



Western Water & Land, Inc.

June 19, 2014

Mr. Brandon Danforth  
Environmental Specialist  
WPX Energy  
1058 County Road 215  
Parachute, Colorado 81635

**RE: RU 11-7 Completions Pit First Subsequent Results Report, March 2014 Event**

Dear Mr. Danforth,

Western Water & Land, Inc. (WWL) has completed the first subsequent water quality sampling for the WPX Energy Rocky Mountain LLC (WPX) RU 11-7 Completions Pit in accordance with the Colorado Oil and Gas Conservation Commission (COGCC) Condition of Approval 9 (COA 9). The RU 11-7 Completions Pit is located in NW $\frac{1}{4}$ , NW  $\frac{1}{4}$ , Section 7, Township 7 South, Range 93 West, 6<sup>th</sup> PM. The initial baseline sampling event was conducted in June, 2013 (see RU 11-7 Completions Pit Baseline Results Report, June 2013 Event).

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

**FIELD SAMPLING LOCATIONS AND ACTIVITIES**

As described in the Water Source Evaluation for Completions Pit RU 11-7 (May 1, 2013), three sampling locations were identified for field sampling of water quality consistent with requirements of COA 9. One spring, one water well, and a stream were identified as preferred sampling locations:

- Yellow Jacket Spring
- Savage Beaver Creek Well 2
- Beaver Creek

WWL personnel conducted broad field reconnaissance to locate “Savage Beaver Creek Well 2”, but did not locate the well. State records indicate that the well was dry when drilled and it may not have been completed. No substitute preferred groundwater sources were identified in the evaluation, so Beaver Creek surface water was sampled.

Three samples for the first subsequent sampling event were collected for the RU 11-7 Completions Pit. Sample Yellow Jacket Spg was collected from Yellow Jacket Spring, sample Spg RU 11-7 was also collected from Yellow Jacket Spring as a blind field duplicate, and sample Beaver Cr 2 was collected from Beaver Creek.

At Yellow Jacket Spring, groundwater was conveyed an unknown distance downhill through two one and one-half inch polyethylene pipes. One pipe was plumbed into stock watering tanks and the other was stubbed out of the ground and drained into a small watering trough; the spring water sample was collected directly from the stubbed out pipe. Beaver Creek was sampled at a new sampling location adjacent to County Road 317 approximately 1,660 feet downstream from the initial baseline station, and approximately 5,340 feet downgradient of the RU 11-7 Completions Pit. The sampling location was moved downstream in order to incorporate a tributary that drains the catchment that the RU 11-7 Completions Pit is located in. The sampling event was conducted on March 5, 2014.

Sampled locations were field-staked using a 4-foot long, green metal stake identified with a metal tag with the sample ID. See Figure 1 for the sampled and previously sampled locations. Photographs of the sampling sites are shown in Attachment A.

All sampling procedures followed the WPX SAP (Sampling and Analysis Plan) and the COGCC Model SAP protocols. Yellow Jacket Spg and Spg RU 11-7 were collected according to Sampling Method 2 for springs and seeps and Beaver Cr 2 was collected according to Sampling Method 1 for spring and seeps, described in Version 1 of the COGCC Model SAP.

Samples were relinquished to the analytical laboratory's (Accutest<sup>®</sup>, Wheat Ridge, Colorado) courier who carefully packs them in plastic ice chests (coolers) with ice for preservation and ships them to the analytical laboratory by way of overnight courier (FedEx Ground<sup>®</sup>).

## **QUALITY CONTROL**

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 WPX SAP and COGCC Model SAP. All samples were collected by direct filling methods; dissolved gas sampling for samples Yellow Jacket Spg and Spg RU 11-7 were conducted using Method 2 for springs and seeps; dissolved gas sampling for sample Beaver Cr 2 was conducted using Method 1 for springs and seeps. Sampling at Yellow Jacket Spg and Spg RU 11-7 (spring site) was conducted at an end-of-pipe location (sampling tubing could not readily be connected to the pipe opening). Dissolved gas bottles were filled directly from the end-of-pipe discharge to reduce potential further degassing caused by turbulence in an open collection container. No field procedure deviations occurred that were cause for data qualification.

### **COC**

The chain-of-custody form was reviewed for correct and complete sample IDs, requested analysis, and other pertinent information. The analytes requested on the COC matched the requirements of Rule 609. DRO (diesel range organics) and GRO (gasoline range organics) were designated on the COC 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 ( $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ). 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**

All analyses were conducted within recommended holding times, with the exception of lab pH; WWL designated an "H" qualifier to indicate the results are estimated.

### **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.

Selenium had a dilution factor of 2. All other analytes had a dilution factor of 1. AMS reports sample results at the reporting limit (RL) as "undetected" or "U" rather than reporting results as less than the reporting or detection limit, e.g.  $< 0.05\text{ug/L}$ .

### **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  $\pm 5\%$ , 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:

- Yellow Jacket Spg: 1.615%
- Spg RU 11-7: 5.430%
- Beaver Cr 2: 1.767%

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:

- Yellow Jacket Spg: 1.22
- Spg RU 11-7: 1.23
- Beaver Cr 2: 1.16

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  $\pm$  RL.

One field duplicate (sample Spg RU 11-7) was collected for Yellow Jacket Spring (sample Yellow Jacket Spg). Slime forming bacteria and field oxidation-reduction potential (ORP) exceeded the RPD limit of 35 percent; slime forming bacteria showed an RPD of 63.2 percent, field ORP showed and RPD of 50.3 percent. Based on the analytical methods used and expected sample heterogeneity that would affect these constituents, field duplicate RPDs may be high. Nonetheless, slime forming bacteria and ORP were qualified in the analytical results.

### **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 were no detections of volatiles (benzene, toluene, ethylbenzene, and xylenes; BTEX) in the analyzed trip blank samples. No data were qualified based on trip blank analytical results.

### **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. 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 select Yellow Jacket Spg, Spg RU 11-7, or Beaver Cr 2 matrix for testing matrix quality control samples. AMS selected a number of other samples for testing MS and MSD based on the analytical method being used. The MS and MSD recoveries met guidance criteria for precision and accuracy for all analytes with the exception of calcium, magnesium, sodium, and strontium associated with sample Beaver Cr 2 and TPH-DRO associated with all samples. The MS recovery for TPH- DRO was low by 1%. The lab reported that the probable cause for the low recovery was possible matrix interference. The MS and MSD recoveries exceeding guidance criteria associated with sample Beaver Cr 2 are as follows:

<b>Surrogate</b>	<b>QC Sample</b>	<b>Direction</b>
Calcium	<b>MS and MSD</b>	<b>Low 142 %, Low 66 %</b>
Magnesium	<b>MS and MSD</b>	<b>High 94 %, High 122%</b>
Sodium	<b>MS and MSD</b>	<b>Low 146 %, Low 118 %</b>
Strontium	<b>MS and MSD</b>	<b>High 50 %, High 70 %</b>

The lab reported that the probable cause for the low recovery of calcium, magnesium, sodium, and strontium was the spike amount being low relative to the sample amount. 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.

Sample Beaver Cr 2 exceeded the control limits for duplicate RPD for total phosphorus; the RPD recovery for total phosphorus was high by 10.6%. AMS did not select a sample from this field investigation for RPD calculations. The lab reports the RPD acceptable due to low duplicate and sample concentrations; no qualifiers were assigned by the laboratory because of RPD values exceeding

the laboratory acceptance criteria. No qualifiers were assigned by WWL because the sample concentration used for the RPD calculation was low (< 10X MDL).

Data Quality Review Sheets are presented in Attachment C.

### **QC Summary**

AMS Laboratories assigned analytical results that were undetected with a “U” qualifier, and assigned results that were detected below the reporting limit but above the method detection limit with a “B” qualifier 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. The analytical results are summarized in Attachment D; the data are qualified as indicated. The full laboratory analytical report is presented in Attachment E.

No analyzed hydrocarbons (diesel range organics, gasoline range organics, benzene, toluene, ethylbenzene, and xylenes) were detected in the sampled water sources for the March 2014 sampling event. Dissolved methane was detected below 1 mg/L at the Yellow Jacket Spg site which is consistent with past baseline results (June 27, 2013).

Sample Beaver CR 2 shows constituent concentrations notably different (mostly greater) than the baseline sample RU 11-7-Beaver Creek. This is likely related to the different sampling locations. As mentioned, the sample location was changed to best accommodate potential surface or subsurface discharge from the RU 11-7 pit to surrounding drainages. Sample Beaver CR 2 was located to accommodate potential discharge from a tributary drainage.

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

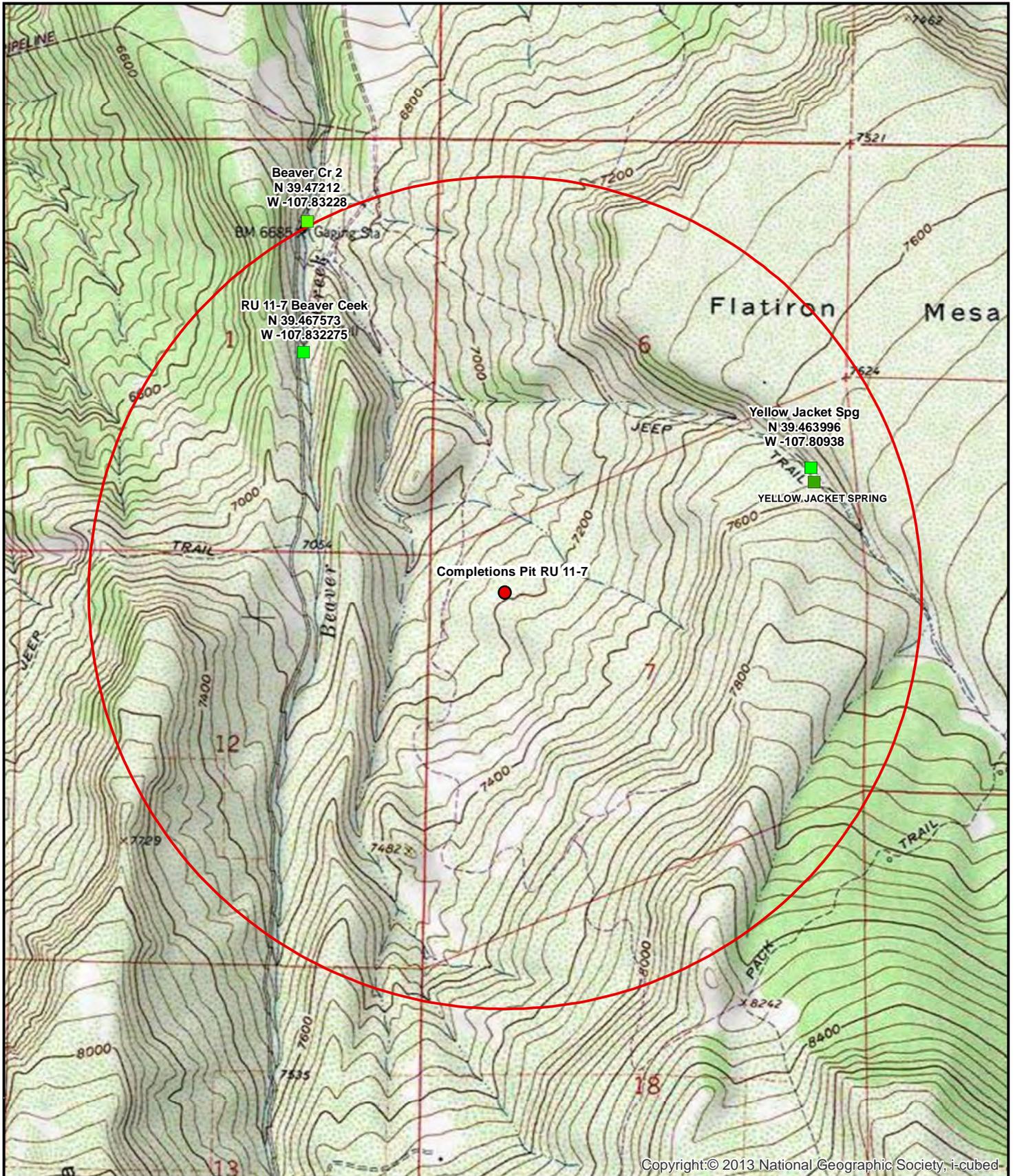
Attachment A - Photographs

Attachment B - Field Monitoring Forms

Attachment C - Data Quality Review Sheets

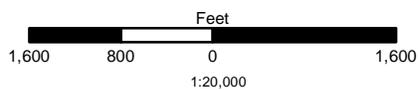
Attachment D - Summary of Analytical Results

Attachment E - Laboratory Analytical Summary Report



**Legend**

- Sample Location(s)
- Completions Pit RU 11-7
- Decree
- 1-Mile Radius Evaluation Area
- Constructed well



**Figure 1: RU 11-7 Completions Pit Sampling Locations  
COGCC COA 9 First Subsequent Sampling  
NW1/4, NW1/4, S7, T7S, R93W, 6PM**

