	50	6.6	ug/l	1	05/15/14	05/17/14	KV	EPA 200.7 [1]	EPA 200.7 [5]
Calcium	101000	400	66	ug/l	1	05/15/14	05/20/14	KV	EPA 200.7 [3]	EPA 200.7 [5]
Iron	10.2	10	3.2	ug/l	1	05/15/14	05/17/14	KV	EPA 200.7 [1]	EPA 200.7 [5]
Magnesium	64000	200	29	ug/l	1	05/15/14	05/17/14	KV	EPA 200.7 [1]	EPA 200.7 [5]
Manganese	1.0 J	5.0	0.29	ug/l	1	05/15/14	05/17/14	KV	EPA 200.7 [1]	EPA 200.7 [5]
Potassium	3090	1000	230	ug/l	1	05/15/14	05/17/14	KV	EPA 200.7 [1]	EPA 200.7 [5]
Selenium	4.8	0.80	0.42	ug/l	2	05/15/14	05/20/14	NT	EPA 200.8 [2]	EPA 200.8 [4]
Sodium	125000	400	36	ug/l	1	05/15/14	05/20/14	KV	EPA 200.7 [3]	EPA 200.7 [5]
Strontium	1540	5.0	0.12	ug/l	1	05/15/14	05/17/14	KV	EPA 200.7 [1]	EPA 200.7 [5]

(1) Instrument QC Batch: MA4773
(2) Instrument QC Batch: MA4783
(3) Instrument QC Batch: MA4784
(4) Prep QC Batch: MP12916
(5) Prep QC Batch: MP12918

RL = Reporting Limit
MDL = Method Detection Limit

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

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Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

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ACCUTEST LABORATORIES

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

FED EX Tracking #: | Bottle Order Control #:
Accutest Quote #: JM5_2013_245 | Accutest Job #: D57717

Client / Reporting Information

Company Name: Western Water and Land, Inc.
Street Address: 743 Horizon Ct., Suite 330
City: Grand Junction, CO 81506
Project Contact: Bruce Smith bsmith@westernwaterandland.com
Phone #: (970) 242-0170
Sampler(s) Name(s): Nick Schwartz

Project Information

Project Name: GM 21-12 BWG
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)

Company Name: WPX Energy
Street Address: 1052 CR 215
City: Parachute, CO 81635
Attention: Brandon Danforth

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection: Date	Time	Sampled by	Matrix	# of bottles	Preserved: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	PH, SCON, TDS	XCARBICALK	BRO, CHL, F, NO2, NO30, SO4	TPO4	*Dissolved Metals - Lab Filtered	VRSK175DGMEP	V8260BTXGRO	B8015DRO	BART	**Isotopic Methane	LAB USE ONLY
	Orona 47731		5/13/14	1450	NWS	GW	15	3	0	0	1	11	0	0	0	1	1	1	1	1	3	3	2	1	1	01
	TBT, TBZ SLK																					* SLK				5-14-14
																										5-14-14
	Orona 47731		Field Parameters: pH(s.u.): 7.06	Temp(°C): 10.04	Sp.Cond(uS/cm): 1377	DO(%): 40.7	DO(mg/L) 4.58	ORP(mv): 122.4	TURB(NTU): 0.31 (averaged)																	
			Field Parameters: pH(s.u.):	Temp(°C):	Sp.Cond(uS/cm):	DO(%):	DO(mg/L)	ORP(mv):	TURB(NTU):																	

Turnaround Time (Business days)

- [x] Std. 15 Business Days
- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day Emergency
- [ ] 2 Day Emergency
- [ ] 1 Day Emergency
- [ ]

Approved By (Accutest PM): / Date:

Emergency & Rush T/A data available VIA Lablink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] COMMBN
- [ ] COMMBN+
- [ ]
- [ ] State Forms Required
- [ ] Send Forms to State
- [ ] Report by Fax
- [ ] Report by PDF
- [x] EDD Format

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial BN = Results/QC/Narrative (+ = chromatograms)

Comments / Special Instructions

*Dissolved Metals (200.7/200.8): Ba, B, Ca, Fe,Mg, Mn, K, SeMS, Na, Sr

**Hold pending RSK175 results

No trip blanks in cooler.