WPX Energy Rocky Mtn. LLC  
Garfield County, Colorado



Western Water & Land, Inc.  
Applications in Earth Science

Basemap Source: Bing Maps and Esri ArcGIS Online

**ATTACHMENT A**

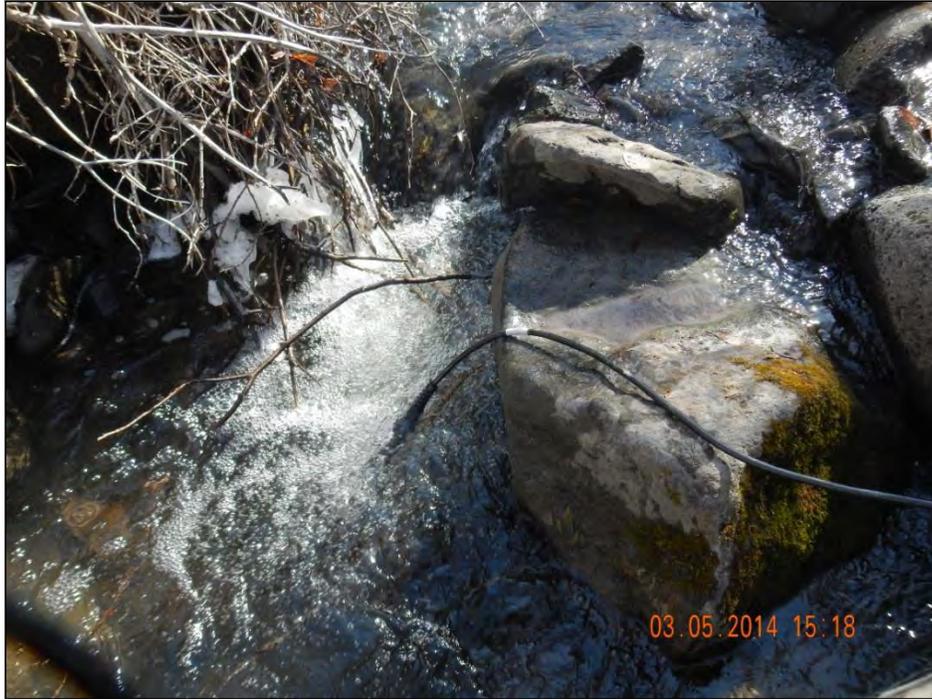
**Photographs**



**Photo 1. Yellow Jacket Spring Sampling Location (Yellow Jacket Spg and Spg RU 11-7)**



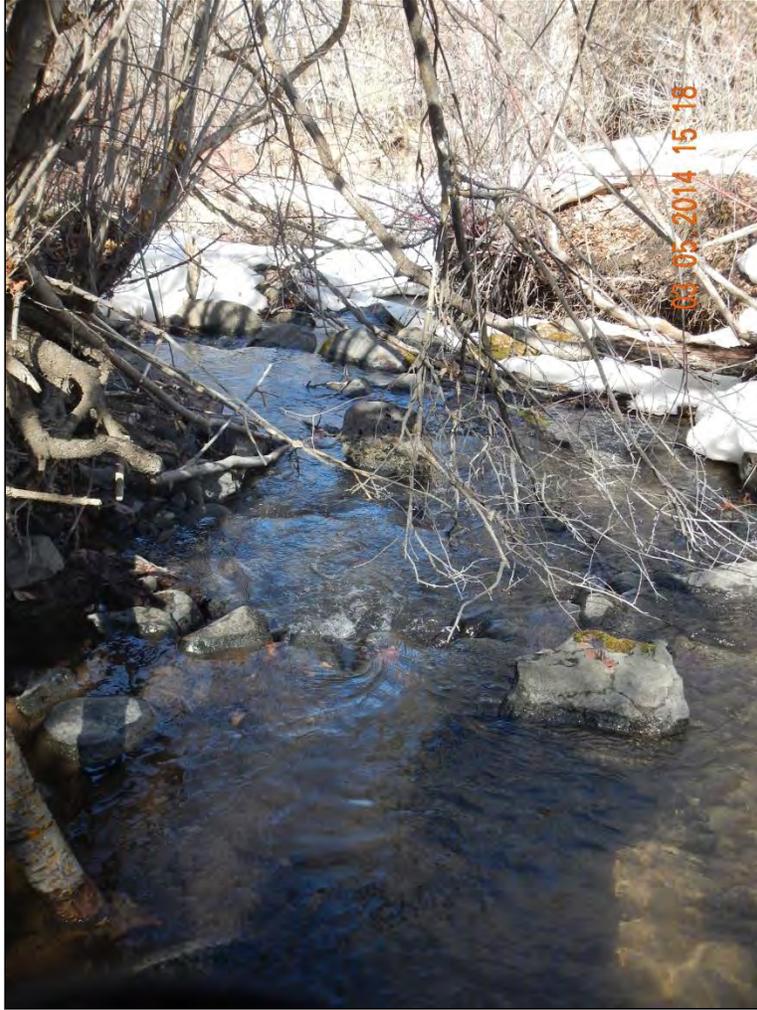
**Photo 2. Yellow Jacket Spring Sampling Location (Yellow Jacket Spg and Spg RU 11-7); Stock Watering Tanks**



**Photo 3. Beaver Creek Sampling Location (Beaver Cr 2)**



**Photo 4. Beaver Creek Sampling Location (Beaver Cr 2); View Upstream**



**Photo 5. Beaver Creek Sampling Location (Beaver Cr 2); View Downstream**

**ATTACHMENT B**

**Field Monitoring Forms**

## WPX BWQ Surface Water Monitoring Field Form

Project Information			
Project:	WPX BWQ	Sample Purpose:	<del>609</del> subsequent 1 COA 9
Site Name (Well Pad):	RU 11-7	Site API:	045-06818
Station Name:	Federal 5595	Sample Date:	3-5-14
COGCC Facility ID:	752709	Start Time:	1040
Field Sample ID:	Yellow Jacket Spg	End Time:	1130
Landowner Name:	BLM CO River Valley field office	Sample Time:	1045
Landowner Address:	2300 River Frontage Rd, SH, CO	Sample Team:	SLK, NWS
Water Right/Well Owner:	BLM	Observer:	SLK
Water Right/Well Permit:	Yellow Jacket Spring	Lead Signature/Date:	<i>[Signature]</i> 3-6-14

Station Information			
Station Description:	2" Poly pipe that flows into stock tank		
Approximate Distance to Well Pad:	4,200 FT		
Station Type:	Stream / <u>Spring</u> / Seep / Pond / Lake / NPDES Outfall / Other:		
Sampling Location:	Bank / <u>Pipe</u> / Wading / Boat / Bridge / Hose bib / Tank / Other:		
Sampling Location Description:	Pool / Riffle / Eddy / Backwater / Open / Channel / Braided / Other: end of pipe		
Sampling Location Width:	N/A	Sampling Location Depth:	N/A
GPS Location:	Zone	x	y z
		-107.80938	39.463996 7540 FT

Weather Conditions			
Sky:	<u>Clear</u> / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	40
Precipitation:	<u>None</u> / Light / Moderate / Heavy	Precip Type:	<u>None</u> / Rain / Sleet / Hail / Snow
Wind:	<u>Calm</u> / Light / Mod / Strong	Wind Speed/Direction:	Q

Field Measurements							
Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	3.05	1110		YSI 550	container	
pH	s.u.	7.02					
Sp. Conductivity	uS/cm	622					
Conductivity	uS/cm	361					
DO Saturation	%	46.8					
DO	mg/L	6.22					
Baro Press	mmHg	579.3					
ORP	RmV	70.4					
Turbidity	NTU	0.85	1115	AV	Micropi		0.96, 0.86, 0.74
Discharge	gpm	0.139	1050		250mL bottle		
H2S	mg/L	0	1130	AV	H2S-C kit		
<u>Colorimeter</u>	<u>mg/L</u>	0	1137	AV	<u>Colorimeter</u>		
Color:	<u>Clear</u> / White / Yellow / Brown / Green / Blue / Other			Light / Med / Dark			
Odor:	<u>None</u> / Mild / Mod / Strong						
Effervescence:	<u>None</u> / Mild / Mod / Strong			Bubbles: <u>None</u> / Low / Mod / High			
Sediment:	<u>None</u> / Light / Mod / Heavy			VOA Headspace: <u>None</u> / ≤ Pea Size / ≥ Pea Size			
Lab Analysis:	<u>Rule 609</u> / COA 9 / COA 22 / Other						
Field Filtered:	<u>Yes</u> / No		Filter Size:	N/A		No. Filters used:	N/A

Flag Codes: NM (not measured), J (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)

# WPX BWQ Surface Water Monitoring Field Form

Landowner Comments on water quality:

NA

Additional information:

Spring is piped into the ground an unknown distance.  
Discharge is very low.

Discharge:  $250 \text{ ml} / 28.5 \text{ sec} = 527.5 \text{ mL/min} = 0.139 \text{ gal/min}$

HS-C test, run 1: 0.0 mg/L @ 1120  
run 2: 0.0 mg/L @ 1130

Colorimeter test: 0 mg/L @ 1128  
0 mg/L @ 1137

Duplicate sample taken 'Spg 2U 11-7' see field sheet  
Actual sample time: 1136. Time on LOC: 1245

Calibration Information			Date: 3-5-14			Location: WWL office			
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments	
YSI 556 ↓	pH	s.u.	0830	7.0	22.66	7.07	7.00		
	pH	s.u.	0832	10.01	22.54	10.00	10.01		
	pH	s.u.	0835	4.01	22.59	3.98	4.00		
	SpC	uS/cm	0826	8974	22.61	<del>8974</del> 8997	8974		
	SpC	uS/cm							
	DO	%	0841			22.07	84.7		644.9 mmHg
	DO	%							
	ORP	RmV							
micro TPI	Turbidity	NTU	0840		<del>0840</del>				

## WPX BWQ Surface Water Monitoring Field Form

Project Information			
Project:	WPX BWQ	Sample Purpose:	Duplicate
Site Name (Well Pad):	2U 11-7	Site API:	045-04818
Station Name:	Federal 5595	Sample Date:	3-5-14
COGCC Facility ID:	752709	Start Time:	1130
Field Sample ID:	SPQ 2U 11-7	End Time:	1230
Landowner Name:	BLM CO River Valley Field Office	Sample Time:	1136
Landowner Address:	2300 River Frontage Rd, Silt	Sample Team:	SLK, NWS
Water Right/Well Owner:	BLM	Observer:	NWS
Water Right/Well Permit:	Yellow Jacket Spring	Lead Signature/Date:	<i>[Signature]</i> 3-6-14

Station Information			
Station Description:	2" Poly pipe that flows into stock tank		
Approximate Distance to Well Pad:	14,200 ft		
Station Type:	Stream / Spring / Seep / Pond / Lake / NPDES Outfall / Other:		
Sampling Location:	Bank / Pipe / Wading / Boat / Bridge / Hose bib / Tank / Other:		
Sampling Location Description:	Pool / Riffle / Eddy / Backwater / Open / Channel / Braided / Other: end of pipe		
Sampling Location Width:	N/A	Sampling Location Depth:	N/A
GPS Location:	Zone	x: 107.80938	y: 39.463996 z: 7540 ft

Weather Conditions			
Sky:	Clear / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	45
Precipitation:	None / Light / Moderate / Heavy	Precip Type:	None / Rain / Sleet / Hail / Snow
Wind:	Calm / Light / Mod / Strong	Wind Speed/Direction:	Q

Field Measurements							
Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	2.22	1205		YSI 550	Container	
pH	s.u.	7.12					
Sp. Conductivity	uS/cm	627					
Conductivity	uS/cm	356					
DO Saturation	%	38.6					
DO	mg/L	5.20					
Baro Press	mmHg	578.5					
ORP	RmV	42.1					
Turbidity	NTU	0.98	1215	AV	micro TPI		0.91, 0.90, 1.14
Discharge	mL/min	600	1205		Beaker		0.158 gal/min
H2S	mg/L	0.00	1225		HS-C Kit		
Colorimeter	mg/L	0.0	1225		Colorimeter		
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 Surface Water Monitoring Field Form

Landowner Comments on water quality:

N/A

Additional information:

Duplicate sample for Yellow Jacket Spg  
 Actual sample time: 1136, time on COC: 1245

1225 H<sub>2</sub>S Colorimeter 0.00 mg/L  
 Hach test kit 0.00 mg/L

Discharge @ 1209 600 mL / 60 sec

Bart bottle; sterile pill was crushed pre-sample. Did not have an extra bottle

Calibration info on RU 11-7 Yellow Jacket Spg

Calibration Information			Date: 3-5-14		Location:			
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 Surface Water Monitoring Field Form

P 1 of 2 <sup>3</sup>

Project Information			
Project:	WPX BWQ	Sample Purpose:	NS subsequent 1 COA9
Site Name (Well Pad):	20 U-7	Site API:	045-06818
Station Name:	Savage Beaver Creek 2	Sample Date:	3-5-14
COGCC Facility ID:	753174	Start Time:	1342
Field Sample ID:	Beaver Cr 2	End Time:	1523
Landowner Name:	Joan Savage	Sample Time:	1355
Landowner Address:	PO Box 1926, Rusk, CO	Sample Team:	SKK, NWS
Water Right/Well Owner:	N/A	Observer:	NWS
Water Right/Well Permit:	N/A	Lead Signature/Date:	[Signature] 3-6-14

Station Information			
Station Description: Beginning of pool after a small fall just off Beaver Cr Road			
Approximate Distance to Well Pad: 5,340 ft			
Station Type: Stream / Spring / Seep / Pond / Lake / NPDES Outfall / Other:			
Sampling Location: Bank / Pipe / Wading / Boat / Bridge / Hose bib / Tank / Other:			
Sampling Location Description: Pool / Riffle / Eddy / Backwater / Open / Channel / Braided / Other:			
Sampling Location Width: 6 ft		Sampling Location Depth: 0.5 ft	
GPS Location:	Zone	x -107.83228	y 39.47212 z 6416

Weather Conditions			
Sky:	Clear / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F): 55°F	
Precipitation:	None / Light / Moderate / Heavy	Precip Type: None / Rain / Sleet / Hail / Snow	
Wind:	Calm / Light / Mod / Strong	Wind Speed/Direction: 2	

Field Measurements								
Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments	
Water Temp	deg C	2.02	1420		YSI 556	In-situ		
pH	s.u.	8.20						
Sp. Conductivity	uS/cm	375						
Conductivity	uS/cm	215						
DO Saturation	%	83.6						
DO	mg/L	11.54						
Baro Press	mmHg	596.3						
ORP	RmV	225.9						
Turbidity	NTU	6.02	1425	AV	Micro TP1		5.98, 6.23, 5.86	
Discharge	CFS	1.71906	1500	Y	Marsh McBirney	In-situ		
H2S	mg/L	0	1443	AV	HS-C Kit			
Colorimeter	mg/L	0.005	1445	AV	Colorimeter			
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				
				ISOtech bottle headspace & pre-size				
Lab Analysis:	Rule 609 / <del>COA 9</del> / COA 22 / Other							
Field Filtered:	Yes <del>NO</del>	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 Surface Water Monitoring Field Form

P2 of 3

Landowner Comments on water quality:

N/A

Additional information:

HS-C test, run 1: 0.0 mg/L @ 1434  
 run 2: 0.0 mg/L @ 1443

Colorimeter, run 1: 0.0 mg/L @ 1436  
 run 2: 0.01 mg/L @ 1445

Should sample slightly further downstream next time. Turbulence made it difficult to achieve zero headspace in Botech bottle. Headspace was 4 pea size.

New sample location ~1360 ft downstream of first sample location.

Calibration info on RU 11-7 yellow jacket spg

Calibration Information			Date: 3-5-14		Location:			
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						



**ATTACHMENT C**

**Data Quality Review Sheets**

## DATA QUALITY REVIEW SHEET

Facility ID: 752709  
 Station Name: Federal 5595  
 Sample Date: 3/5/2014  
 Field Sample ID: Yellow Jacket Spg

Project: WPX BWQ: RU 11-7  
 Lab Work Order: D55643  
 QA/QC Review Date: 5/15/2014  
 Reviewer: S. Kipp

Field Sampling Data Review	Yes	No	N/A
1. Well properly purged?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Flow rate reduced prior to sampling?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Water quality parameters stable prior to sampling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Field instruments calibrated properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sampling methods performed according to SAP procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Procedures consistent with obtaining a representative sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Receipt form is without discrepancies? <i>If no, list in comments.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met (other than lab pH)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Was the field investigation sample matrix used by the lab for matrix QC for all analyses?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. Laboratory qualifiers for data (other than non-detect)? <i>List in comments.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15. Additional qualifiers assigned (other than pH)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16. Are corrective actions required? <i>If yes, list actions and dates to be completed by:</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<i>Corrective Action</i>	<i>Date to be completed</i>		
None			

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	1.615	N/A	N/A	±5%	<input checked="" type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	445.2	336	1.22	0.8 – 1.2	<input type="checkbox"/>
Specific Conductance, µS/cm (SpC)	546	559	0.98	0.8 – 1.2	<input checked="" type="checkbox"/>

**Comments:** pH analyzed out of analysis holding time, WWL qualified with "H"; result considered estimated. Total dissolved solids ratio slightly outside of QC criteria, but data not qualified. The MS recovery for TPH-DRO exceeded guidance criteria; MS recovery for TPH- DRO was low by 1 %.

## DATA QUALITY REVIEW SHEET

Facility ID: 752709  
 Station Name: Federal 5595  
 Sample Date: 3/5/2014  
 Field Sample ID: Spg RU 11-7

Project: WPX BWQ: RU 11-7  
 Lab Work Order: D55644  
 QA/QC Review Date: 5/15/2014  
 Reviewer: S. Kipp

Field Sampling Data Review	Yes	No	N/A
1. Well properly purged?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Flow rate reduced prior to sampling?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Water quality parameters stable prior to sampling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Field instruments calibrated properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sampling methods performed according to SAP procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Procedures consistent with obtaining a representative sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Receipt form is without discrepancies? <i>If no, list in comments.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met (other than lab pH)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Was the field investigation sample matrix used by the lab for matrix QC for all analyses?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. Laboratory qualifiers for data (other than non-detect)? <i>List in comments.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15. Additional qualifiers assigned (other than pH)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16. Are corrective actions required? <i>If yes, list actions and dates to be completed by:</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<i>Corrective Action</i>	<i>Date to be completed</i>		
None			

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	5.430	N/A	N/A	±5%	<input type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	455.6	370	1.23	0.8 – 1.2	<input type="checkbox"/>
Specific Conductance, µS/cm (SpC)	552	564	0.98	0.8 – 1.2	<input checked="" type="checkbox"/>

**Comments:** pH analyzed out of analysis holding time, WWL qualified with "H"; result considered estimated. Total dissolved solids ratio and cation/anion balance slightly outside of QC criteria, but data not qualified. The MS recovery for TPH-DRO exceeded guidance criteria; MS recovery for TPH- DRO was low by 1 %.

## DATA QUALITY REVIEW SHEET

Facility ID: 753174  
 Station Name: Savage Beaver Creek 2  
 Sample Date: 3/5/2014  
 Field Sample ID: Beaver Cr 2

Project: WPX BWQ: RU 11-7  
 Lab Work Order: D55647  
 QA/QC Review Date: 5/15/2014  
 Reviewer: S. Kipp

Field Sampling Data Review	Yes	No	N/A
1. Well properly purged?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Flow rate reduced prior to sampling?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Water quality parameters stable prior to sampling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Field instruments calibrated properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sampling methods performed according to SAP procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Procedures consistent with obtaining a representative sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Receipt form is without discrepancies? <i>If no, list in comments.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met (other than lab pH)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Was the field investigation sample matrix used by the lab for matrix QC for all analyses?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. Laboratory qualifiers for data (other than non-detect)? <i>List in comments.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Additional qualifiers assigned (other than pH)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16. Are corrective actions required? <i>If yes, list actions and dates to be completed by:</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Corrective Action</i>	<i>Date to be completed</i>		
WWL identified discrepancies in the calculation of MS and MSD recovery limits for metals. Accutest made corrections and reissued the report on June 19, 2014.			

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	1.767	N/A	N/A	±5%	<input checked="" type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	281	242	1.16	0.8 – 1.2	<input checked="" type="checkbox"/>
Specific Conductance, µS/cm (SpC)	361	365	0.99	0.8 – 1.2	<input checked="" type="checkbox"/>

**Comments:** pH analyzed out of analysis holding time, WWL qualified with "H"; result considered estimated. 'B' qualifier for alkalinity, carbonate to indicate a result greater than the method detection limit but less than the reporting limit. The MS and MSD recoveries exceeded guidance criteria for, calcium, magnesium, sodium, strontium, and TPH-DRO; MS and MSD for calcium was low by 142 % and 66 %; MS and MSD for magnesium was high by 94 % and 122%; MS and MSD for sodium was low by 146 % and 118%; MS and MSD for strontium was high by 50 % and 70 %; MS recovery for TPH- DRO was low by 1 %.

**ATTACHMENT D**

**Summary of Analytical Results**

WPX BWQ: RU 11-7 Analytical Summary				Federal 5595 752709 6/27/2013 RU 11-7-Yellow Jacket Spg ALS Laboratories (ALS) 1306419-1							Federal 5595 752709 3/5/2014 10:45 YELLOW JACKET SPG Accutest (AMS) D55643-1							Federal 5595 752709 3/5/2014 12:45 SPG RU 11-7 <sup>a</sup> Accutest (AMS) D55644-1						
Station Name Facility ID Sample Date Field Sample ID Analytical Lab Lab Sample ID				Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF			
Reporting Units	ALS Analytic Method	AMS Analytic Method																						
<b>Inorganics</b>																								
Alkalinity AS CaCO3, Total	mg/l	SM2320B	SM 2320B-2011	330			20		1	300			5	2	1	300			5	2	1			
Alkalinity, Bicarbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	330			20		1	300			5	2	1	300			5	2	1			
Alkalinity, Carbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	20	U		20		1	5	U		5	2	1	5	U		5	2	1			
Bromide	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.22			0.2	0.06	1	0.074			0.05	0.025	1	0.071			0.05	0.025	1			
Chloride	mg/l	EPA300.0	EPA 300.0/SW846 9056	9.1			1	0.3	5	8.2			0.5	0.2	1	8.3			0.5	0.2	1			
Fluoride	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.33			0.1	0.03	1	0.23			0.1	0.05	1	0.21			0.1	0.05	1			
Nitrate as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.21		H	0.2	0.06	1	0.11			0.01	0.006	1	0.11			0.01	0.006	1			
Nitrite as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.1	U	H	0.1	0.03	1	0.004	U		0.004	0.003	1	0.004	U		0.004	0.003	1			
pH	s.u.	SM4500-H	SM4500HB+2011/9040C	7.42			0.1		1	7.27		H			1	7.34		H			1			
Specific Conductivity	umhos/cm	SM2510B	SM 2510B-2011	640			1		1	559			1		1	564			1		1			
Sulfate	mg/l	EPA300.0	EPA 300.0/SW846 9056	11 <sup>b</sup>		H	5	1.5	1	11.4			0.5	0.2	1	11.4			0.5	0.2	1			
Total Dissolved Solids	mg/l	SM2540C	SM 2540C-2011	340			20		1	366			10	5	1	370			10	5	1			
Total Phosphorous	mg/l	EPA365.2	HACH8190/SM4500P-B/E	0.25			0.05	0.015	1	0.12			0.01	0.008	1	0.13			0.01	0.008	1			
<b>Dissolved Metals</b>																								
Barium	ug/l	EPA200.8	EPA 200.7	120			1	0.3	10	108			10	1.4	1	112			10	1.4	1			
Boron	ug/l	EPA200.8	EPA 200.7	50	U		50	15	10	50	U		50	6.6	1	50	U		50	6.6	1			
Calcium	ug/l	EPA200.8	EPA 200.7	94000			1000	65	10	91800			400	66	1	101000			400	66	1			
Iron (Ferric)	ug/l	EPA200.8	EPA 200.7	180			100	30	10	50.1			10	3.2	1	61.2			10	3.2	1			
Magnesium	ug/l	EPA200.8	EPA 200.7	17000			100	30	10	18200			200	29	1	18900			200	29	1			
Manganese	ug/l	EPA200.8	EPA 200.7	770			2	0.6	10	668			5	0.29	1	733			5	0.29	1			
Potassium	ug/l	EPA200.8	EPA 200.7	2400			1000	300	10	1830			1000	230	1	1850			1000	230	1			
Selenium	ug/l	EPA200.8	EPA 200.8	1	U		1	0.5	10	0.96			0.8	0.42	2	0.91			0.8	0.42	2			
Sodium	ug/l	EPA200.8	EPA 200.7	14000			1000	300	10	12200			400	36	1	12500			400	36	1			
Strontium	ug/l	EPA200.8	EPA 200.7	450			1	0.3	10	453			5	0.12	1	466			5	0.12	1			
<b>Organics</b>																								
Diesel Range Organics	mg/l	SW8015M	SW846-8015B	0.5	U		0.5	0.15	1	0.19	U		0.19	0.17	1	0.19	U		0.19	0.17	1			
Gasoline Range Organics	ug/l	SW8260_25	SW846 8260B	100	U		100	30	1	200	U		200		1	200	U		200		1			
<b>Dissolved gases<sup>1</sup></b>																								
Ethane	ug/l	RSK175	RSK175 MOD	2	U		2	2	1	1.6	U		1.6	0.8	1	1.6	U		1.6	0.8	1			
Methane	ug/l	RSK175	RSK175 MOD	93			1	1	1	43.6			0.8	0.4	1	46.3			0.8	0.4	1			
Propane	ug/l	RSK175	RSK175 MOD	1	U		1	1	1	2.2	U		2.2	1.1	1	2.2	U		2.2	1.1	1			
<b>VOAs</b>																								
Benzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	1	U		1	0.25	1	1	U		1	0.25	1			
Ethylbenzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	2	U		2	0.25	1	2	U		2	0.25	1			
m+p-Xylene	ug/l	SW8260_25	NM	1	U		1	0.3	1	NM						NM								
o-Xylene	ug/l	SW8260_25	NM	1	U		1	0.3	1	NM						NM								
Xylenes (Total)	ug/l	NM	SW846 8260B	NM						3	U		3	2	1	3	U		3	2	1			
Toluene	ug/l	SW8260_25	SW846 8260B	0.41	J		1	0.3	1	2	U		2	1	1	2	U		2	1	1			

WPX BWQ: RU 11-7 Analytical Summary				Federal 5595 752709 6/27/2013 RU 11-7-Yellow Jacket Spg ALS Laboratories (ALS) 1306419-1							Federal 5595 752709 3/5/2014 10:45 YELLOW JACKET SPG Accutest (AMS) D55643-1							Federal 5595 752709 3/5/2014 12:45 SPG RU 11-7 <sup>a</sup> Accutest (AMS) D55644-1									
Station Name	Facility ID	Sample Date	Field Sample ID	Analytical Lab	Lab Sample ID	Reporting Units	ALS Analytic Method	AMS Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF	
<b>Bacteria</b> <sup>2,3</sup>																											
Iron Related Bacteria	nu	BART	HACH IRB-BART	1					1	1				1	1			25		1	1			25		1	
Slime Forming Bacteria	nu	BART	HACH SLYM-BART	1					1	1				1	1			500		1	1			500		1	
Sulfate Reducing Bacteria	nu	BART	HACH SRB-BART	1					1	1				1	1			200		1	1			200		1	
<b>Field Parameters</b>																											
Bubbles	nu	Field	Field	None					1	None				1	None					1	None					1	
Color	nu	Field	Field	Clear					1	Clear				1	Clear					1	Clear					1	
Conductivity, Field	uS/cm	Field	Field	530					1	361				1	356					1	356					1	
Discharge, measured	gpm	Field	Field	0.17					1	0.139				1	0.158					1	0.158					1	
Dissolved Oxygen, Field	mg/l	Field	Field	1.96					1	6.22				1	5.2					1	5.2					1	
Dissolved Oxygen, Field,%	%	Field	Field	20.3					1	46.8				1	38.6					1	38.6					1	
Effervescence	nu	Field	Field	None					1	None				1	None					1	None					1	
H2S, Field	mg/l	Field	HACH	0.1		E			1	0				1	0					1	0					1	
Odor	nu	Field	Field	None					1	None				1	None					1	None					1	
ORP, field	mv	Field	Field	-25.3					1	70.4				1	42.1					1	42.1					1	
pH, Field	s.u.	Field	Field	7.15					1	7.02				1	7.12					1	7.12					1	
Sediment	uS/cm	Field	Field	None					1	None				1	None					1	None					1	
Specific Conductivity, Field	Deg C	Field	Field	633					1	622				1	627					1	627					1	
Temperature, Water	NTUs	Field	Field	16.4					1	3.05				1	2.22					1	2.22					1	
Turbidity, field	nu	Field	Field	0.65					1	0.85				1	0.98					1	0.98					1	
VOA Headspace	nu	Field	Field	None					1	None				1	None					1	None					1	

Notes:

<sup>a</sup> Blind field duplicate

<sup>b</sup> Reanalyzed by lab 8/22/13 due to error in initial analysis, dilution factor adjusted

<sup>1</sup> AMS units converted from mg/L to ug/L

<sup>2</sup> A result of 1 indicates the presence of bacteria

<sup>3</sup> AMS units for bacteria converted from cfu/ml to no units (detect or non-detect)

U = not detected at the reporting limit

NM = not measured

J = estimated value; lab QA indicates poor precision

H = hold time exceeded; estimated value

AV = averaged value

E = concentration estimated; (cation-anion balance and/or TDS ratio out of WWL acceptance criteria; or separate sampling date)