Relinquished by Sampler:	Received By:	Relinquished By:	Date Time:	Received By:
1 5/13/14@ 1530	1 Fed Ex Service Center	2		2 Jacob Porter 5/14/14 1357
Relinquished by Sampler:	Received By:	Relinquished By:	Date Time:	Received By:
3	3	4		4
Relinquished by:	Received By:	Custody Seal # +10/10	Intact / Not Intact	Preserved where applicable: T	On Ice	Cooler Temp. 3.9
5	5			

D57717: Chain of Custody
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Mountain States ACCUTEST LABORATORIES

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: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1788-MB	3V30542.D	1	05/14/14	BR	n/a	n/a	V3V1788

The QC reported here applies to the following samples: **Method:** SW846 8260B

D57717-1

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	106%	62-130%
2037-26-5	Toluene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	92%	69-130%

Blank Spike Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1788-BS	3V30543.D	1	05/14/14	BR	n/a	n/a	V3V1788

The QC reported here applies to the following samples: **Method:** SW846 8260B

D57717-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	55.2	110	70-130
100-41-4	Ethylbenzene	50	57.0	114	70-130
108-88-3	Toluene	50	53.6	107	70-130
1330-20-7	Xylene (total)	150	154	103	70-130

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

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V1788-BS	3V30544.D	1	05/14/14	BR	n/a	n/a	V3V1788

The QC reported here applies to the following samples: **Method:** SW846 8260B

D57717-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1990	90	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	94%	62-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	98%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D57465-1MS	3V30548.D	5	05/14/14	BR	n/a	n/a	V3V1788
D57465-1	3V30547.D	5	05/14/14	BR	n/a	n/a	V3V1788

The QC reported here applies to the following samples: **Method:** SW846 8260B

D57717-1

CAS No.	Compound	D57465-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
71-43-2	Benzene	40.8		250	313	109	62-130
100-41-4	Ethylbenzene	25.7		250	311	114	63-130
108-88-3	Toluene	35.1		250	301	106	60-130
1330-20-7	Xylene (total)	58.7		750	824	102	67-130

CAS No.	Surrogate Recoveries	MS	D57465-1	Limits
17060-07-0	1,2-Dichloroethane-D4	95%	102%	62-130%
2037-26-5	Toluene-D8	100%	98%	70-130%
460-00-4	4-Bromofluorobenzene	100%	95%	69-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D57465-1MS	3V30549.D	5	05/14/14	BR	n/a	n/a	V3V1788
D57465-1	3V30547.D	5	05/14/14	BR	n/a	n/a	V3V1788

The QC reported here applies to the following samples: **Method:** SW846 8260B

D57717-1

CAS No.	Compound	D57465-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	ND		11000	10900	99	19-168

CAS No.	Surrogate Recoveries	MS	D57465-1	Limits
17060-07-0	1,2-Dichloroethane-D4	97%	102%	62-130%
2037-26-5	Toluene-D8	100%	98%	70-130%
460-00-4	4-Bromofluorobenzene	98%	95%	69-130%

* = Outside of Control Limits.

Duplicate Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D57463-1DUP	3V30546.D	20	05/14/14	BR	n/a	n/a	V3V1788
D57463-1	3V30545.D	20	05/14/14	BR	n/a	n/a	V3V1788

The QC reported here applies to the following samples: **Method:** SW846 8260B

D57717-1

CAS No.	Compound	D57463-1 ug/l	Q	DUP ug/l	Q	RPD	Limits
71-43-2	Benzene	39.6		38.7		2	30
100-41-4	Ethylbenzene	15.4	J	13.9	J	10	30
108-88-3	Toluene	43.1		40.3		7	30
1330-20-7	Xylene (total)	58.6	J	55.0	J	6	30
	TPH-GRO (C6-C10)	ND		ND		nc	30