WPX BWQ: RU 11-7 Analytical Summary				Savage NWSE S1 7S 94W 752708 6/27/2013 RU 11-7-Beaver Creek ALS Laboratories (ALS) 1306419-2						Savage Beaver Creek 2 753174 3/5/2014 13:55 BEAVER CR 2 Accutest (AMS) D55647-1										
Station Name	Facility ID	Sample Date	Field Sample ID	Analytical Lab	Lab Sample ID	Reporting Units	ALS Analytic Method	AMS Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF
<b>Inorganics</b>																				
Alkalinity AS CaCO3, Total	mg/l	SM2320B	SM 2320B-2011	120				20		1	181			5	2	1				
Alkalinity, Bicarbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	120				20		1	177			5	2	1				
Alkalinity, Carbonate as CaCO3	mg/l	SM2320B	SM 2320B-2011	20	U			20		1	4.1			5	2	1				
Bromide	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.2	U			0.2	0.06	1	0.05	U		0.05	0.025	1				
Chloride	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.8				0.2	0.06	1	3.4			0.5	0.2	1				
Fluoride	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.16				0.1	0.03	1	0.12			0.1	0.05	1				
Nitrate as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.23		H		0.2	0.06	1	0.2			0.01	0.006	1				
Nitrite as N	mg/l	EPA300.0	EPA 300.0/SW846 9056	0.1	U	H		0.1	0.03	1	0.004	U		0.004	0.003	1				
pH	s.u.	SM4500-H	SM4500HB+-2011/9040C	8.37				0.1		1	8.21		H							1
Specific Conductivity	umhos/cm	SM2510B	SM 2510B-2011	247				1		1	365			1						1
Sulfate	mg/l	EPA300.0	EPA 300.0/SW846 9056	12				1	0.3	1	20.9			0.5	0.2	1				
Total Dissolved Solids	mg/l	SM2540C	SM 2540C-2011	150				20		1	242			10	5	1				
Total Phosphorous	mg/l	EPA365.2	HACH8190/SM4500P-B/E	0.05	U			0.05	0.015	1	0.43			0.01	0.008	1				
<b>Dissolved Metals</b>																				
Barium	ug/l	EPA200.8	EPA 200.7	37				1	0.3	10	61.2			10	1.4	1				
Boron	ug/l	EPA200.8	EPA 200.7	50	U			50	15	10	9.5			50	6.6	1				
Calcium	ug/l	EPA200.8	EPA 200.7	31000				1000	65	10	50900			400	66	1				
Iron (Ferric)	ug/l	EPA200.8	EPA 200.7	100	U			100	30	10	60.7			10	3.2	1				
Magnesium	ug/l	EPA200.8	EPA 200.7	5600				100	30	10	12100			200	29	1				
Manganese	ug/l	EPA200.8	EPA 200.7	2	U			2	0.6	10	4.1			5	0.29	1				
Potassium	ug/l	EPA200.8	EPA 200.7	1000	U			1000	300	10	1060			1000	230	1				
Selenium	ug/l	EPA200.8	EPA 200.8	1	U			1	0.5	10	0.8	U		0.8	0.42	2				
Sodium	ug/l	EPA200.8	EPA 200.7	11000	U			1000	300	10	15000			400	36	1				
Strontium	ug/l	EPA200.8	EPA 200.7	190				1	0.3	10	337			5	0.12	1				
<b>Organics</b>																				
Diesel Range Organics	mg/l	SW8015M	SW846-8015B	0.5	U			0.5	0.15	1	0.19	U		0.19	0.17	1				
Gasoline Range Organics	ug/l	SW8260_25	SW846 8260B	100	U			100	30	1	200	U		200		1				
<b>Dissolved gases<sup>1</sup></b>																				
Ethane	ug/l	RSK175	RSK175 MOD	2	U			2	2	1	1.6	U		1.6	0.8	1				
Methane	ug/l	RSK175	RSK175 MOD	1	U			1	1	1	0.8	U		0.8	0.4	1				
Propane	ug/l	RSK175	RSK175 MOD	1	U			1	1	1	2.2	U		2.2	1.1	1				
<b>VOAs</b>																				
Benzene	ug/l	SW8260_25	SW846 8260B	1	U			1	0.3	1	1	U		1	0.25	1				
Ethylbenzene	ug/l	SW8260_25	SW846 8260B	1	U			1	0.3	1	2	U		2	0.25	1				
M+P-Xylene	ug/l	SW8260_25	NM	1	U			1	0.3	1	NM									
o-Xylene	ug/l	SW8260_25	NM	1	U			1	0.3	1	NM									
Xylenes (Total)	ug/l	NM	SW846 8260B	NM							3	U		3	2	1				
Toluene	ug/l	SW8260_25	SW846 8260B	1	U			1	0.3	1	2	U		2	1	1				

WPX BWQ: RU 11-7 Analytical Summary				Savage NWSE S1 7S 94W 752708 6/27/2013 RU 11-7-Beaver Creek ALS Laboratories (ALS) 1306419-2						Savage Beaver Creek 2 753174 3/5/2014 13:55 BEAVER CR 2 Accutest (AMS) D55647-1					
Station Name															
Facility ID															
Sample Date															
Field Sample ID															
Analytical Lab															
Lab Sample ID															
	Reporting Units	ALS Analytic Method	AMS Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF
<b>Bacteria</b> <sup>2,3</sup>															
Iron Related Bacteria	nu	BART	HACH IRB-BART	1					1	1			25		1
Slime Forming Bacteria	nu	BART	HACH SLYM-BART	0	U				1	1			500		1
Sulfate Reducing Bacteria	nu	BART	HACH SRB-BART	1					1	1			200		1
<b>Field Parameters</b>															
Bubbles	nu	Field	Field	None					1	None					1
Color	nu	Field	Field	Clear					1	Clear					1
Conductivity, Field	uS/cm	Field	Field	174.4					1	215					1
Discharge, measured	gpm	Field	Field	1969						772					
Dissolved Oxygen, Field	mg/l	Field	Field	9.21					1	11.54					1
Dissolved Oxygen, Field,%	%	Field	Field	82.7					1	83.6					1
Effervescence	nu	Field	Field	Slight					1	None					1
H2S, Field	mg/l	Field	HACH	0.015		E			1	0		AV			1
Odor	nu	Field	Field	None					1	None					1
ORP, field	mv	Field	Field	139.9					1	225.9					1
pH, Field	s.u.	Field	Field	8					1	8.2					1
Sediment	uS/cm	Field	Field	Low					1	None					1
Specific Conductivity, Field	Deg C	Field	Field	240.7					1	375					1
Temperature, Water	NTUs	Field	Field	10.6					1	2.02					1
Turbidity, field	nu	Field	Field	6.22					1	6.02		AV			1
VOA Headspace	nu	Field	Field	None					1	None					1

Notes:

<sup>a</sup> Blind field duplicate

<sup>b</sup> Reanalyzed by lab 8/22/13 due to error in initial analysis, dilution factor adjusted

<sup>1</sup> AMS units converted from mg/L to ug/L

<sup>2</sup> A result of 1 indicates the presence of bacteria

<sup>3</sup> AMS units for bacteria converted from cfu/ml to no units (detect or non-detect)

U = not detected at the reporting limit

NM = not measured

J = estimated value; lab QA indicates poor precision

H = hold time exceeded; estimated value

AV = averaged value

E = concentration estimated; (cation-anion balance and/or TDS ratio out of WWL acceptance criteria;

WPX BWQ: RU 11-7 Analytical Summary																											
Station Name				Trip Blank						Trip Blank 752709						Trip Blank 752709						Trip Blank 753174					
Facility ID				6/27/2013						3/5/2014 0:00						3/5/2014 0:00						3/5/2014 0:00					
Sample Date				Trip Blank						TRIP BLANK						TRIP BLANK						TRIP BLANK					
Field Sample ID				ALS Laboratories (ALS)						Accutest (AMS)						Accutest (AMS)						Accutest (AMS)					
Analytical Lab				1306419-3						D55644-2						D55643-2						D55647-2					
Lab Sample ID				1306419-3						D55644-2						D55643-2						D55647-2					
	Reporting Units	ALS Analytic Method	AMS Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF
<b>Organics</b>																											
Gasoline Range Organics	ug/l	SW8260_25	SW846 8260B	NM						200	U		200		1	200	U		200		1	200	U		200		1
<b>VOAs</b>																											
Benzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	1	U		1	0.25	1	1	U		1	0.25	1	1	U		1	0.25	1
Ethylbenzene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	2	U		2	0.25	1	2	U		2	0.25	1	2	U		2	0.25	1
M+P-Xylene	ug/l	SW8260_25	NM	1	U		1	0.3	1	NM						NM						NM					
o-Xylene	ug/l	SW8260_25	NM	1	U		1	0.3	1	NM						NM						NM					
Xylenes (Total)	ug/l	NM	SW846 8260B	NM						3	U		3	2	1	3	U		3	2	1	3	U		3	2	1
Toluene	ug/l	SW8260_25	SW846 8260B	1	U		1	0.3	1	2	U		2	1	1	2	U		2	1	1	2	U		2	1	1

Notes:

U = not detected at the reporting limit

NM = not measured

**ATTACHMENT E**

**Laboratory Analytical Summary Report**

**Technical Report for**

**WPX Energy Rocky Mountain, LLC**

**WWLCOGJ: RU 11-7 BWQ**

**Accutest Job Number: D55643**

**Sampling Date: 03/05/14**

**Report to:**

**Western Water and Land, Inc.**

**[jpahler@westernwaterandland.com](mailto:jpahler@westernwaterandland.com)**

**ATTN: Jessie Pahler**

**Total number of pages in report: 50**



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)

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Test results relate only to samples analyzed.

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### Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D55643

WWLCOGJ: RU 11-7 BWQ

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D55643-1	03/05/14	10:45	NWS 03/06/14	AQ	Surface Water	YELLOW JACKET SPG
D55643-1F	03/05/14	10:45	NWS 03/06/14	AQ	Surface H2O Filtered	YELLOW JACKET SPG
D55643-2	03/05/14	00:00	NWS 03/06/14	AQ	Trip Blank Water	TRIP BLANK



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** WPX Energy Rocky Mountain, LLC

**Job No** D55643

**Site:** WWLCOGJ: RU 11-7 BWQ

**Report Date** 5/12/2014 3:51:14 PM

On 03/06/2014, 1 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D55643 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

<b>Matrix</b> AQ	<b>Batch ID:</b> V7V1397
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55527-1DUP, D55504-20MS were used as the QC samples indicated.
- D55504-20MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.

### Volatiles by GC By Method RSK175 MOD

<b>Matrix</b> AQ	<b>Batch ID:</b> GFB480
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D55737-1MS, D55737-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Extractables by GC By Method SW846-8015B

<b>Matrix</b> AQ	<b>Batch ID:</b> OP9527
------------------	-------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D55504-16MS, D55504-16MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Outside control limits due to possible matrix interference.

### Metals By Method EPA 200.7

<b>Matrix</b> AQ	<b>Batch ID:</b> MP12457
------------------	--------------------------

- 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) D55638-1MS, D55638-1MSD were used as the QC samples for the metals analysis.

## Metals By Method EPA 200.8

<b>Matrix</b> AQ	<b>Batch ID:</b> MP12447
------------------	--------------------------

- 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) D55622-1MS, D55622-1MSD were used as the QC samples for the metals analysis.

## Wet Chemistry By Method EPA 300.0/SW846 9056

<b>Matrix</b> AQ	<b>Batch ID:</b> GP12088
------------------	--------------------------

- 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) D55622-8MS, D55622-8MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.

## Wet Chemistry By Method HACH IRB-BART

<b>Matrix</b> AQ	<b>Batch ID:</b> MB332
------------------	------------------------

- 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

<b>Matrix</b> AQ	<b>Batch ID:</b> MB333
------------------	------------------------

- 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

<b>Matrix</b> AQ	<b>Batch ID:</b> MB334
------------------	------------------------

- 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

<b>Matrix</b> AQ	<b>Batch ID:</b> GP12105
------------------	--------------------------

- 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) D55584-1MS, D55584-1MSD, D55590-41DUP were used as the QC samples for the Phosphorus, Total analysis.

### Wet Chemistry By Method SM 2320B-2011

**Matrix** AQ **Batch ID:** GN23932

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55548-3ADUP, D55548-3AMS, D55548-3AMSD were used as the QC samples for the Alkalinity, Total as CaCO<sub>3</sub> analysis.

**Matrix** AQ **Batch ID:** GN23933

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

**Matrix** AQ **Batch ID:** GN23934

- 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:** GP12104

- Sample(s) D55590-28DUP were used as the QC samples for the Specific Conductivity analysis.

### Wet Chemistry By Method SM 2540C-2011

**Matrix** AQ **Batch ID:** GN23919

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55656-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

### Wet Chemistry By Method SM4500HB+-2011/9040C

**Matrix** AQ **Batch ID:** GN23894

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D55643-1

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:** D55643  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ  
**Collected:** 03/05/14



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

**D55643-1 YELLOW JACKET SPG**

Methane		0.0436	0.00080	0.00040	mg/l	RSK175 MOD
Alkalinity, Bicarbonate as CaCO3		300	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		300	5.0	2.0	mg/l	SM 2320B-2011
Bromide		0.074	0.050	0.025	mg/l	EPA 300.0/SW846 9056
Chloride		8.2	0.50	0.20	mg/l	EPA 300.0/SW846 9056
Fluoride		0.23	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria		74500	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate		0.11	0.010	0.0060	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total		0.12	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria		6500	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved		366	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity		559	1.0		umhos/cm	SM 2510B-2011
Sulfate		11.4	0.50	0.20	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria		5000	200		CFU/ml	HACH SRB-BART
pH		7.27			su	SM4500HB+ -2011/9040C

**D55643-1F YELLOW JACKET SPG**

Barium		108	10	1.4	ug/l	EPA 200.7
Calcium		91800	400	66	ug/l	EPA 200.7
Iron		50.1	10	3.2	ug/l	EPA 200.7
Magnesium		18200	200	29	ug/l	EPA 200.7
Manganese		668	5.0	0.29	ug/l	EPA 200.7
Potassium		1830	1000	230	ug/l	EPA 200.7
Selenium		0.96	0.80	0.42	ug/l	EPA 200.8
Sodium		12200	400	36	ug/l	EPA 200.7
Strontium		453	5.0	0.12	ug/l	EPA 200.7

**D55643-2 TRIP BLANK**

No hits reported in this sample.

Sample Results

---

Report of Analysis

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## Report of Analysis

<b>Client Sample ID:</b> YELLOW JACKET SPG		
<b>Lab Sample ID:</b> D55643-1		<b>Date Sampled:</b> 03/05/14
<b>Matrix:</b> AQ - Surface Water		<b>Date Received:</b> 03/06/14
<b>Method:</b> SW846 8260B		<b>Percent Solids:</b> n/a
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25284.D	1	03/06/14	JL	n/a	n/a	V7V1397
Run #2							

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

## Purgeable Aromatics+ GRO

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	98%		62-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	92%		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

<b>Client Sample ID:</b> YELLOW JACKET SPG	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55643-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> RSK175 MOD	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB10635.D	1	03/11/14	JJ	n/a	n/a	GFB480
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.0 Deg. C
Run #2				

### Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0436	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	

---

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

<b>Client Sample ID:</b> YELLOW JACKET SPG	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55643-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846-8015B SW846 3510C	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI10679.D	1	03/08/14	JS	03/07/14	OP9527	GFI696
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	68%		10-130%		

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

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

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> YELLOW JACKET SPG	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55643-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

## General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	300	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO <sub>3</sub>	300	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Bromide	0.074	0.050	0.025	mg/l	1	03/06/14 13:39	SK	EPA 300.0/SW846 9056
Chloride	8.2	0.50	0.20	mg/l	1	03/06/14 13:39	SK	EPA 300.0/SW846 9056
Fluoride	0.23	0.10	0.050	mg/l	1	03/06/14 13:39	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	74500	25		CFU/ml	1	03/06/14	MM	HACH IRB-BART
Nitrogen, Nitrate	0.11	0.010	0.0060	mg/l	1	03/06/14 13:39	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.0030 U	0.0040	0.0030	mg/l	1	03/06/14 13:39	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.12	0.010	0.0080	mg/l	1	03/07/14	JD	HACH8190/SM4500P-B/E
Slime Forming Bacteria	6500	500		CFU/ml	1	03/06/14	MM	HACH SLYM-BART
Solids, Total Dissolved	366	10	5.0	mg/l	1	03/11/14	RW	SM 2540C-2011
Specific Conductivity	559	1.0		umhos/cm	1	03/07/14	AK	SM 2510B-2011
Sulfate	11.4	0.50	0.20	mg/l	1	03/06/14 13:39	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	5000	200		CFU/ml	1	03/06/14	MM	HACH SRB-BART
pH	7.27			su	1	03/07/14 13:00	AK	SM4500HB+ -2011/9040C

RL = Reporting Limit  
MDL = Method Detection Limit

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

## Report of Analysis

<b>Client Sample ID:</b> YELLOW JACKET SPG <b>Lab Sample ID:</b> D55643-1F <b>Matrix:</b> AQ - Surface H2O Filtered <b>Project:</b> WWLCOGJ: RU 11-7 BWQ	<b>Date Sampled:</b> 03/05/14 <b>Date Received:</b> 03/06/14 <b>Percent Solids:</b> n/a
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### Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	108	10	1.4	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>
Boron	6.6 U	50	6.6	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Calcium	91800	400	66	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Iron	50.1	10	3.2	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Magnesium	18200	200	29	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Manganese	668	5.0	0.29	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Potassium	1830	1000	230	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>
Selenium	0.96	0.80	0.42	ug/l	2	03/07/14	03/13/14 NT	EPA 200.8 <sup>3</sup>	EPA 200.8 <sup>4</sup>
Sodium	12200	400	36	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>
Strontium	453	5.0	0.12	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>

- (1) Instrument QC Batch: MA4532
- (2) Instrument QC Batch: MA4536
- (3) Instrument QC Batch: MA4548
- (4) Prep QC Batch: MP12447
- (5) Prep QC Batch: MP12457

RL = Reporting Limit  
 MDL = Method Detection Limit

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

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> TRIP BLANK <b>Lab Sample ID:</b> D55643-2 <b>Matrix:</b> AQ - Trip Blank Water <b>Method:</b> SW846 8260B <b>Project:</b> WWLCOGJ: RU 11-7 BWQ	<b>Date Sampled:</b> 03/05/14 <b>Date Received:</b> 03/06/14 <b>Percent Solids:</b> n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25285.D	1	03/06/14	JL	n/a	n/a	V7V1397
Run #2							

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

**Purgeable Aromatics+ GRO**

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	99%		62-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	89%		69-130%

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

4.3  
4

## Misc. Forms

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5

## Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D55643

Client: WWL

Immediate Client Services Action Required: No

Date / Time Received: 3/6/2014 11:20:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: RV 11-7 BWQ

Airbill #'s: CO

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. SmpI Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	Infrared gun	
3. Cooler media:	Ice (bag)	

<u>Quality Control Preservation</u>	<u>Y or N</u>		<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y or N</u>		<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

5.1  
5

## GC/MS Volatiles

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## QC Data Summaries

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Includes the following where applicable:

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

## Method Blank Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1397-MB	7V25279.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55643-1, D55643-2

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

CAS No.	Surrogate Recoveries	Limits	
17060-07-0	1,2-Dichloroethane-D4	100%	62-130%
2037-26-5	Toluene-D8	102%	70-130%
460-00-4	4-Bromofluorobenzene	92%	69-130%

# Blank Spike Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1397-BS	7V25280.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55643-1, D55643-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	49.4	99	70-130
100-41-4	Ethylbenzene	50	54.5	109	70-130
108-88-3	Toluene	50	53.5	107	70-130
1330-20-7	Xylene (total)	150	165	110	70-130

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

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1397-BS	7V25281.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55643-1, D55643-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1690	77	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	99%	62-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	95%	69-130%

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55504-20MS <sup>a</sup>	7V25290.D	1	03/06/14	JL	n/a	n/a	V7V1397
D55504-20 <sup>a</sup>	7V25292.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55643-1, D55643-2

CAS No.	Compound	D55504-20 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
71-43-2	Benzene	ND	50	49.9	100	62-130
100-41-4	Ethylbenzene	ND	50	53.0	106	63-130
108-88-3	Toluene	ND	50	52.1	104	60-130
1330-20-7	Xylene (total)	ND	150	161	107	67-130

CAS No.	Surrogate Recoveries	MS	D55504-20	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	96%	62-130%
2037-26-5	Toluene-D8	103%	103%	70-130%
460-00-4	4-Bromofluorobenzene	97%	89%	69-130%

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

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55504-20MS <sup>a</sup>	7V25291.D	1	03/06/14	JL	n/a	n/a	V7V1397
D55504-20 <sup>a</sup>	7V25292.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55643-1, D55643-2

CAS No.	Compound	D55504-20 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	ND		2200	1820	83	19-168

CAS No.	Surrogate Recoveries	MS	D55504-20	Limits
17060-07-0	1,2-Dichloroethane-D4	93%	96%	62-130%
2037-26-5	Toluene-D8	105%	103%	70-130%
460-00-4	4-Bromofluorobenzene	96%	89%	69-130%

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

\* = Outside of Control Limits.

# Duplicate Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55527-1DUP	7V25283.D	1	03/06/14	JL	n/a	n/a	V7V1397
D55527-1	7V25522.D	1	03/14/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55643-1, D55643-2

CAS No.	Compound	D55527-1 ug/l	DUP Q	D55527-1 ug/l	Q	RPD	Limits
71-43-2	Benzene	ND		ND		nc	30
100-41-4	Ethylbenzene	ND		ND		nc	30
108-88-3	Toluene	ND		ND		nc	30
1330-20-7	Xylene (total)	ND		ND		nc	30
	TPH-GRO (C6-C10)	ND		ND		nc	30

CAS No.	Surrogate Recoveries	DUP	D55527-1	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	92%	62-130%
2037-26-5	Toluene-D8	104%	99%	70-130%
460-00-4	4-Bromofluorobenzene	90%	87%	69-130%

\* = Outside of Control Limits.

## GC Volatiles

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## QC Data Summaries

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Includes the following where applicable:

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

# Method Blank Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB480-MB	FB10629.D	1	03/11/14	JJ	n/a	n/a	GFB480

The QC reported here applies to the following samples:

Method: RSK175 MOD

D55643-1

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:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB480-BS	FB10630.D	10	03/11/14	JJ	n/a	n/a	GFB480

The QC reported here applies to the following samples:

Method: RSK175 MOD

D55643-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.642	126	70-130
74-84-0	Ethane	0.956	1.21	127	70-130
74-98-6	Propane	1.4	1.81	129	67-130

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55737-1MS	FB10632.D	10	03/11/14	JJ	n/a	n/a	GFB480
D55737-1MSD	FB10633.D	10	03/11/14	JJ	n/a	n/a	GFB480
D55737-1	FB10631.D	1	03/11/14	JJ	n/a	n/a	GFB480

The QC reported here applies to the following samples:

Method: RSK175 MOD

D55643-1

CAS No.	Compound	D55737-1 mg/l	Spike Q mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	0.00052	J	0.51	0.549	108	0.51	0.556	1	51-155/30
74-84-0	Ethane	ND		0.956	1.03	108	0.956	1.04	1	58-130/30
74-98-6	Propane	ND		1.4	1.51	108	1.4	1.54	2	46-130/30

\* = Outside of Control Limits.

7.3.1  
 7

## GC Semi-volatiles

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### QC Data Summaries

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Includes the following where applicable:

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

## Method Blank Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9527-MB	FI10645.D	1	03/07/14	JS	03/07/14	OP9527	GFI696

The QC reported here applies to the following samples:

Method: SW846-8015B

D55643-1

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	38% 10-130%

# Blank Spike Summary

**Job Number:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9527-BS	FI10669.D	1	03/08/14	JS	03/07/14	OP9527	GFI696

The QC reported here applies to the following samples:

Method: SW846-8015B

D55643-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.06	41	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:** D55643  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9527-MS	FI10671.D	1	03/08/14	JS	03/07/14	OP9527	GFI696
OP9527-MSD	FI10673.D	1	03/08/14	JS	03/07/14	OP9527	GFI696
D55504-16	FI10677.D	1	03/08/14	JS	03/07/14	OP9527	GFI696

The QC reported here applies to the following samples:

Method: SW846-8015B

D55643-1

CAS No.	Compound	D55504-16 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	1.60	32* a	5	1.86	37	15	33-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D55504-16	Limits
84-15-1	o-Terphenyl	40%	43%	43%	10-130%

(a) Outside control limits due to possible matrix interference.

\* = Outside of Control Limits.

## Metals Analysis

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### QC Data Summaries

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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: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
Matrix Type: AQUEOUS

Methods: EPA 200.8  
Units: ug/l

Prep Date: 03/07/14

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	0.031	<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 MP12447: D55643-1F

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: D55643  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 03/07/14

Metal	D55622-1 Original MS		SpikeLot ICPAL2 % Rec		QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper	anr				
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	0.31	179	200	89.2	70-130
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP12447: D55643-1F

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: D55643  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 03/07/14

Metal	D55622-1 Original MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper	anr				
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	0.31	179	200	89.2	0.0 20
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP12447: D55643-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D55643  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 03/07/14

Metal	BSP Result	Spikelot ICPALL2	QC % Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	191	200	95.5	85-115
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP12447: D55643-1F

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: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	11	11		
Antimony	30	2.1	21		
Arsenic	25	3.8	9		
Barium	10	.2	1.4	0.10	<10
Beryllium	10	.9	1.7		
Boron	50	.8	6.6	1.6	<50
Cadmium	10	.2	.36		
Calcium	400	2.4	66	12.0	<400
Chromium	10	.3	1.4		
Cobalt	5.0	.5	.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	7.4	<200
Manganese	5.0	.5	.29	0.10	<5.0
Molybdenum	10	.4	1.1		
Nickel	30	.5	.87		
Phosphorus	100	15	24		
Potassium	1000	99	230	10.4	<1000
Selenium	50	7.1	9.3		
Silicon	50	4.7	5.6		
Silver	30	.3	.4		
Sodium	400	7.3	36	77.9	<400
Strontium	5.0	.01	.12	0.0	<5.0
Thallium	10	1.8	4.9		
Tin	50	12	13		
Titanium	10	.1	.43		
Uranium	50	2.9	3.9		
Vanadium	10	.4	.39		
Zinc	30	.4	1.9		

Associated samples MP12457: D55643-1F

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

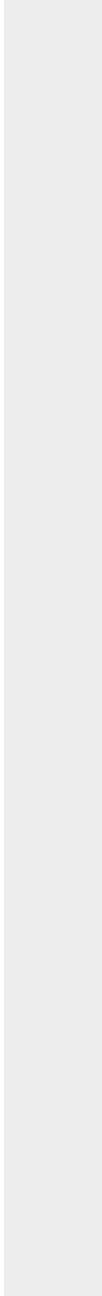
QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

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

(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D55643  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	51.6	2180	2000	106.4	70-130
Beryllium					
Boron	22.9	1190	1000	116.4	70-130
Cadmium					
Calcium	43000	70400	25000	109.6	70-130
Chromium	anr				
Cobalt					
Copper	anr				
Iron	316	5850	5000	110.8	70-130
Lead					
Lithium					
Magnesium	10900	39600	25000	114.8	70-130
Manganese	250	812	500	112.4	70-130
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	3340	30700	25000	109.4	70-130
Selenium					
Silicon					
Silver					
Sodium	34600	61800	25000	108.8	70-130
Strontium	270	819	500	109.8	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP12457: D55643-1F

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: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

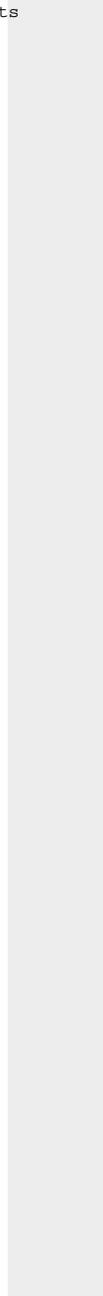
QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 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: D55643  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 Original	MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	51.6	2170	2000	105.9	0.5	20
Beryllium						
Boron	22.9	1150	1000	112.4	3.4	20
Cadmium						
Calcium	43000	68000	25000	100.0	3.5	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	316	5420	5000	102.2	7.6	20
Lead						
Lithium						
Magnesium	10900	36700	25000	103.2	7.6	20
Manganese	250	786	500	107.2	3.3	20
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	3340	30700	25000	109.4	0.0	20
Selenium						
Silicon						
Silver						
Sodium	34600	61100	25000	106.0	1.1	20
Strontium	270	814	500	108.8	0.6	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP12457: D55643-1F

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: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

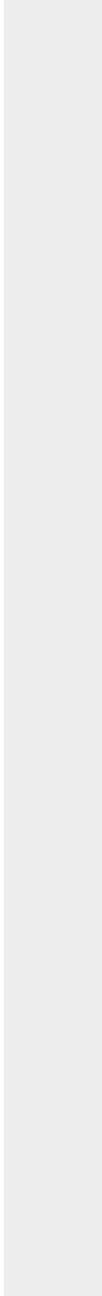
QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 Original MSD	SpikeLot ICPALL2	% Rec	MSD RPD	QC Limit
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(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D55643  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 03/10/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	2110	2000	105.5	85-115
Beryllium				
Boron	1140	1000	114.0	85-115
Cadmium				
Calcium	27100	25000	108.4	85-115
Chromium	anr			
Cobalt				
Copper	anr			
Iron	5270	5000	105.4	85-115
Lead				
Lithium				
Magnesium	27000	25000	108.0	85-115
Manganese	560	500	112.0	85-115
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	27600	25000	110.4	85-115
Selenium				
Silicon				
Silver				
Sodium	26600	25000	106.4	85-115
Strontium	541	500	108.2	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP12457: D55643-1F

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: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

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



9.2.3  
9

## General Chemistry

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### QC Data Summaries

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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: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN23933	5.0	0.0	mg/l	100	98.2	98.2	90-110%
Alkalinity, Carbonate	GN23934	5.0	0.0	mg/l	100	98.2	98.2	80-120%
Alkalinity, Total as CaCO3	GN23932	5.0	0.0	mg/l	100	98.2	98.2	90-110%
Bromide	GP12088/GN23885	0.050	0.0	mg/l	0.5	0.508	101.6	90-110%
Chloride	GP12088/GN23885	0.50	0.0	mg/l	5	4.82	96.4	90-110%
Fluoride	GP12088/GN23885	0.10	0.0	mg/l	1	1.01	101.0	90-110%
Iron Reducing Bacteria	MB332	25	<25	CFU/ml				
Nitrogen, Nitrate	GP12088/GN23885	0.010	0.0	mg/l	0.1	0.0980	98.0	90-110%
Nitrogen, Nitrite	GP12088/GN23885	0.0040	0.0	mg/l	0.05	0.0481	96.2	90-110%
Phosphorus, Total	GP12105/GN23900	0.010	0.0	mg/l	0.38	0.39	103.1	80-120%
Slime Forming Bacteria	MB333	500	<500	CFU/ml				
Solids, Total Dissolved	GN23919	10	0.0	mg/l	400	391	97.8	90-110%
Specific Conductivity	GP12104/GN23898			umhos/cm	99.5	99.9	100.4	90-110%
Sulfate	GP12088/GN23885	0.50	0.0	mg/l	5	4.91	98.2	90-110%
Sulfate Reducing Bacteria	MB334	200	<200	CFU/ml				
pH	GN23894			su	8.00	7.99	99.8	99.3-100.7%

Associated Samples:

- Batch MB332: D55643-1
- Batch MB333: D55643-1
- Batch MB334: D55643-1
- Batch GN23894: D55643-1
- Batch GN23919: D55643-1
- Batch GN23932: D55643-1
- Batch GN23933: D55643-1
- Batch GN23934: D55643-1
- Batch GP12088: D55643-1
- Batch GP12104: D55643-1
- Batch GP12105: D55643-1

(\* ) Outside of QC limits

10.1  
10

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN23932	D55548-3A	mg/l	120	122	1.3	0-20%
Phosphorus, Total	GP12105/GN23900	D55590-41	mg/l	0.024	0.022	8.7	0-20%
Solids, Total Dissolved	GN23919	D55656-1	mg/l	3170	3190	0.6	0-20%
Specific Conductivity	GP12104/GN23898	D55590-28	umhos/cm	388	393	1.3	0-20%

Associated Samples:

Batch GN23919: D55643-1

Batch GN23932: D55643-1

Batch GP12104: D55643-1

Batch GP12105: D55643-1

(\*) Outside of QC limits

10.2  
10

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN23932	D55548-3A	mg/l	120	100	218	97.5	80-120%
Bromide	GP12088/GN23885	D55622-8	mg/l	0.0	0.5	0.56	112.0	80-120%
Chloride	GP12088/GN23885	D55622-8	mg/l	4.0	5	9.3	106.0	80-120%
Fluoride	GP12088/GN23885	D55622-8	mg/l	0.11	1	1.2	109.0	80-120%
Nitrogen, Nitrate	GP12088/GN23885	D55622-8	mg/l	0.38	0.1	0.48	100.0	80-120%
Nitrogen, Nitrite	GP12088/GN23885	D55622-8	mg/l	0.0	0.05	0.060	120.0	80-120%
Phosphorus, Total	GP12105/GN23900	D55584-1	mg/l	0.0	0.4	0.42	103.9	80-120%
Sulfate	GP12088/GN23885	D55622-8	mg/l	11.2	5	16.5	106.0	80-120%

Associated Samples:

Batch GN23932: D55643-1

Batch GP12088: D55643-1

Batch GP12105: D55643-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D55643  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN23932	D55548-3A	mg/l	120	100	219	-0.6	20%
Bromide	GP12088/GN23885	D55622-8	mg/l	0.0	0.5	0.54	3.6	20%
Chloride	GP12088/GN23885	D55622-8	mg/l	4.0	5	9.2	1.1	20%
Fluoride	GP12088/GN23885	D55622-8	mg/l	0.11	1	1.2	0.0	20%
Nitrogen, Nitrate	GP12088/GN23885	D55622-8	mg/l	0.38	0.1	0.48	0.0	20%
Nitrogen, Nitrite	GP12088/GN23885	D55622-8	mg/l	0.0	0.05	0.059	1.7	20%
Phosphorus, Total	GP12105/GN23900	D55584-1	mg/l	0.0	0.4	0.410	1.6	20%
Sulfate	GP12088/GN23885	D55622-8	mg/l	11.2	5	16.4	0.6	20%

Associated Samples:

Batch GN23932: D55643-1

Batch GP12088: D55643-1

Batch GP12105: D55643-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4  
10



05/27/14

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: RU 11-7 BWQ

Accutest Job Number: D55644

Sampling Date: 03/05/14

Report to:

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

Total number of pages in report: **50**



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)

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Test results relate only to samples analyzed.

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### Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D55644

WWLCOGJ: RU 11-7 BWQ

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D55644-1	03/05/14	12:45	SLK	03/06/14	AQ Surface Water	SPG RU 11-7
D55644-1F	03/05/14	12:45	SLK	03/06/14	AQ Surface H2O Filtered	SPG RU 11-7
D55644-2	03/05/14	00:00	SLK	03/06/14	AQ Trip Blank Water	TRIP BLANK



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** WPX Energy Rocky Mountain, LLC

**Job No** D55644

**Site:** WWLCOGJ: RU 11-7 BWQ

**Report Date** 5/27/2014 4:15:31 PM

On 03/06/2014, 1 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D55644 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

<b>Matrix</b> AQ	<b>Batch ID:</b> V7V1397
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55527-1DUP, D55504-20MS were used as the QC samples indicated.
- D55504-20MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.

### Volatiles by GC By Method RSK175 MOD

<b>Matrix</b> AQ	<b>Batch ID:</b> GFB480
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) D55737-1MS, D55737-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Extractables by GC By Method SW846-8015B

<b>Matrix</b> AQ	<b>Batch ID:</b> OP9527
------------------	-------------------------

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55504-16MS, D55504-16MSD were used as the QC samples indicated.
- The matrix spike (MS) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Outside control limits due to possible matrix interference.

### Metals By Method EPA 200.7

<b>Matrix</b> AQ	<b>Batch ID:</b> MP12457
------------------	--------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55638-1MS, D55638-1MSD were used as the QC samples for the metals analysis.

### Metals By Method EPA 200.8

<b>Matrix</b> AQ	<b>Batch ID:</b> MP12447
------------------	--------------------------

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55622-1MS, D55622-1MSD were used as the QC samples for the metals analysis.

### Wet Chemistry By Method EPA 300.0/SW846 9056

**Matrix** AQ **Batch ID:** GP12088

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55622-8MS, D55622-8MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.

### Wet Chemistry By Method HACH IRB-BART

**Matrix** AQ **Batch ID:** MB332

- 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:** MB333

- 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:** MB334

- 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:** GP12105

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55584-1MS, D55584-1MSD, D55590-41DUP were used as the QC samples for the Phosphorus, Total analysis.

### Wet Chemistry By Method SM 2320B-2011

**Matrix** AQ **Batch ID:** GN23932

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55548-3ADUP, D55548-3AMS, D55548-3AMSD were used as the QC samples for the Alkalinity, Total as CaCO<sub>3</sub> analysis.

**Matrix** AQ **Batch ID:** GN23933

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

**Matrix** AQ **Batch ID:** GN23934

- 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:** GP12104

- Sample(s) D55590-28DUP were used as the QC samples for the Specific Conductivity analysis.

### Wet Chemistry By Method SM 2540C-2011

<b>Matrix</b> AQ	<b>Batch ID:</b> GN23919
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- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55656-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

### Wet Chemistry By Method SM4500HB+-2011/9040C

<b>Matrix</b> AQ	<b>Batch ID:</b> GN23894
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- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D55644-1

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:** D55644  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ  
**Collected:** 03/05/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**D55644-1      SPG RU 11-7**

Methane	0.0463	0.00080	0.00040	mg/l	RSK175 MOD
Alkalinity, Bicarbonate as CaCO3	300	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	300	5.0	2.0	mg/l	SM 2320B-2011
Bromide	0.071	0.050	0.025	mg/l	EPA 300.0/SW846 9056
Chloride	8.3	0.50	0.20	mg/l	EPA 300.0/SW846 9056
Fluoride	0.21	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	74500	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	0.11	0.010	0.0060	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.13	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria	12500	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	370	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	564	1.0		umhos/cm	SM 2510B-2011
Sulfate	11.4	0.50	0.20	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	5000	200		CFU/ml	HACH SRB-BART
pH	7.34			su	SM4500HB+ -2011/9040C

**D55644-1F      SPG RU 11-7**

Barium	112	10	1.4	ug/l	EPA 200.7
Calcium	101000	400	66	ug/l	EPA 200.7
Iron	61.2	10	3.2	ug/l	EPA 200.7
Magnesium	18900	200	29	ug/l	EPA 200.7
Manganese	733	5.0	0.29	ug/l	EPA 200.7
Potassium	1850	1000	230	ug/l	EPA 200.7
Selenium	0.91	0.80	0.42	ug/l	EPA 200.8
Sodium	12500	400	36	ug/l	EPA 200.7
Strontium	466	5.0	0.12	ug/l	EPA 200.7

**D55644-2      TRIP BLANK**

No hits reported in this sample.



Sample Results

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Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> SPG RU 11-7	
<b>Lab Sample ID:</b> D55644-1	<b>Date Sampled:</b> 03/05/14
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 03/06/14
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> n/a
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25286.D	1	03/06/14	JL	n/a	n/a	V7V1397
Run #2							

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

**Purgeable Aromatics+ GRO**

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	101%		62-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	92%		69-130%

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

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

4.1  
 4

## Report of Analysis

<b>Client Sample ID:</b> SPG RU 11-7	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55644-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> RSK175 MOD	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB10636.D	1	03/11/14	JJ	n/a	n/a	GFB480
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.0 Deg. C
Run #2				

### Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0463	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	

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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

<b>Client Sample ID:</b> SPG RU 11-7 <b>Lab Sample ID:</b> D55644-1 <b>Matrix:</b> AQ - Surface Water <b>Method:</b> SW846-8015B SW846 3510C <b>Project:</b> WWLCOGJ: RU 11-7 BWQ	<b>Date Sampled:</b> 03/05/14 <b>Date Received:</b> 03/06/14 <b>Percent Solids:</b> n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI10681.D	1	03/08/14	JS	03/07/14	OP9527	GFI696
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	72%		10-130%		

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

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

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> SPG RU 11-7	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55644-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

## General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	300	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Alkalinity, Carbonate	2.0 U	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO <sub>3</sub>	300	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Bromide	0.071	0.050	0.025	mg/l	1	03/06/14 13:51	SK	EPA 300.0/SW846 9056
Chloride	8.3	0.50	0.20	mg/l	1	03/06/14 13:51	SK	EPA 300.0/SW846 9056
Fluoride	0.21	0.10	0.050	mg/l	1	03/06/14 13:51	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	74500	25		CFU/ml	1	03/06/14	MM	HACH IRB-BART
Nitrogen, Nitrate	0.11	0.010	0.0060	mg/l	1	03/06/14 13:51	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.0030 U	0.0040	0.0030	mg/l	1	03/06/14 13:51	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.13	0.010	0.0080	mg/l	1	03/07/14	JD	HACH8190/SM4500P-B/E
Slime Forming Bacteria	12500	500		CFU/ml	1	03/06/14	MM	HACH SLYM-BART
Solids, Total Dissolved	370	10	5.0	mg/l	1	03/11/14	RW	SM 2540C-2011
Specific Conductivity	564	1.0		umhos/cm	1	03/07/14	AK	SM 2510B-2011
Sulfate	11.4	0.50	0.20	mg/l	1	03/06/14 13:51	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	5000	200		CFU/ml	1	03/06/14	MM	HACH SRB-BART
pH	7.34			su	1	03/07/14 13:00	AK	SM4500HB+ -2011/9040C

RL = Reporting Limit  
MDL = Method Detection Limit

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

## Report of Analysis

<b>Client Sample ID:</b> SPG RU 11-7 <b>Lab Sample ID:</b> D55644-1F <b>Matrix:</b> AQ - Surface H2O Filtered <b>Project:</b> WWLCOGJ: RU 11-7 BWQ	<b>Date Sampled:</b> 03/05/14 <b>Date Received:</b> 03/06/14 <b>Percent Solids:</b> n/a
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### Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	112	10	1.4	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>
Boron	6.6 U	50	6.6	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Calcium	101000	400	66	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Iron	61.2	10	3.2	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Magnesium	18900	200	29	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Manganese	733	5.0	0.29	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>5</sup>
Potassium	1850	1000	230	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>
Selenium	0.91	0.80	0.42	ug/l	2	03/07/14	03/13/14 NT	EPA 200.8 <sup>3</sup>	EPA 200.8 <sup>4</sup>
Sodium	12500	400	36	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>
Strontium	466	5.0	0.12	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>5</sup>

- (1) Instrument QC Batch: MA4532
- (2) Instrument QC Batch: MA4536
- (3) Instrument QC Batch: MA4548
- (4) Prep QC Batch: MP12447
- (5) Prep QC Batch: MP12457

RL = Reporting Limit  
 MDL = Method Detection Limit

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

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55644-2	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25287.D	1	03/06/14	JL	n/a	n/a	V7V1397
Run #2							

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

**Purgeable Aromatics+ GRO**

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	99%		62-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	93%		69-130%

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

4.3  
4

## Misc. Forms

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5

## Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D55644

Client: WWL

Immediate Client Services Action Required: No

Date / Time Received: 3/6/2014 11:20:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: RV 11-7 BWQ

Airbill #'s: CO

<b>Cooler Security</b>	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. SmpI Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Cooler Temperature</b>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<b>Quality Control Preservation</b>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

<b>Sample Integrity - Documentation</b>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<b>Sample Integrity - Instructions</b>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

5.1  
5

## GC/MS Volatiles

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## QC Data Summaries

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Includes the following where applicable:

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

## Method Blank Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1397-MB	7V25279.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55644-1, D55644-2

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

CAS No.	Surrogate Recoveries	Limits
17060-07-0	1,2-Dichloroethane-D4	100% 62-130%
2037-26-5	Toluene-D8	102% 70-130%
460-00-4	4-Bromofluorobenzene	92% 69-130%

# Blank Spike Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1397-BS	7V25280.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55644-1, D55644-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	49.4	99	70-130
100-41-4	Ethylbenzene	50	54.5	109	70-130
108-88-3	Toluene	50	53.5	107	70-130
1330-20-7	Xylene (total)	150	165	110	70-130

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

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V1397-BS	7V25281.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55644-1, D55644-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	2200	1690	77	39-144

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	99%	62-130%
2037-26-5	Toluene-D8	103%	70-130%
460-00-4	4-Bromofluorobenzene	95%	69-130%

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55504-20MS <sup>a</sup>	7V25290.D	1	03/06/14	JL	n/a	n/a	V7V1397
D55504-20 <sup>a</sup>	7V25292.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55644-1, D55644-2

CAS No.	Compound	D55504-20 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
71-43-2	Benzene	ND	50	49.9	100	62-130
100-41-4	Ethylbenzene	ND	50	53.0	106	63-130
108-88-3	Toluene	ND	50	52.1	104	60-130
1330-20-7	Xylene (total)	ND	150	161	107	67-130

CAS No.	Surrogate Recoveries	MS	D55504-20	Limits
17060-07-0	1,2-Dichloroethane-D4	98%	96%	62-130%
2037-26-5	Toluene-D8	103%	103%	70-130%
460-00-4	4-Bromofluorobenzene	97%	89%	69-130%

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

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55504-20MS <sup>a</sup>	7V25291.D	1	03/06/14	JL	n/a	n/a	V7V1397
D55504-20 <sup>a</sup>	7V25292.D	1	03/06/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55644-1, D55644-2

CAS No.	Compound	D55504-20 ug/l	Spike Q	MS ug/l	MS %	Limits
	TPH-GRO (C6-C10)	ND	2200	1820	83	19-168

CAS No.	Surrogate Recoveries	MS	D55504-20	Limits
17060-07-0	1,2-Dichloroethane-D4	93%	96%	62-130%
2037-26-5	Toluene-D8	105%	103%	70-130%
460-00-4	4-Bromofluorobenzene	96%	89%	69-130%

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

\* = Outside of Control Limits.

# Duplicate Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55527-1DUP	7V25283.D	1	03/06/14	JL	n/a	n/a	V7V1397
D55527-1	7V25522.D	1	03/14/14	JL	n/a	n/a	V7V1397

The QC reported here applies to the following samples:

Method: SW846 8260B

D55644-1, D55644-2

CAS No.	Compound	D55527-1 ug/l	DUP Q	D55527-1 ug/l	Q	RPD	Limits
71-43-2	Benzene	ND		ND		nc	30
100-41-4	Ethylbenzene	ND		ND		nc	30
108-88-3	Toluene	ND		ND		nc	30
1330-20-7	Xylene (total)	ND		ND		nc	30
	TPH-GRO (C6-C10)	ND		ND		nc	30

CAS No.	Surrogate Recoveries	DUP	D55527-1	Limits
17060-07-0	1,2-Dichloroethane-D4	101%	92%	62-130%
2037-26-5	Toluene-D8	104%	99%	70-130%
460-00-4	4-Bromofluorobenzene	90%	87%	69-130%

\* = Outside of Control Limits.

## GC Volatiles

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## QC Data Summaries

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Includes the following where applicable:

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

# Method Blank Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB480-MB	FB10629.D	1	03/11/14	JJ	n/a	n/a	GFB480

The QC reported here applies to the following samples:

Method: RSK175 MOD

D55644-1

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:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB480-BS	FB10630.D	10	03/11/14	JJ	n/a	n/a	GFB480

The QC reported here applies to the following samples:

Method: RSK175 MOD

D55644-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.642	126	70-130
74-84-0	Ethane	0.956	1.21	127	70-130
74-98-6	Propane	1.4	1.81	129	67-130

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D55737-1MS	FB10632.D	10	03/11/14	JJ	n/a	n/a	GFB480
D55737-1MSD	FB10633.D	10	03/11/14	JJ	n/a	n/a	GFB480
D55737-1	FB10631.D	1	03/11/14	JJ	n/a	n/a	GFB480

The QC reported here applies to the following samples:

Method: RSK175 MOD

D55644-1

CAS No.	Compound	D55737-1		MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD	
		mg/l	Q								
74-82-8	Methane	0.00052	J	0.51	0.549	108	0.51	0.556	109	1	51-155/30
74-84-0	Ethane	ND		0.956	1.03	108	0.956	1.04	109	1	58-130/30
74-98-6	Propane	ND		1.4	1.51	108	1.4	1.54	110	2	46-130/30

\* = Outside of Control Limits.

7.3.1  
 7

## GC Semi-volatiles

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### QC Data Summaries

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Includes the following where applicable:

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

## Method Blank Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9527-MB	FI10645.D	1	03/07/14	JS	03/07/14	OP9527	GFI696

The QC reported here applies to the following samples:

Method: SW846-8015B

D55644-1

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	38% 10-130%

# Blank Spike Summary

**Job Number:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9527-BS	FI10669.D	1	03/08/14	JS	03/07/14	OP9527	GFI696

The QC reported here applies to the following samples:

Method: SW846-8015B

D55644-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.06	41	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:** D55644  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP9527-MS	FI10671.D	1	03/08/14	JS	03/07/14	OP9527	GFI696
OP9527-MSD	FI10673.D	1	03/08/14	JS	03/07/14	OP9527	GFI696
D55504-16	FI10677.D	1	03/08/14	JS	03/07/14	OP9527	GFI696

The QC reported here applies to the following samples:

Method: SW846-8015B

D55644-1

CAS No.	Compound	D55504-16 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	1.60	32* a	5	1.86	37	15	33-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D55504-16	Limits
84-15-1	o-Terphenyl	40%	43%	43%	10-130%

(a) Outside control limits due to possible matrix interference.

\* = Outside of Control Limits.

## Metals Analysis

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### QC Data Summaries

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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: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
Matrix Type: AQUEOUS

Methods: EPA 200.8  
Units: ug/l

Prep Date: 03/07/14

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	0.031	<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 MP12447: D55644-1F

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: D55644  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 03/07/14

Metal	D55622-1 Original MS		SpikeLot ICPAL2 % Rec		QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper	anr				
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	0.31	179	200	89.2	70-130
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP12447: D55644-1F

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: D55644  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 03/07/14

Metal	D55622-1 Original MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper	anr					
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium	0.31	179	200	89.2	0.0	20
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP12447: D55644-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D55644  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12447  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 03/07/14

Metal	BSP Result	Spikelot ICPALL2	QC % Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	191	200	95.5	85-115
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP12447: D55644-1F

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: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	11	11		
Antimony	30	2.1	21		
Arsenic	25	3.8	9		
Barium	10	.2	1.4	0.10	<10
Beryllium	10	.9	1.7		
Boron	50	.8	6.6	1.6	<50
Cadmium	10	.2	.36		
Calcium	400	2.4	66	12.0	<400
Chromium	10	.3	1.4		
Cobalt	5.0	.5	.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	7.4	<200
Manganese	5.0	.5	.29	0.10	<5.0
Molybdenum	10	.4	1.1		
Nickel	30	.5	.87		
Phosphorus	100	15	24		
Potassium	1000	99	230	10.4	<1000
Selenium	50	7.1	9.3		
Silicon	50	4.7	5.6		
Silver	30	.3	.4		
Sodium	400	7.3	36	77.9	<400
Strontium	5.0	.01	.12	0.0	<5.0
Thallium	10	1.8	4.9		
Tin	50	12	13		
Titanium	10	.1	.43		
Uranium	50	2.9	3.9		
Vanadium	10	.4	.39		
Zinc	30	.4	1.9		

Associated samples MP12457: D55644-1F

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

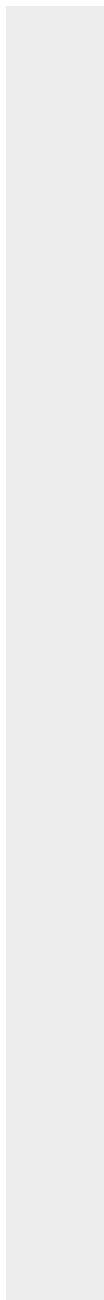
QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

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



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D55644  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 Original MS		SpikeLot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	51.6	2180	2000	106.4	70-130
Beryllium					
Boron	22.9	1190	1000	116.4	70-130
Cadmium					
Calcium	43000	70400	25000	109.6	70-130
Chromium	anr				
Cobalt					
Copper	anr				
Iron	316	5850	5000	110.8	70-130
Lead					
Lithium					
Magnesium	10900	39600	25000	114.8	70-130
Manganese	250	812	500	112.4	70-130
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium	3340	30700	25000	109.4	70-130
Selenium					
Silicon					
Silver					
Sodium	34600	61800	25000	108.8	70-130
Strontium	270	819	500	109.8	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP12457: D55644-1F

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: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

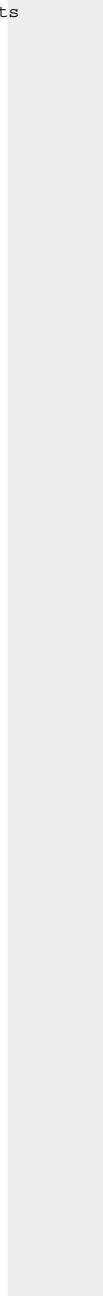
QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 Original MS	SpikeLot ICPAL2	% Rec	QC Limits
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(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D55644  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 Original	MSD	SpikeLot ICPAL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	51.6	2170	2000	105.9	0.5	20
Beryllium						
Boron	22.9	1150	1000	112.4	3.4	20
Cadmium						
Calcium	43000	68000	25000	100.0	3.5	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	316	5420	5000	102.2	7.6	20
Lead						
Lithium						
Magnesium	10900	36700	25000	103.2	7.6	20
Manganese	250	786	500	107.2	3.3	20
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium	3340	30700	25000	109.4	0.0	20
Selenium						
Silicon						
Silver						
Sodium	34600	61100	25000	106.0	1.1	20
Strontium	270	814	500	108.8	0.6	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP12457: D55644-1F

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: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

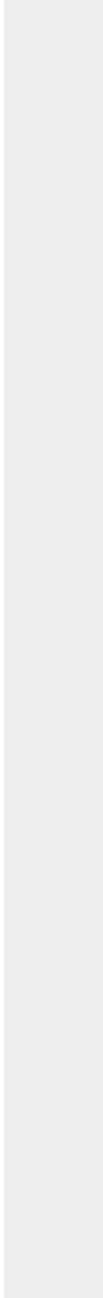
QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

Metal	D55638-1 Original MSD	SpikeLot ICPALL2	% Rec	MSD RPD	QC Limit
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(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D55644  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 03/10/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	2110	2000	105.5	85-115
Beryllium				
Boron	1140	1000	114.0	85-115
Cadmium				
Calcium	27100	25000	108.4	85-115
Chromium	anr			
Cobalt				
Copper	anr			
Iron	5270	5000	105.4	85-115
Lead				
Lithium				
Magnesium	27000	25000	108.0	85-115
Manganese	560	500	112.0	85-115
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium	27600	25000	110.4	85-115
Selenium				
Silicon				
Silver				
Sodium	26600	25000	106.4	85-115
Strontium	541	500	108.2	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP12457: D55644-1F

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: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

QC Batch ID: MP12457  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 03/10/14

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



## General Chemistry

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### QC Data Summaries

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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: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN23933	5.0	0.0	mg/l	100	98.2	98.2	90-110%
Alkalinity, Carbonate	GN23934	5.0	0.0	mg/l	100	98.2	98.2	80-120%
Alkalinity, Total as CaCO3	GN23932	5.0	0.0	mg/l	100	98.2	98.2	90-110%
Bromide	GP12088/GN23885	0.050	0.0	mg/l	0.5	0.508	101.6	90-110%
Chloride	GP12088/GN23885	0.50	0.0	mg/l	5	4.82	96.4	90-110%
Fluoride	GP12088/GN23885	0.10	0.0	mg/l	1	1.01	101.0	90-110%
Iron Reducing Bacteria	MB332	25	<25	CFU/ml				
Nitrogen, Nitrate	GP12088/GN23885	0.010	0.0	mg/l	0.1	0.0980	98.0	90-110%
Nitrogen, Nitrite	GP12088/GN23885	0.0040	0.0	mg/l	0.05	0.0481	96.2	90-110%
Phosphorus, Total	GP12105/GN23900	0.010	0.0	mg/l	0.38	0.39	103.1	80-120%
Slime Forming Bacteria	MB333	500	<500	CFU/ml				
Solids, Total Dissolved	GN23919	10	0.0	mg/l	400	391	97.8	90-110%
Specific Conductivity	GP12104/GN23898			umhos/cm	99.5	99.9	100.4	90-110%
Sulfate	GP12088/GN23885	0.50	0.0	mg/l	5	4.91	98.2	90-110%
Sulfate Reducing Bacteria	MB334	200	<200	CFU/ml				
pH	GN23894			su	8.00	7.99	99.8	99.3-100.7%

Associated Samples:

Batch MB332: D55644-1  
Batch MB333: D55644-1  
Batch MB334: D55644-1  
Batch GN23894: D55644-1  
Batch GN23919: D55644-1  
Batch GN23932: D55644-1  
Batch GN23933: D55644-1  
Batch GN23934: D55644-1  
Batch GP12088: D55644-1  
Batch GP12104: D55644-1  
Batch GP12105: D55644-1

(\* ) Outside of QC limits

10.1  
10

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN23932	D55548-3A	mg/l	120	122	1.3	0-20%
Phosphorus, Total	GP12105/GN23900	D55590-41	mg/l	0.024	0.022	8.7	0-20%
Solids, Total Dissolved	GN23919	D55656-1	mg/l	3170	3190	0.6	0-20%
Specific Conductivity	GP12104/GN23898	D55590-28	umhos/cm	388	393	1.3	0-20%

Associated Samples:

Batch GN23919: D55644-1

Batch GN23932: D55644-1

Batch GP12104: D55644-1

Batch GP12105: D55644-1

(\*) Outside of QC limits

10.2  
10

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN23932	D55548-3A	mg/l	120	100	218	97.5	80-120%
Bromide	GP12088/GN23885	D55622-8	mg/l	0.0	0.5	0.56	112.0	80-120%
Chloride	GP12088/GN23885	D55622-8	mg/l	4.0	5	9.3	106.0	80-120%
Fluoride	GP12088/GN23885	D55622-8	mg/l	0.11	1	1.2	109.0	80-120%
Nitrogen, Nitrate	GP12088/GN23885	D55622-8	mg/l	0.38	0.1	0.48	100.0	80-120%
Nitrogen, Nitrite	GP12088/GN23885	D55622-8	mg/l	0.0	0.05	0.060	120.0	80-120%
Phosphorus, Total	GP12105/GN23900	D55584-1	mg/l	0.0	0.4	0.42	103.9	80-120%
Sulfate	GP12088/GN23885	D55622-8	mg/l	11.2	5	16.5	106.0	80-120%

Associated Samples:

Batch GN23932: D55644-1

Batch GP12088: D55644-1

Batch GP12105: D55644-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.3  
10

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D55644  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: RU 11-7 BWQ

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN23932	D55548-3A	mg/l	120	100	219	-0.6	20%
Bromide	GP12088/GN23885	D55622-8	mg/l	0.0	0.5	0.54	3.6	20%
Chloride	GP12088/GN23885	D55622-8	mg/l	4.0	5	9.2	1.1	20%
Fluoride	GP12088/GN23885	D55622-8	mg/l	0.11	1	1.2	0.0	20%
Nitrogen, Nitrate	GP12088/GN23885	D55622-8	mg/l	0.38	0.1	0.48	0.0	20%
Nitrogen, Nitrite	GP12088/GN23885	D55622-8	mg/l	0.0	0.05	0.059	1.7	20%
Phosphorus, Total	GP12105/GN23900	D55584-1	mg/l	0.0	0.4	0.410	1.6	20%
Sulfate	GP12088/GN23885	D55622-8	mg/l	11.2	5	16.4	0.6	20%

Associated Samples:

Batch GN23932: D55644-1

Batch GP12088: D55644-1

Batch GP12105: D55644-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4  
10

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: RU 11-7 BWQ

Accutest Job Number: D55647

Sampling Date: 03/05/14

Report to:

Western Water and Land, Inc.

bsmith@westernwaterandland.com  
jpahler@westernwaterandland.com  
ATTN: Bruce Smith

Total number of pages in report: **18**



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



Scott Heideman  
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

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

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



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

June 19, 2014

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

Subject: Report Reissue for Accutest Job: D55647

Dear Mr. Smith:

Per the request from your office, Accutest Laboratories has investigated the spike recovery calculations for metals in the above-referenced job. The investigation revealed an error in the automatic upload of instrument data that caused the LIMS system to calculate the spike recoveries using the wrong sample dilutions of the parent, MS and MSD. Retraining of the analyst was conducted to ensure the correct data upload procedure is followed to prevent this error in the future. The report has been corrected to show the correct data and recoveries for the MS and MSD in the metals QC section. In addition, the Case Narrative was revised to reflect iron did pass the MS/MSD recovery limits. 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,

A handwritten signature in black ink, appearing to read 'Scott Heideman', with a long horizontal flourish extending to the right.

Scott Heideman  
Laboratory Director

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### Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D55647

WWLCOGJ: RU 11-7 BWQ

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D55647-1	03/05/14	13:55	SLK	03/06/14	AQ Surface Water	BEAVER CR 2
D55647-1F	03/05/14	13:55	SLK	03/06/14	AQ Surface H2O Filtered	BEAVER CR 2
D55647-2	03/05/14	00:00	SLK	03/06/14	AQ Trip Blank Water	TRIP BLANK

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** WPX Energy Rocky Mountain, LLC

**Job No** D55647

**Site:** WWLCOGJ: RU 11-7 BWQ

**Report Date** 6/19/2014 3:10:11 PM

On 03/06/2014, 1 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 3.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D55647 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:** V7V1397

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55527-1DUP, D55504-20MS were used as the QC samples indicated.
- D55504-20MS: 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:** GFB480

- All samples were analyzed within the recommended method holding time.
- Sample(s) D55737-1MS, D55737-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D55647-1: The pH of the sample was >2 at time of analysis.

### Extractables by GC By Method SW846-8015B

**Matrix:** AQ

**Batch ID:** OP9527

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55504-16MS, D55504-16MSD were used as the QC samples indicated.
- The matrix spike (MS) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Outside control limits due to possible matrix interference.

### Metals By Method EPA 200.7

**Matrix:** AQ

**Batch ID:** MPI2440

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55574-1MS, D55574-1MSD were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Calcium, Magnesium, Sodium, Strontium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## Metals By Method EPA 200.8

**Matrix:** AQ                      **Batch ID:** MP12446

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55623-1AMS, D55623-1AMSD were used as the QC samples for the metals analysis.

## Wet Chemistry By Method EPA 300.0/SW846 9056

**Matrix:** AQ                      **Batch ID:** GP12088

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55622-8MS, D55622-8MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate analysis.

## Wet Chemistry By Method HACH IRB-BART

**Matrix:** AQ                      **Batch ID:** MB332

- 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:** MB333

- 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:** MB334

- 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:** GP12140

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D55872-2MS, D55872-2MSD, D55867-1DUP were used as the QC samples for the Phosphorus, Total analysis.
- The duplicate RPD(s) for Phosphorus, Total are outside control limits for sample GP12140-D1. RPD acceptable due to low duplicate and sample concentrations.



## Summary of Hits

**Job Number:** D55647  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: RU 11-7 BWQ  
**Collected:** 03/05/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**D55647-1 BEAVER CR 2**

Alkalinity, Bicarbonate as CaCO3	177	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Carbonate	4.1 B	5.0	2.0	mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	181	5.0	2.0	mg/l	SM 2320B-2011
Chloride	3.4	0.50	0.20	mg/l	EPA 300.0/SW846 9056
Fluoride	0.12	0.10	0.050	mg/l	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	HACH IRB-BART
Nitrogen, Nitrate	0.20	0.010	0.0060	mg/l	EPA 300.0/SW846 9056
Phosphorus, Total	0.43	0.010	0.0080	mg/l	HACH8190/SM4500P-B/E
Slime Forming Bacteria	6500	500		CFU/ml	HACH SLYM-BART
Solids, Total Dissolved	242	10	5.0	mg/l	SM 2540C-2011
Specific Conductivity	365	1.0		umhos/cm	SM 2510B-2011
Sulfate	20.9	0.50	0.20	mg/l	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	359000	200		CFU/ml	HACH SRB-BART
pH	8.21			su	SM4500HB+ -2011/9040C

**D55647-1F BEAVER CR 2**

Barium	61.2	10	1.4	ug/l	EPA 200.7
Boron	9.5 B	50	6.6	ug/l	EPA 200.7
Calcium	50900	400	66	ug/l	EPA 200.7
Iron	60.7	10	3.2	ug/l	EPA 200.7
Magnesium	12100	200	29	ug/l	EPA 200.7
Manganese	4.1 B	5.0	0.29	ug/l	EPA 200.7
Potassium	1060	1000	230	ug/l	EPA 200.7
Sodium	15000	400	36	ug/l	EPA 200.7
Strontium	337	5.0	0.12	ug/l	EPA 200.7

**D55647-2 TRIP BLANK**

No hits reported in this sample.

Sample Results

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Report of Analysis

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## Report of Analysis

<b>Client Sample ID:</b> BEAVER CR 2	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55647-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25288.D	1	03/06/14	JL	n/a	n/a	V7V1397
Run #2							

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

**Purgeable Aromatics+ GRO**

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	97%		62-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	89%		69-130%

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

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> BEAVER CR 2	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55647-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> RSK175 MOD	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	FB10637.D	1	03/11/14	JJ	n/a	n/a	GFB480
Run #2							

Run #	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.0 Deg. C
Run #2				

### Methane, Ethane and Propane

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

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

---

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

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> BEAVER CR 2	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55647-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846-8015B SW846 3510C	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FI10683.D	1	03/08/14	JS	03/07/14	OP9527	GFI696
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	61%		10-130%		

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

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

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> BEAVER CR 2	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55647-1	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

## General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	177	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Alkalinity, Carbonate	4.1 B	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO <sub>3</sub>	181	5.0	2.0	mg/l	1	03/11/14	BF	SM 2320B-2011
Bromide	0.025 U	0.050	0.025	mg/l	1	03/06/14 14:03	SK	EPA 300.0/SW846 9056
Chloride	3.4	0.50	0.20	mg/l	1	03/06/14 14:03	SK	EPA 300.0/SW846 9056
Fluoride	0.12	0.10	0.050	mg/l	1	03/06/14 14:03	SK	EPA 300.0/SW846 9056
Iron Reducing Bacteria	9000	25		CFU/ml	1	03/06/14	MM	HACH IRB-BART
Nitrogen, Nitrate	0.20	0.010	0.0060	mg/l	1	03/06/14 14:03	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.0030 U	0.0040	0.0030	mg/l	1	03/06/14 14:03	SK	EPA 300.0/SW846 9056
Phosphorus, Total	0.43	0.010	0.0080	mg/l	1	03/14/14	JD	HACH8190/SM4500P-B/E
Slime Forming Bacteria	6500	500		CFU/ml	1	03/06/14	MM	HACH SLYM-BART
Solids, Total Dissolved	242	10	5.0	mg/l	1	03/11/14	RW	SM 2540C-2011
Specific Conductivity	365	1.0		umhos/cm	1	03/07/14	AK	SM 2510B-2011
Sulfate	20.9	0.50	0.20	mg/l	1	03/06/14 14:03	SK	EPA 300.0/SW846 9056
Sulfate Reducing Bacteria	359000	200		CFU/ml	1	03/06/14	MM	HACH SRB-BART
pH	8.21			su	1	03/07/14 13:00	AK	SM4500HB+ -2011/9040C

RL = Reporting Limit  
MDL = Method Detection Limit

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

## Report of Analysis

<b>Client Sample ID:</b> BEAVER CR 2 <b>Lab Sample ID:</b> D55647-1F <b>Matrix:</b> AQ - Surface H2O Filtered <b>Project:</b> WWLCOGJ: RU 11-7 BWQ	<b>Date Sampled:</b> 03/05/14 <b>Date Received:</b> 03/06/14 <b>Percent Solids:</b> n/a
---	---

### Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	61.2	10	1.4	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>4</sup>
Boron	9.5 B	50	6.6	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>4</sup>
Calcium	50900	400	66	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>4</sup>
Iron	60.7	10	3.2	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>4</sup>
Magnesium	12100	200	29	ug/l	1	03/10/14	03/11/14 KV	EPA 200.7 <sup>2</sup>	EPA 200.7 <sup>4</sup>
Manganese	4.1 B	5.0	0.29	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>4</sup>
Potassium	1060	1000	230	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>4</sup>
Selenium	0.42 U	0.80	0.42	ug/l	2	03/07/14	03/11/14 NT	EPA 200.8 <sup>3</sup>	EPA 200.8 <sup>5</sup>
Sodium	15000	400	36	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>4</sup>
Strontium	337	5.0	0.12	ug/l	1	03/10/14	03/10/14 KV	EPA 200.7 <sup>1</sup>	EPA 200.7 <sup>4</sup>

- (1) Instrument QC Batch: MA4532
- (2) Instrument QC Batch: MA4536
- (3) Instrument QC Batch: MA4538
- (4) Prep QC Batch: MP12440
- (5) Prep QC Batch: MP12446

RL = Reporting Limit  
 MDL = Method Detection Limit

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

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> TRIP BLANK	<b>Date Sampled:</b> 03/05/14
<b>Lab Sample ID:</b> D55647-2	<b>Date Received:</b> 03/06/14
<b>Matrix:</b> AQ - Trip Blank Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8260B	
<b>Project:</b> WWLCOGJ: RU 11-7 BWQ	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V25289.D	1	03/06/14	JL	n/a	n/a	V7V1397
Run #2							

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

**Purgeable Aromatics+ GRO**

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	97%		62-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	87%		69-130%

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

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## Misc. Forms

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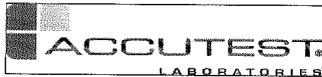
5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

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

FED-EX Tracking #	Bottle Order Control #
Accutest Quote # <b>SMS-2013-245</b>	Accutest Job # <b>D55647</b>

Client / Reporting Information		Project Information										Requested Analysis (see TEST CODE sheet)										Matrix Codes						
Company Name <b>Western Water and Land, Inc.</b>		Project Name <b>RU 11-7 BWO</b>										PH, SCOR, TDS XCARBICALK BRO, CHL, F, NO2, NO30, SO4 TPO4 *Dissolved Metals - Lab Filtered VRSK175DGMEP V8260BTXGRO B8015DRO BART **Isotopic Methane										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						
Street Address <b>743 Horizon Ct., Suite 330</b>		Street <b>743 Horizon Ct., Suite 330</b>																										
City <b>Grand Junction, CO 81506</b>		Billing Information (If different from Report to) Company Name <b>WPX Energy</b>																										
Project Contact <b>Bruce Smith bsmith@westernwaterandland.com</b>		Street Address <b>1058 LL 215</b>																										
Phone # <b>(970) 242-0170</b>		City <b>Parachute, CO 81665</b>																										
Sampler(s) Name(s) <b>Shelby Kipp</b>		Project Manager <b>Brandon Danforth</b>																										
Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection		Number of preserved Bottles																				LAB USE ONLY			
			Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEDH	ENCODE	PH	SCOR	TDS	XCARBICALK	BRO, CHL, F, NO2, NO30, SO4	TPO4	*Dissolved Metals - Lab Filtered	VRSK175DGMEP	V8260BTXGRO		B8015DRO	BART	**Isotopic Methane
	Beaver Cr 2		3-5-14	1355	SKL SW	15	3											1	1	1	1	1	3	3	2	1	1	01
	TB1, TB2																											TS-02
	Temp blank																											3/6/14
	Beaver Cr 2		Field Parameters: pH(s.u.): Temp(C): Sp. Cond(uS/cm): DO(%): DO(mg/L) ORP(mv): TURB(NTU):																									
			8.20 20.2 375 83.6 11.54 2559 6.02 (averaged)																									

Turnaround Time (Business days)		Data Deliverable Information										Comments / Special Instructions									
<input checked="" type="checkbox"/> Std. 15 Business Days <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day Emergency <input type="checkbox"/> 2 Day Emergency <input type="checkbox"/> 1 Day Emergency Emergency & Rush TIA data available VIA Lablink		Approved By (Accutest PM): / Date: <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> State Forms Required <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> Send Forms to State <input type="checkbox"/> COMMBN <input type="checkbox"/> Report by Fax <input type="checkbox"/> COMMBN+ <input type="checkbox"/> Report by PDF <input type="checkbox"/> EDD Format Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial BN = Results/QC/Narrative (+ = chromatograms)										*Dissolved Metals (200.7/200.8): Ba, B, Ca, Fe, Mg, Mn, K, Se, Na, Sr **Hold pending RSK175 results Analyze trip blanks Unable to get 150 headspace free due to maintenance									
Relinquished by Sampler: 1 <b>Shelby Kipp</b> 3-5-14 @ 1545		Received By: 1 <b>Field Service Center</b>										Date Time: 2									
Relinquished by Sampler: 3		Received By: 3										Date Time: 4									
Relinquished by: 5		Received By: 5										Date Time: 4									
		Custody Seal # <b>4D/CU</b> <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not Intact										Preserved where applicable <input checked="" type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp. <b>3.1</b>									

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D55647: Chain of Custody

Page 1 of 2



# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D55647

Client: WWL

Immediate Client Services Action Required: No

Date / Time Received: 3/6/2014 11:20:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: RU 11-7 BWQ

Airbill #'s: CO

<b>Cooler Security</b>	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smp'l Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Cooler Temperature</b>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<b>Quality Control Preservation</b>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

<b>Sample Integrity - Documentation</b>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<b>Sample Integrity - Instructions</b>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Accutest Laboratories  
V:(303) 425-6021

4036 Youngfield Street  
F: (303) 425-6854

Wheat Ridge, CO  
www.accutest.com

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