CAS No.	Surrogate Recoveries	DUP	D57463-1	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	100%	62-130%
2037-26-5	Toluene-D8	99%	99%	70-130%
460-00-4	4-Bromofluorobenzene	95%	94%	69-130%

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

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: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB510-MB	FB11137.D	1	05/15/14	JJ	n/a	n/a	GFB510

The QC reported here applies to the following samples: **Method:** RSK175 MOD

D57717-1

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	

Blank Spike Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB510-BS	FB11138.D	10	05/15/14	JJ	n/a	n/a	GFB510

The QC reported here applies to the following samples: **Method:** RSK175 MOD

D57717-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.617	121	70-130
74-84-0	Ethane	0.956	1.08	113	70-130
74-98-6	Propane	1.4	1.61	115	67-130

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D57711-1MS [a]	FB11140.D	10	05/15/14	JJ	n/a	n/a	GFB510
D57711-1MSD [a]	FB11141.D	10	05/15/14	JJ	n/a	n/a	GFB510
D57711-1 [a]	FB11139.D	1	05/15/14	JJ	n/a	n/a	GFB510

The QC reported here applies to the following samples: **Method:** RSK175 MOD

D57717-1

CAS No.	Compound	D57711-1 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	ND		0.51	0.578	113	0.51	0.581	114	1	51-155/30
74-84-0	Ethane	ND		0.956	1.01	106	0.956	1.01	106	0	58-130/30
74-98-6	Propane	ND		1.4	1.49	106	1.4	1.50	107	1	46-130/30

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

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

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: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9913-MB	FD31462.D	1	05/20/14	JS	05/16/14	OP9913	GFD1511

The QC reported here applies to the following samples: **Method:** SW846-8015B

D57717-1

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	52%	10-130%

Blank Spike Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9913-BS	FD31464.D	1	05/20/14	JS	05/16/14	OP9913	GFD1511

The QC reported here applies to the following samples: **Method:** SW846-8015B

D57717-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.64	53	33-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	45%	10-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D57717
Account: WILLCOP WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9913-MS	FD31463.D	1	05/20/14	JS	05/16/14	OP9913	GFD1512
OP9913-MSD	FD31465.D	1	05/20/14	JS	05/16/14	OP9913	GFD1512
D57530-14	FD31467.D	1	05/20/14	JS	05/16/14	OP9913	GFD1512

The QC reported here applies to the following samples: **Method:** SW846-8015B

D57717-1

CAS No.	Compound	D57530-14 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND		5	2.10	42	5	2.37	47	12	33-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D57530-14	Limits
84-15-1	o-Terphenyl	69%	73%	40%	10-130%

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

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: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12916
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 05/15/14

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	0.077	<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 MP12916: D57717-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12916
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 05/15/14

Metal	D57721-1FA Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony	anr				
Arsenic	anr				
Barium					
Beryllium	anr				
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Magnesium					
Manganese					
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium					
Selenium	5.9	194	200	94.0	70-130
Silver	anr				
Sodium					
Strontium					
Thallium	anr				
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP12916: D57717-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12916 Methods: EPA 200.8
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/15/14

Metal	D57721-1FA Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	anr					
Arsenic	anr					
Barium						
Beryllium	anr					
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Magnesium						
Manganese						
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium						
Selenium	5.9	199	200	96.6	2.5	20
Silver	anr					
Sodium						
Strontium						
Thallium	anr					
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP12916: D57717-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12916
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 05/15/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony	anr			
Arsenic	anr			
Barium				
Beryllium	anr			
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium				
Selenium	206	200	103.0	85-115
Silver	anr			
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP12916: D57717-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/15/14

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	-0.10	<10
Beryllium	10	.8	1.7		
Boron	50	.8	6.6	-2.2	<50
Cadmium	10	.2	.36		
Calcium	400	2.2	66	13.0	<400
Chromium	10	.3	1.4		
Cobalt	5.0	.4	.51		
Copper	10	.8	1.5		
Iron	10	1.5	3.2	2.8	<10
Lead	50	2.1	4.1		
Lithium	5.0	.4	1.9		
Magnesium	200	6.8	29	-1.4	<200
Manganese	5.0	.01	.29	0.60	<5.0
Molybdenum	10	.4	1.1		
Nickel	30	.5	.87		
Phosphorus	100	15	24		
Potassium	1000	99	230	27.1	<1000
Selenium	50	7.1	9.3		
Silicon	50	4.7	5.6		
Silver	30	.3	.4		
Sodium	400	4.9	36	77.9	<400
Strontium	5.0	.01	.12	0.10	<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 MP12918: D57717-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/15/14

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/15/14

Metal	D57688-1F Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	20.6	2100	2000	104.0	70-130
Beryllium					
Boron	256	1350	1000	109.4	70-130
Cadmium	anr				
Calcium	31200	56000	25000	99.2	70-130
Chromium	anr				
Cobalt					
Copper	anr				
Iron	36.1	4930	5000	97.9	70-130
Lead	anr				
Lithium					
Magnesium	13000	37800	25000	99.2	70-130
Manganese	83.4	612	500	105.7	70-130
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium	16200	43000	25000	107.2	70-130
Selenium	anr				
Silicon					
Silver	anr				
Sodium	54800	81900	25000	108.4	70-130
Strontium	221	735	500	102.8	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP12918: D57717-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/15/14

Metal	D57688-1F Original MS	Spikelot ICPALL2	% Rec	QC Limits

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/15/14

Metal	D57688-1F Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	20.6	2100	2000	104.0	0.0	20
Beryllium						
Boron	256	1330	1000	107.4	1.5	20
Cadmium	anr					
Calcium	31200	56400	25000	100.8	0.7	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	36.1	4960	5000	98.5	0.6	20
Lead	anr					
Lithium						
Magnesium	13000	38100	25000	100.4	0.8	20
Manganese	83.4	603	500	103.9	1.5	20
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	16200	43100	25000	107.6	0.2	20
Selenium	anr					
Silicon						
Silver	anr					
Sodium	54800	81800	25000	108.0	0.1	20
Strontium	221	738	500	103.4	0.4	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP12918: D57717-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/15/14

Metal	D57688-1F 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: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/15/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	2080	2000	104.0	85-115
Beryllium				
Boron	1040	1000	104.0	85-115
Cadmium	anr			
Calcium	26700	25000	106.8	85-115
Chromium	anr			
Cobalt				
Copper	anr			
Iron	4950	5000	99.0	85-115
Lead	anr			
Lithium				
Magnesium	25300	25000	101.2	85-115
Manganese	524	500	104.8	85-115
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	27000	25000	108.0	85-115
Selenium	anr			
Silicon				
Silver	anr			
Sodium	28200	25000	112.8	85-115
Strontium	522	500	104.4	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP12918: D57717-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

QC Batch ID: MP12918
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/15/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits

(anr) Analyte not requested

Mountain States ACCUTEST LABORATORIES

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: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN24755	5.0	2.2	mg/l	100	99.1	99.1	90-110%
Alkalinity, Carbonate	GN24756	5.0	2.2	mg/l	100	99.1	99.1	80-120%
Alkalinity, Total as CaCO3	GN24752	5.0	2.2	mg/l	100	99.1	99.1	90-110%
Bromide	GP12567/GN24696	0.050	0.0	mg/l	0.5	0.516	103.2	90-110%
Chloride	GP12567/GN24696	0.50	0.0	mg/l	5	4.66	93.2	90-110%
Fluoride	GP12567/GN24696	0.10	0.0	mg/l	1	0.991	99.1	90-110%
Iron Reducing Bacteria	MB368	25	<25	CFU/ml				
Nitrogen, Nitrate	GP12567/GN24696	0.010	0.0	mg/l	0.1	0.101	101.0	90-110%
Nitrogen, Nitrite	GP12567/GN24696	0.0040	0.0	mg/l	0.05	0.0527	105.4	90-110%
Phosphorus, Total	GP12656/GN24822	0.010	0.0	mg/l	0.38	0.40	104.1	80-120%
Slime Forming Bacteria	MB369	500	<500	CFU/ml				
Solids, Total Dissolved	GN24762	10	0.0	mg/l	400	394	98.5	90-110%
Specific Conductivity	GP12591/GN24722			umhos/cm	99.5	97.7	98.2	90-110%
Sulfate	GP12567/GN24696	0.50	0.0	mg/l	5	4.90	98.0	90-110%
Sulfate Reducing Bacteria	MB370	200	<200	CFU/ml				
pH	GN24705			su	8.00	8.01	100.1	99.3-100.7%

Associated Samples:
Batch MB368: D57717-1
Batch MB369: D57717-1
Batch MB370: D57717-1
Batch GN24705: D57717-1
Batch GN24752: D57717-1
Batch GN24755: D57717-1
Batch GN24756: D57717-1
Batch GN24762: D57717-1
Batch GP12567: D57717-1
Batch GP12591: D57717-1
Batch GP12656: D57717-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN24752	D57802-2	mg/l	120	118	1.9	0-20%
Phosphorus, Total	GP12656/GN24822	D57761-1	mg/l	0.034	0.037	8.4	0-20%
Solids, Total Dissolved	GN24762	D57783-1	mg/l	52.0	56.0	7.4	0-20%
Specific Conductivity	GP12591/GN24722	D57817-1	umhos/cm	1320	1330	0.5	0-20%

Associated Samples:
Batch GN24752: D57717-1
Batch GN24762: D57717-1
Batch GP12591: D57717-1
Batch GP12656: D57717-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN24752	D57802-2	mg/l	120	100	215	94.8	80-120%
Bromide	GP12567/GN24696	D57680-1	mg/l	0.0	25	26.3	105.2	80-120%
Chloride	GP12567/GN24696	D57680-1	mg/l	105	250	356	100.4	80-120%
Fluoride	GP12567/GN24696	D57680-1	mg/l	0.0	50	54.0	108.0	80-120%
Nitrogen, Nitrate	GP12567/GN24696	D57680-1	mg/l	15.9	5	21.1	104.0	80-120%
Nitrogen, Nitrite	GP12567/GN24696	D57680-1	mg/l	0.0	2.5	2.6	104.0	80-120%
Phosphorus, Total	GP12656/GN24822	D57761-1	mg/l	0.034	0.40	0.47	109.0	80-120%
Sulfate	GP12567/GN24696	D57680-1	mg/l	184	250	445	104.4	80-120%

Associated Samples:
Batch GN24752: D57717-1
Batch GP12567: D57717-1
Batch GP12656: D57717-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D57717
Account: WILLCOP - WPX Energy Rocky Mountain, LLC
Project: WWLCOGJ: GM 21-12 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN24752	D57802-2	mg/l	120	100	217	-0.6	20%
Bromide	GP12567/GN24696	D57680-1	mg/l	0.0	25	26.5	0.8	20%
Chloride	GP12567/GN24696	D57680-1	mg/l	105	250	351	1.4	20%
Fluoride	GP12567/GN24696	D57680-1	mg/l	0.0	50	52.5	2.8	20%
Nitrogen, Nitrate	GP12567/GN24696	D57680-1	mg/l	15.9	5	20.8	1.4	20%
Nitrogen, Nitrite	GP12567/GN24696	D57680-1	mg/l	0.0	2.5	2.6	0.0	20%
Phosphorus, Total	GP12656/GN24822	D57761-1	mg/l	0.034	0.40	0.450	4.3	20%
Sulfate	GP12567/GN24696	D57680-1	mg/l	184	250	436	2.0	20%

Associated Samples:
Batch GN24752: D57717-1
Batch GP12567: D57717-1
Batch GP12656: D57717-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits