



Western Water & Land, Inc.

January 13, 2014

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

**RE: SG 31-32 Completions Pit First Subsequent Sample Event Results Report,  
September 2013 Event**

Dear Mr. Danforth,

Western Water & Land, Inc. (WWL) has completed the first subsequent water sampling event for the WPX Energy Rocky Mountain LLC (WPX) SG 31-32 Completions Pit in accordance with COGCC Condition of Approval 9 (COA 9). The initial baseline sampling event was conducted in June, 2013 (see SG 31-32 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 ACTIVITIES**

As described in the SG 31-32 Drill Pad Baseline Water Quality Evaluation, May 7, 2013, two potential sampling locations were identified for field sampling of water quality consistent with requirements of COA 9. According to state records, the landowners, water well permit holders or water right holders were mailed access request letters by way of certified U.S. Postal Service mail. One spring and one surface water sample were identified as preferred sampling locations:

- Colorado River (NW ¼ NE ¼ S. 5, T8S, R96W)
- Water Well Permit No. 192819

WPX was granted permission to sample all two water sources. The landowner, Mr. Donald Van Hoose, is the applicant of Well Permit No. 192819, in which a variance was granted to convert a hillside spring into a shallow well. The formal name of the spring is Una Ranch Spring, however, the spring has been sampled in the past and is referred to as Van Hoose Spring in the COGCC database. The actual spring emanation point is outside of the 1.0-mile radius, but the water is piped to Mr. Van Hoose's residence, which is located within the 1.0-mile radius (Figure 1). The spring was sampled at a pipe that discharges from a collection box near its emanation point. The spring is located on a parcel belonging to KR Holdings, LLC. The water right is listed as being owned by William Colohan, but was probably transferred to Van Hoose at a later date.

Three samples for the first subsequent sampling event were collected for the SG 31-32 Completions Pit. Sample SG 31-32-192819 was collected from Water Well Permit No. 192819, sample SG 31-32-417214 was also collected from Water Well Permit No. 192819 as a duplicate, and sample SG 31-32-CO River was collected from the Colorado River. Sampling of these water sources was initiated on September 16<sup>th</sup>, 2013. At Van Hoose Spring, groundwater is conveyed through a pipe buried about 20 feet horizontally in the hillside and passing through a capped concrete box or cistern; the spring water sample was collected from the cistern outflow pipe.

A large eddy had formed where the Colorado River was previously sampled so the closest upstream location with active flow was selected as the sample site. The sample was taken in a mild riffle section upriver about 100 feet from the previous sample (June 3<sup>rd</sup>, 2013) adjacent to a cobble bank on the south bank of the river. In addition to WWL sampling personnel, Mrs. Van Hoose was present during the sampling event. COA 9 requires that surface flow within Smith Gulch, if present, be sampled upgradient and downgradient of the SG 31-32 pad. No flow was present in Smith Gulch, and therefore, no sampling at this location occurred. Figure 1 shows the sampled locations. Photographs of the sampling sites are shown in Attachment A. Field monitoring forms are shown in Attachment B.

All sampling procedures followed the Colorado Oil & Gas Conservation Commission (COGCC) Model Sampling and Analysis Plan (SAP) protocols. Sampling Method 2 for springs and seeps, described in Version 1 of the COGCC Model SAP, was used to collect both of these samples.

Samples were carefully packed in plastic ice chests (coolers) with ice and shipped to the analytical laboratory (Accutest Mountain States Laboratory (AMS), Wheat Ridge, Colorado) by way of overnight courier (FedEx Ground).

## **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 the assignment of data qualifiers. In addition, WWL conducted post-analysis evaluations of cation-anion balance (CAB) and total dissolved solids (calculated/measured ratio); additional qualifiers were assigned to analytical results as necessary.

### **Field Procedures**

WWL conducted field sampling procedures in accordance with the COGCC Model SAP. Sampling at SG 31-32-192819 (Van Hoose Spring) was conducted at an end-of-pipe location. 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. Sample site SG 31-32-CO River was also sampled in situ by direct filling methods; dissolved gas sampling was done using Method 2 for spring and seep sampling. No field procedure deviations or incidents 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 information. The analytes requested matched the requirements of COA 9. DRO (diesel range organics) and GRO (gasoline range organics) were designated on the COC in place of TPH, a required analysis for COA 9. No other errors or pertinent information was observed, and no corrections were needed.

### **Sample Receipt**

The samples were received in two coolers within the temperature range criteria ( $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ). Custody seals were intact. The sample receipt form did not identify any discrepancies. 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 pH for all samples. WWL assigned and “H” qualifier to the pH results to indicate the results are considered estimated.

### **Analytical Methods**

The analytical methods used by the laboratory were checked for consistency with the analytical schedule in the SAP or other pertinent documents. Analytical methods were found to be consistent with some 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; no deviations were observed except as applied to increased dilution factors. Sample SG 31-32-CO River had a dilution factor of 10 for sulfate and chloride, a dilution factor of 5 for phosphorous, a dilution factor of 2 for selenium, and a dilution factor of 1 for all other analytes. Samples SG 31-32-192819 and SG 31-32-417214 had a dilution factor of 20 for sulfate, a dilution factor of 2 for bromide, chloride, fluoride, nitrate, nitrite, and selenium, and a dilution factor of 1 for all other analytes. The detection limit for nitrite as nitrogen was elevated due to matrix interference.

AMS reports sample results at the reporting limit as “undetected” or “U”, or “not detected” or “ND” rather than reporting results as less than the detection reporting limit, e.g.  $< 0.05\mu\text{g/L}$ .

### **Completeness**

Data completeness is a measure of requested analysis and received results. The analytical constituents required under COA 9 were compared to those 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 COA 9. 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 calculations were performed for each sample; if the CAB exceeded 5 percent, i.e.  $< 95$  percent or  $>105$  %, 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 CAB calculations for the samples are as follows:

- SG 31-32-192819: 0.74%

- SG 31-32-417214: 2.16%
- SG 31-32-CO River: 1.05%

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 and 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 1.5 and greater, 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:

- SG 31-32-192819: 1.12
- SG 31-32-417214: 1.12
- SG 31-32-CO River: 1.10

No sample results were rejected on the basis of the TDS ratio. No qualifiers were assigned 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 using the calculation of the relative percent difference (RPD) using the analytical results from the original investigative sample and the duplicate sample. The qualification criteria were considered an RPD limit of 35%. 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 SG 31-32-417214) was collected for well permit number 192819 (sample SG 31-32-192819). Detectable results occurred for both iron related bacteria and TPH-DRO in the original sample (SG 31-32-192819) but concentrations were not detected in the duplicate sample (SG 31-32-417214). In this case, the RPD acceptance criteria of 35% is not applied because the analytical precision cannot be adequately assessed. Based on the field duplicate RPDs, the data were not qualified.

However, the high RPD for the matrix spike and matrix spike duplicate data for TPH-DRO is indicative of poor precision. WWL will assign a J qualifier to the TPH-DRO results for sample SG 31-32-192819 indicating an estimated result. The analytical laboratory does not conduct QC analysis for the BART parameters.

### **Laboratory Quality Control**

The analytical laboratory conducts an extensive quality control program and as part of the overall quality control process, WWL verified that the lab performed and reported quality control data correctly. This included checking laboratory control samples for a laboratory acceptance criteria of  $\pm$  20 percent and reviewing percent recoveries of analytical spike and analytical spike duplicates and other control samples. Typical percent recovery acceptance limits are 70 to 130 percent. All sampling event

data packages from the lab showed that no laboratory control samples exceeded the 20 percent criteria without data qualification.

All laboratory quality control standards were met within the established laboratory acceptance criteria.

### **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 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. No qualifiers were assigned by the laboratory because of percent recoveries exceeding the laboratory acceptance criteria.

AMS qualified the benzene result from the matrix spike for samples SG 31-32-192819 and SG 31-32-417214 with an "E" to indicate the result exceeded the calibration range. However, this involved a matrix sample that was not one of the submitted WPX baseline (field) samples, and was related to a concentration range well above the undetected results for the baseline samples. Therefore, the qualifier will not be applied to the field samples.

For the purposes of this report, it is assumed that the use of matrix spike samples that are not associated with the field samples but reflect similar ambient field sample concentrations, is acceptable in evaluating quality control of the field sample data. AMS conducted quality control matrix spike analysis using non-project field samples within the same range as the ambient concentrations of the field samples; the results were within acceptable limits. Based on the above assumption, data will not be qualified.

### **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. The RPDs were compared to the laboratory acceptance limit of 20 percent. RPDs were not used when the sample concentration was too low (< 10X MDL) for accurate evaluation. Laboratory RPDs were within the acceptance limit of 20 percent with the exception of the matrix spike and matrix spike duplicate for TPH-DRO (170 percent). AMS listed the probable cause due to "sample homogeneity". No qualifiers were assigned by the laboratory because of RPD values exceeding the laboratory acceptance criteria.

However, the high RPD for the matrix spike and matrix spike duplicate data for TPH-DRO is indicative of poor precision. WWL will assign a J qualifier to the TPH-DRO results for sample SG 31-32-192819 and sample SG 31-32-CO River indicating an estimated result. The analytical laboratory does not conduct QC analysis for the BART parameters.

Data Quality Review Sheets are presented in Attachment C.

## **ANALYTICAL RESULTS**

Laboratory analysis was performed by Accutest Mountain States, Wheatridge, CO 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. A geochemical interpretation of the analytical results can be provided upon request.

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

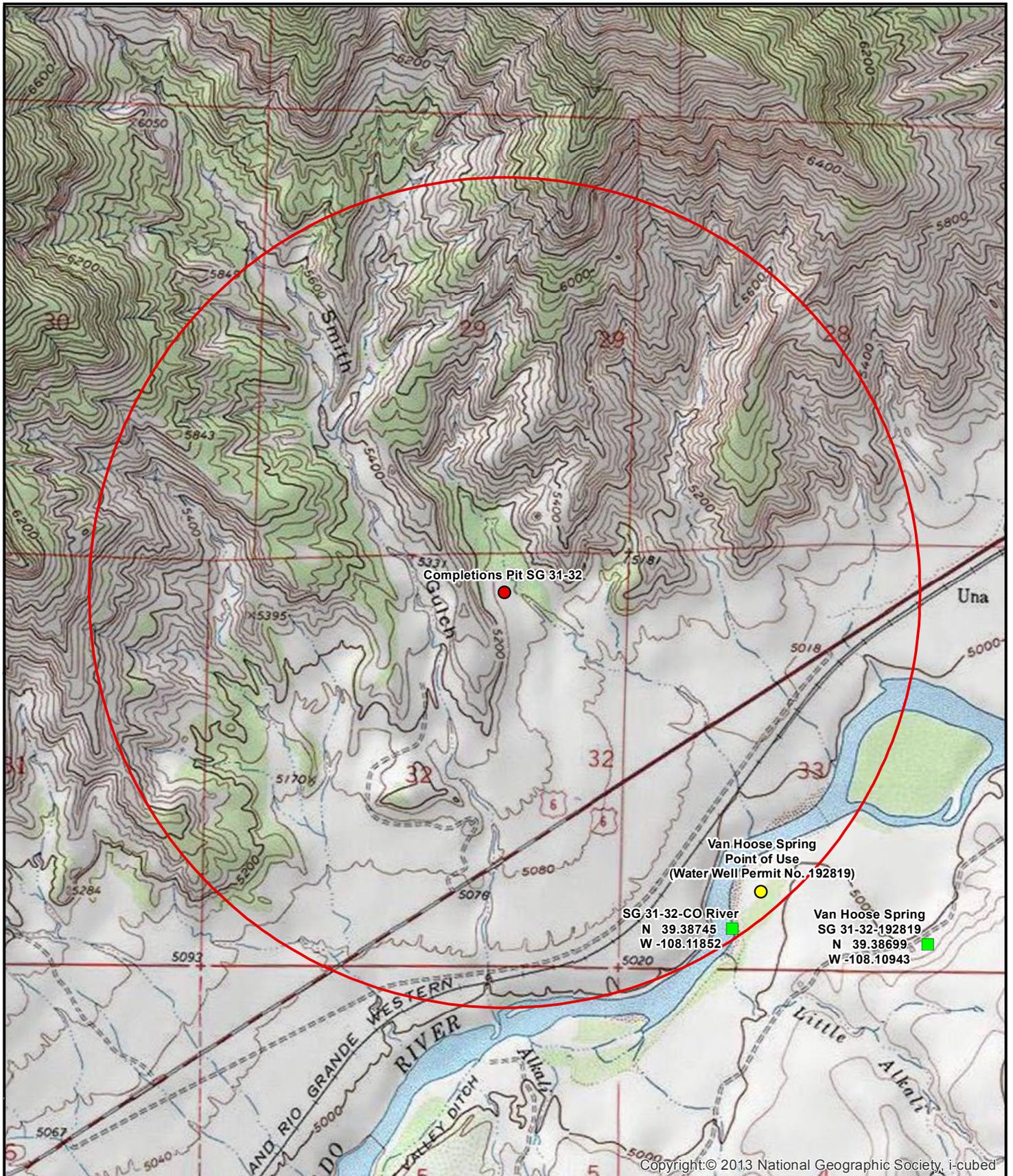
Sincerely,

A handwritten signature in black ink that reads "Bruce D. Smith". The signature is written in a cursive style with a large initial "B" and a stylized "S".

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



**Figure 1: SG 31-32 Completions Pit Sample Location Map  
 One Mile Radius Water Source Evaluation  
 NW1/4, NE1/4, S32, T7S, R96W, 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. Colorado River Sampling Location (SG 31-32-CO River)**



**Photo 2. Colorado River Sampling Location (SG 31-32-CO River)**



**Photo 3. Van Hoose Spring Sampling Location (SG 31-32-192819 & SG 31-32-417214)**



**Photo 4. Van Hoose Spring Sampling Location (SG 31-32-192819 & SG 31-32-417214)**

**ATTACHMENT B**

**Field Monitoring Forms**

## WPX BWQ Surface Water Monitoring Field Form

| Project Information      |                       |                      |                      |
|--------------------------|-----------------------|----------------------|----------------------|
| Project:                 | WPX BWQ               | Sample Purpose:      | COA 9 1st Subsequent |
| Site Name (Well Pad):    | SG 31-32              | Site API:            | Q                    |
| Station Name:            | VanHoose Spring       | Sample Date:         | 9-16-13              |
| COGCC Facility ID:       | 707963                | Start Time:          | 1040                 |
| Field Sample ID:         | SG 31-32-192819       | End Time:            | 1100                 |
| Landowner Name:          | Donald + Eva VanHoose | Sample Time:         | AWS, SLG 1045        |
| Landowner Address:       | 0875 CR 339           | Sample Team:         | NWS, SLG             |
| Water Right/Well Owner:  | Donald + Eva VanHoose | Observer:            | SLG                  |
| Water Right/Well Permit: | 192819                | Lead Signature/Date: | 9-16-13              |

| Station Information               |   |
|-----------------------------------|---|
| Station Description:              | Sampled from pipe sticking out of cistern                                 |
| Approximate Distance to Well Pad: | 7,000 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: pipe |
| Sampling Location Width:          | Sampling Location Depth:  |
| GPS Location:                     | 125 Zone 748951 x 4363710 y NM z  |

| Weather Conditions |                                       |                             |                                   |
|--------------------|---------------------------------------|-----------------------------|-----------------------------------|
| Sky:               | Clear / Scattered / Cloudy / Overcast | Estimated Air Temp (deg F): | 80                                |
| Precipitation:     | None / Light / Moderate / Heavy       | Precip Type:                | None / Rain / Sleet / Hail / Snow |
| Wind:              | Calm / Light / Mod / Strong           | Wind Speed/Direction:       | NM                                |

| Field Measurements |   |         |                   |   |             |                      |                  |
|--------------------|---|---------|-------------------|---|-------------|----------------------|------------------|
| Parameter          | Units   | Reading | Time              | Flag Code                                     | Instrument  | In-situ or Container | Comments         |
| Water Temp         | deg C   | 10.5    | 1058              |   | YSI Pro     | Container            |                  |
| pH                 | s.u.  | 7.22    |                   |   |             |                      |                  |
| Sp. Conductivity   | uS/cm   | 1098    |                   |   |             |                      |                  |
| Conductivity       | uS/cm   | 794     |                   |   |             |                      |                  |
| DO Saturation      | %   | 52.1    |                   |   |             |                      |                  |
| DO                 | mg/L  | 5.87    |                   |   |             |                      |                  |
| Baro Press         | mmHg  | 637.8   |                   |   |             |                      |                  |
| ORP                | RmV   | 121.6   |                   |   |             |                      |                  |
| Turbidity          | NTU   | 0.50    | 1106              | AV  | Micro Tpi   |                      | 0.58, 0.47, 0.46 |
| Discharge          | gal/min   | 21      | 1055              | AV  | 5gal bucket |                      |                  |
| H2S                | mg/L  | 0.005   |                   | 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 |             |                      |                  |
| Lab Analysis:      | Rule 609 / COA 9 / COA 22 / Other                     |         |                   |   |             |                      |                  |
| Field Filtered:    | Yes / 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:

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Additional information:

Discharge 5gal / 14.14 sec  
 5gal / 14.31 sec AV: 21 gal/min  
 5gal / 14.14 sec

Note: approx half of Springs discharge, discharge measurement used for duplicate sample

Calibration info on SG31-32-CO River Field Form

H<sub>2</sub>S info on SG31-32-417214 Field Form

| Calibration Information |           |       | Date: |                            |                                | 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

Dup of SG 31-32-192819

| Project Information      |                        |                      |                      |
|--------------------------|------------------------|----------------------|----------------------|
| Project:                 | WPX BWQ                | Sample Purpose:      | COA 9 1st Subsequent |
| Site Name (Well Pad):    | SG 31-32               | Site API:            | Q                    |
| Station Name:            | Van Hoose Spring       | Sample Date:         | 9-16-13              |
| COGCC Facility ID:       | 707963                 | Start Time:          | 1100                 |
| Field Sample ID:         | SG 31-32-417214 (Dup)  | End Time:            | 1137                 |
| Landowner Name:          | Donald + Eva Van Hoose | Sample Time:         | 1107; 1320 on labels |
| Landowner Address:       | 0876 CR 339            | Sample Team:         | NWS, SLG             |
| Water Right/Well Owner:  | Donald + Eva Van Hoose | Observer:            | SLG                  |
| Water Right/Well Permit: | 192819                 | Lead Signature/Date: | 9-16-13              |

| Station Information  |     |                          |                         |
|--|-----|--------------------------|-------------------------|
| Station Description: Sampled from pipe sticking out of cistern   |     |                          |                         |
| Approximate Distance to Well Pad: 7,000 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: Pipe |     |                          |                         |
| Sampling Location Width:   |     | Sampling Location Depth: |                         |
| GPS Location:  | 125 | Zone                     | 748951 x 4363710 y NM z |

| Weather Conditions |                                       |  |  |
|--------------------|---------------------------------------|--|--|
| Sky:               | Clear / Scattered / Cloudy / Overcast | Estimated Air Temp (deg F): 80                 |  |
| Precipitation:     | None / Light / Moderate / Heavy       | Precip Type: None / Rain / Sleet / Hail / Snow |  |
| Wind:              | Calm / Light / Mod / Strong           | Wind Speed/Direction: NM                       |  |

| Field Measurements |         |         |      |           |             |                      |                  |
|--------------------|---------|---------|------|-----------|-------------|----------------------|------------------|
| Parameter          | Units   | Reading | Time | Flag Code | Instrument  | In-situ or Container | Comments         |
| Water Temp         | deg C   | 10.5    | 1125 |           | YSI Pro     | Container            |                  |
| pH                 | s.u.    | 7.13    |      |           |             |                      |                  |
| Sp. Conductivity   | uS/cm   | 1090    |      |           |             |                      |                  |
| Conductivity       | uS/cm   | 789     |      |           |             |                      |                  |
| DO Saturation      | %       | 48.7    |      |           |             |                      |                  |
| DO                 | mg/L    | 5.42    |      |           |             |                      |                  |
| Baro Press         | mmHg    | 637.6   |      |           |             |                      |                  |
| ORP                | RmV     | 128.0   |      |           |             |                      |                  |
| Turbidity          | NTU     | 0.68    | 1121 | AV        | MicroTRI    | Container            | 0.73, 0.65, 0.66 |
| Discharge          | gal/min | 21      | 1055 | AV        | 5gal bucket |                      |                  |
| H2S                | mg/L    | 0.005   | 1146 | AV        | Colorimeter | Container            |                  |

|                |   |   |
|----------------|---|---|
| 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: 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:

None

Additional information:

H<sub>2</sub>S Hech Kit: Run 1: 0 Run 2: 0

Colorimeter: 0 0.01

- Did not run H<sub>2</sub>S tests for duplicate sample, these results were taken during sampling for SG 31-32-112819

- Calibration info on SG 31-32-CORiver Field Form

| Calibration Information |           |       | Date: |                            | 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

| Project Information      |                       |                      |                    |
|--------------------------|-----------------------|----------------------|--------------------|
| Project:                 | WPX Sampling          | Sample Purpose:      | Subsequent 1 COA 9 |
| Site Name (Well Pad):    | Sq 31-32              | Site API:            | Q                  |
| Station Name:            | VanHoose SESWS337596w | Sample Date:         | 9-16-13            |
| COGCC Facility ID:       | 752692                | Start Time:          | 0923               |
| Field Sample ID:         | Sq 31-32 - CO River   | End Time:            | 1009               |
| Landowner Name:          | Donald + Eva VanHoose | Sample Time:         | 0940               |
| Landowner Address:       | 0875 CR 339           | Sample Team:         | SLG, NWS           |
| Water Right/Well Owner:  | N/A                   | Observer:            | SLG                |
| Water Right/Well Permit: | N/A                   | Lead Signature/Date: | 9-16-13            |

| Station Information               |  |
|-----------------------------------|--|
| Station Description:              | Bank of CO River behind VanHoose house                               |
| Approximate Distance to Well Pad: | 4,950 ft   |
| Station Type:                     | Stream / Spring / Seep / Pond / Lake / NPDES Outfall / Other: River  |
| 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:          | 40' Sampling Location Depth: unknown - able to see                   |
| GPS Location:                     | Zone 12S x 0748127 y 434803 z 48531                                  |

| Weather Conditions |  |
|--------------------|--|
| Sky:               | Clear / Scattered / Cloudy / Overcast Estimated Air Temp (deg F): 70           |
| Precipitation:     | None / Light / Moderate / Heavy Precip Type: None / Rain / Sleet / Hail / Snow |
| Wind:              | Calm / Light / Mod / Strong Wind Speed/Direction: NM                           |

| Field Measurements    |   |                 |      |   |                   |                      |                     |
|-----------------------|---|-----------------|------|---|-------------------|----------------------|---------------------|
| Parameter             | Units   | Reading         | Time | Flag Code                                     | Instrument        | In-situ or Container | Comments            |
| Water Temp            | deg C   | 17.3            | 1005 |   | YSI Pro<br>1A-9AB | In-situ              |                     |
| pH                    | s.u.  | 8.07            |      |   |                   |                      |                     |
| Sp. Conductivity      | uS/cm   | 858             |      |   |                   |                      |                     |
| Conductivity          | uS/cm   | 726             |      |   |                   |                      |                     |
| DO Saturation         | %   | 83.6            |      |   |                   |                      |                     |
| DO                    | mg/L  | 7.96            |      |   |                   |                      |                     |
| Baro Press            | mmHg  | 689.4           |      |   |                   |                      |                     |
| ORP                   | RmV   | 135.1p          |      |   |                   |                      |                     |
| Turbidity             | NTU   | 192.3           | 1009 | AV  | MicroTPI          | Container            |                     |
| Discharge             |   | NM              |      |   |                   |                      | 201.9, 189.2, 185.8 |
| H2S                   | mg/L  | 0.39            | 0936 |   | Colorimeter       | Container            | 2nd = 0.37 @ 0942   |
| H2S                   | mg/L  | 0.00            | 0936 | J   | test kit H2-C     |                      | 2nd = 0.00 @ 0941   |
| 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 |                   |                      |                     |
| → small bubble in 150 |   |                 |      |   |                   |                      |                     |
| 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), 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:

None but may request for sampling to be done more frequently

Additional information:

Sampled about 100 yds upstream of where we sampled for baseline. Water level was higher & in previous spot there was a large eddy

| Calibration Information |           |       | Date: 9-16-13 |                            | Location: Field                |                                |                  |                  |
|-------------------------|-----------|-------|---------------|----------------------------|--------------------------------|--------------------------------|------------------|------------------|
| Instrument              | Parameter | Units | Time          | Calibration Standard Value | Calibration Standard Temp (°C) | Instrument Reading of Standard | Adjusted Reading | Comments         |
| YSI PRO                 | pH        | s.u.  | 0903          | 7.0                        | 19.8                           | 7.089                          |                  | Spotcheck - 6.85 |
| YSI PRO                 | pH        | s.u.  | 0908          | 10.01                      | 19.4                           | 10.03                          |                  |                  |
| YSI PRO                 | pH        | s.u.  | 0910          | 4.01                       | 19.5                           | 4.03                           | 3.83             |                  |
| YSI PRO                 | SpC       | uS/cm | 0840          | 2070                       | 19                             | 2110                           | 2070             |                  |
| YSI PRO                 | SpC       | uS/cm | 0845          | 8974                       | 19.4                           | 8915                           | 8972             |                  |
| YSI PRO                 | DO        | %     | 0923          |                            | 19.1                           | 84.7%                          |                  | 639.6 mmHg       |
|                         | DO        | %     |               |                            |                                |                                |                  |                  |
|                         | ORP       | RmV   |               |                            |                                |                                |                  |                  |
| MICRO TPI               | Turbidity | NTU   | 0900          |                            |                                |                                |                  |                  |

**ATTACHMENT C**

**Data Quality Review Sheets**

## DATA QUALITY REVIEW SHEET

|                  |                 |                    |                    |
|------------------|-----------------|--------------------|--------------------|
| Facility ID:     | 707963          | Project:           | BWQ SG 31-32 Sub 1 |
| Station Name:    | VanHoose Spring | Lab Work Order:    | D50583-1           |
| Sample Date:     | 9/16/2013       | QA/QC Review Date: | 11/13/13           |
| Field Sample ID: | SG 31-32-192819 | Reviewer:          | J. Pahler          |

| 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. Any discrepancies noted on the lab receipt form? <i>If yes, list in the comments section.</i>   | <input type="checkbox"/>            | <input checked="" 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?  | <input type="checkbox"/>            | <input checked="" 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. Lab qualifiers for data (other than non-detect)? <i>List in comments.</i>  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 14. Are corrective actions required? <i>If yes, please 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)      | 0.741            | N/A       | N/A                      | ±5%              | <input checked="" type="checkbox"/> |
| Total Dissolved Solids, mg/L (TDS) | 790              | 706       | 1.12                     | 0.8 – 1.2        | <input checked="" type="checkbox"/> |
| Specific Conductance, µS/cm (SpC)  | 1054             | 956       | 1.10                     | 0.8 – 1.2        | <input checked="" type="checkbox"/> |

**Comments:**

RPD for MS and MSD recoveries of TPH-DRO outside control limits, probable cause due to “sample homogeneity” (RPD 170); “J” qualifier assigned by WWL. Elevated detection limit for nitrogen, nitrite, due to matrix interference. VOA pH > 2 for trip blank and MS, RSK pH > 2 for MS and MSD. Holding time exceeded for pH; WWL qualified with “H” to indicate result is estimated. MS and MSD for benzene qualified by lab with “E” to indicate value exceeded calibration range.

## DATA QUALITY REVIEW SHEET

|                  |                             |                    |                    |
|------------------|-----------------------------|--------------------|--------------------|
| Facility ID:     | 707963                      | Project:           | BWQ SG 31-32 Sub 1 |
| Station Name:    | VanHoose Spring             | Lab Work Order:    | D50583-2           |
| Sample Date:     | 9/16/2013                   | QA/QC Review Date: | 11/13/13           |
| Field Sample ID: | SG 31-32-417214 (Duplicate) | Reviewer:          | J. Pahler          |

| 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. Any discrepancies noted on the lab receipt form? <i>If yes, list in the comments section.</i>   | <input type="checkbox"/>            | <input checked="" 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?  | <input type="checkbox"/>            | <input checked="" 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. Lab qualifiers for data (other than non-detect)? <i>List in comments.</i>  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 14. Are corrective actions required? <i>If yes, please 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)      | 2.162            | N/A       | N/A                      | ±5%              | <input checked="" type="checkbox"/> |
| Total Dissolved Solids, mg/L (TDS) | 788              | 704       | 1.12                     | 0.8 – 1.2        | <input checked="" type="checkbox"/> |
| Specific Conductance, µS/cm (SpC)  | 1051             | 957       | 1.10                     | 0.8 – 1.2        | <input checked="" type="checkbox"/> |

**Comments:**

RPD for MS and MSD recoveries of TPH-DRO outside control limits, probable cause due to “sample homogeneity” (RPD 170); “J” qualifier was assigned by WWL. Elevated detection limit for nitrogen, nitrite, due to matrix interference. VOA pH > 2 for trip blank and MS, RSK pH > 2 for MS and MSD. Holding time exceeded for pH; WWL qualified with “H” to indicate result is estimated. MS and MSD for benzene qualified by lab with “E” to indicate value exceeded calibration range.

## DATA QUALITY REVIEW SHEET

|                  |                          |                    |                    |
|------------------|--------------------------|--------------------|--------------------|
| Facility ID:     | 752692                   | Project:           | BWQ SG 31-32 Sub 1 |
| Station Name:    | VanHoose SESW S33 7S 96W | Lab Work Order:    | D50582-1           |
| Sample Date:     | 9/16/2013                | QA/QC Review Date: | 11/13/13           |
| Field Sample ID: | SG 31-32-CO River        | Reviewer:          | J. Pahler          |

| 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. Any discrepancies noted on the lab receipt form? <i>If yes, list in the comments section.</i>   | <input type="checkbox"/>            | <input checked="" 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?  | <input type="checkbox"/>            | <input checked="" 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. Lab qualifiers for data (other than non-detect)? <i>List in comments.</i>  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 14. Are corrective actions required? <i>If yes, please 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)      | 1.048            | N/A       | N/A                      | ±5%              | <input checked="" type="checkbox"/> |
| Total Dissolved Solids, mg/L (TDS) | 494              | 448       | 1.10                     | 0.8 – 1.2        | <input checked="" type="checkbox"/> |
| Specific Conductance, µS/cm (SpC)  | 669              | 744       | 0.90                     | 0.8 – 1.2        | <input checked="" type="checkbox"/> |

**Comments:**

VOA pH > 2 for MS. RSK pH > 2 for sample, MS, and MSD. RPD for MS and MSD recoveries of TPH-DRO outside of control limits, probable cause due to "sample homogeneity" (RPD 170); "J" qualifier assigned by WWL. Holding time exceeded for pH; WWL qualified with "H" to indicate result is estimated.

**ATTACHMENT D**

**Summary of Analytical Results**

| SG 31-32 BWQ Analytical Results Summary |                 |                     |                      | Baseline               |          |          |      |       |    | Subsequent 1    |          |          |       |      |                              |        |          |          |       |      |    |
|---|-----------------|---------------------|----------------------|------------------------|----------|----------|------|-------|----|-----------------|----------|----------|-------|------|------------------------------|--------|----------|----------|-------|------|----|
| Station Name                            |                 |                     |                      | VanHoose Spring        |          |          |      |       |    | VanHoose Spring |          |          |       |      | VanHoose Spring              |        |          |          |       |      |    |
| Facility ID                             |                 |                     |                      | 707963                 |          |          |      |       |    | 707963          |          |          |       |      | 707963                       |        |          |          |       |      |    |
| Sample Date                             |                 |                     |                      | 6/3/2013               |          |          |      |       |    | 9/16/2013 10:45 |          |          |       |      | 9/16/2013 13:20              |        |          |          |       |      |    |
| Field Sample ID                         |                 |                     |                      | SG 31-32-192819        |          |          |      |       |    | SG 31-32-192819 |          |          |       |      | SG 31-32-417214 <sup>a</sup> |        |          |          |       |      |    |
| Analytical Lab                          |                 |                     |                      | ALS Laboratories (ALS) |          |          |      |       |    | Accutest (AMS)  |          |          |       |      | Accutest (AMS)               |        |          |          |       |      |    |
| Lab Sample ID                           |                 |                     |                      | 1306024-2              |          |          |      |       |    | D50583-1        |          |          |       |      | D50583-2                     |        |          |          |       |      |    |
|   | 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 |
| <b>Inorganics</b>                       |                 |                     |                      |                        |          |          |      |       |    |                 |          |          |       |      |                              |        |          |          |       |      |    |
| Alkalinity AS CaCO3, Total              | mg/l            | SM2320B             | SM 2320B-2011        | 370                    |          |          | 20   |       | 1  | 340             |          |          | 5     |      | 1                            | 337    |          |          | 5     |      | 1  |
| Alkalinity, Bicarbonate as CaCO3        | mg/l            | SM2320B             | SM 2320B-2011        | 370                    |          |          | 20   |       | 1  | 340             |          |          | 5     |      | 1                            | 337    |          |          | 5     |      | 1  |
| Alkalinity, Carbonate as CaCO3          | mg/l            | SM2320B             | SM 2320B-2011        | 20                     | U        |          | 20   | 0.3   | 1  | 5               | U        |          | 5     |      | 1                            | 5      | U        |          | 5     |      | 1  |
| Bromide                                 | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 1                      | U        |          | 1    | 0.3   | 5  | 0.12            |          |          | 0.1   |      | 2                            | 0.13   |          |          | 0.1   |      | 2  |
| Chloride                                | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 14                     |          |          | 1    |       | 5  | 12.2            |          |          | 1     |      | 2                            | 12.1   |          |          | 1     |      | 2  |
| Fluoride                                | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 0.6                    |          |          | 0.5  | 0.15  | 5  | 0.3             |          |          | 0.2   |      | 2                            | 0.33   |          |          | 0.2   |      | 2  |
| Nitrate as N                            | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 1.4                    |          |          | 1    | 0.3   | 5  | 0.92            |          |          | 0.02  |      | 2                            | 0.91   |          |          | 0.02  |      | 2  |
| Nitrite as N                            | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 0.5                    | U        |          | 0.5  | 0.15  | 5  | 0.008           | U        |          | 0.008 |      | 2                            | 0.008  | U        |          | 0.008 |      | 2  |
| pH                                      | s.u.            | SM4500-H            | SM4500HB+ 2011/9040C | 7.64                   |          |          | 0.1  |       | 1  | 7.73            |          | H        |       |      | 1                            | 7.75   |          | H        |       |      | 1  |
| Specific Conductivity                   | umhos/cm        | SM2510B             | SM 2510B-2011        | 1030                   |          |          | 1    |       | 1  | 956             |          |          | 1     |      | 1                            | 957    |          |          | 1     |      | 1  |
| Sulfate                                 | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 200                    |          |          | 5    | 1.5   | 5  | 217             |          |          | 10    |      | 20                           | 213    |          |          | 10    |      | 20 |
| Total Dissolved Solids                  | mg/l            | SM2540C             | SM 2540C-2011        | 710                    |          |          | 20   |       | 1  | 706             |          |          | 10    |      | 1                            | 704    |          |          | 10    |      | 1  |
| Total Phosphorous                       | mg/l            | EPA365.2            | HACH8190/SM4500P-B/E | 0.05                   | U        |          | 0.05 | 0.015 | 1  | 0.034           |          |          | 0.01  |      | 1                            | 0.037  |          |          | 0.01  |      | 1  |
| <b>Dissolved Metals</b>                 |                 |                     |                      |                        |          |          |      |       |    |                 |          |          |       |      |                              |        |          |          |       |      |    |
| Barium                                  | ug/l            | EPA200.8            | EPA 200.7            | 27                     |          |          | 1    | 0.3   | 10 | 32              |          |          | 10    | 1.4  | 1                            | 33.3   |          |          | 10    | 1.4  | 1  |
| Boron                                   | ug/l            | EPA200.8            | EPA 200.7            | 190                    |          |          | 50   | 15    | 10 | 192             |          |          | 50    | 6.6  | 1                            | 187    |          |          | 50    | 6.6  | 1  |
| Calcium                                 | ug/l            | EPA200.8            | EPA 200.7            | 69000                  |          |          | 1000 | 65    | 10 | 69200           |          |          | 400   | 66   | 1                            | 70400  |          |          | 400   | 66   | 1  |
| Iron (Ferric)                           | ug/l            | EPA200.8            | EPA 200.7            | 100                    | U        |          | 100  | 30    | 10 | 10              | U        |          | 10    | 3.2  | 1                            | 10     | U        |          | 10    | 3.2  | 1  |
| Magnesium                               | ug/l            | EPA200.8            | EPA 200.7            | 45000                  |          |          | 100  | 30    | 10 | 50000           |          |          | 200   | 29   | 1                            | 49500  |          |          | 200   | 29   | 1  |
| Manganese                               | ug/l            | EPA200.8            | EPA 200.7            | 2                      | U        |          | 2    | 0.6   | 10 | 5               | U        |          | 5     | 0.29 | 1                            | 5      | U        |          | 5     | 0.29 | 1  |
| Potassium                               | ug/l            | EPA200.8            | EPA 200.7            | 3200                   |          |          | 1000 | 300   | 10 | 3880            |          |          | 1000  | 230  | 1                            | 3950   |          |          | 1000  | 230  | 1  |
| Selenium                                | ug/l            | EPA200.8            | EPA 200.8            | 2.8                    |          |          | 1    | 0.5   | 10 | 3.3             |          |          | 0.8   | 0.42 | 2                            | 3.3    |          |          | 0.8   | 0.42 | 2  |
| Sodium                                  | ug/l            | EPA200.8            | EPA 200.7            | 98000                  |          |          | 1000 | 300   | 10 | 96100           |          |          | 400   | 36   | 1                            | 100000 |          |          | 400   | 36   | 1  |
| Strontium                               | ug/l            | EPA200.8            | EPA 200.7            | 720                    |          |          | 1    | 0.3   | 10 | 821             |          |          | 5     | 0.12 | 1                            | 865    |          |          | 5     | 0.12 | 1  |
| <b>Organics</b>                         |                 |                     |                      |                        |          |          |      |       |    |                 |          |          |       |      |                              |        |          |          |       |      |    |
| Diesel Range Organics                   | mg/l            | SW8015M             | SW846-8015B          | 0.5                    | U        |          | 0.5  | 0.15  | 1  | 1.3             |          | J        | 0.19  | 0.17 | 1                            | 0.19   | U        | J        | 0.19  | 0.17 | 1  |
| Gasoline Range Organics                 | ug/l            | SW8260_25           | SW846 8260B          | 100                    | U        |          | 100  |       | 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           | 1                      | U        |          | 1    | 1     | 1  | 0.8             | U        |          | 0.8   | 0.4  | 1                            | 0.8    | U        |          | 0.8   | 0.4  | 1  |
| Propane                                 | ug/l            | RSK175              | RSK175 MOD           | 1                      | U        |          | 1    | 1     | 1  | 22              | U        |          | 22    | 11   | 1                            | 22     | U        |          | 22    | 11   | 1  |

| SG 31-32 BWQ Analytical Results Summary |       |           |                | Baseline               |   |   |   |     | Subsequent 1    |       |   |  |     |                              |   |       |   |  |     |      |   |
|---|-------|-----------|----------------|------------------------|---|---|---|-----|-----------------|-------|---|--|-----|------------------------------|---|-------|---|--|-----|------|---|
| Station Name                            |       |           |                | VanHoose Spring        |   |   |   |     | VanHoose Spring |       |   |  |     | VanHoose Spring              |   |       |   |  |     |      |   |
| Facility ID                             |       |           |                | 707963                 |   |   |   |     | 707963          |       |   |  |     | 707963                       |   |       |   |  |     |      |   |
| Sample Date                             |       |           |                | 6/3/2013               |   |   |   |     | 9/16/2013 10:45 |       |   |  |     | 9/16/2013 13:20              |   |       |   |  |     |      |   |
| Field Sample ID                         |       |           |                | SG 31-32-192819        |   |   |   |     | SG 31-32-192819 |       |   |  |     | SG 31-32-417214 <sup>3</sup> |   |       |   |  |     |      |   |
| Analytical Lab                          |       |           |                | ALS Laboratories (ALS) |   |   |   |     | Accutest (AMS)  |       |   |  |     | Accutest (AMS)               |   |       |   |  |     |      |   |
| Lab Sample ID                           |       |           |                | 1306024-2              |   |   |   |     | D50583-1        |       |   |  |     | D50583-2                     |   |       |   |  |     |      |   |
| VOAs                                    |       |           |                |                        |   |   |   |     |                 |       |   |  |     |                              |   |       |   |  |     |      |   |
| 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 |                | 1                      | U |   | 1 | 0.3 | 1               | NM    |   |  |     |                              |   | NM    |   |  |     |      |   |
| o-Xylene                                | ug/l  | SW8260_25 |                | 1                      | U |   | 1 | 0.3 | 1               | NM    |   |  |     |                              |   | NM    |   |  |     |      |   |
| Xylenes (Total)                         | ug/l  |           | SW846 8260B    | NM                     |   |   |   |     |                 | 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 |
| Bacteria <sup>2,3</sup>                 |       |           |                |                        |   |   |   |     |                 |       |   |  |     |                              |   |       |   |  |     |      |   |
| Iron Related Bacteria                   | nu    | BART      | HACH IRB-BART  | 1                      |   |   |   |     | 1               | 1     |   |  | 25  |                              | 1 | 0     | U |  | 25  |      | 1 |
| Slime Forming Bacteria                  | nu    | BART      | HACH SLYM-BART | 1                      |   |   |   |     | 1               | 1     |   |  | 500 |                              | 1 | 1     |   |  | 500 |      | 1 |
| Sulfate Reducing Bacteria               | nu    | BART      | HACH SRB-BART  | 0                      | U |   |   |     | 1               | 1     |   |  | 200 |                              | 1 | 1     |   |  | 200 |      | 1 |
| Field Parameters                        |       |           |                |                        |   |   |   |     |                 |       |   |  |     |                              |   |       |   |  |     |      |   |
| Bubbles                                 | nu    | Field     | Field          | NM                     |   |   |   |     | 1               | None  |   |  |     |                              | 1 | None  |   |  |     |      | 1 |
| Color                                   | nu    | Field     | Field          | Clear                  |   |   |   |     | 1               | Clear |   |  |     |                              | 1 | Clear |   |  |     |      | 1 |
| Conductivity, Field                     | uS/cm | Field     | Field          | 771                    |   |   |   |     | 1               | 794   |   |  |     |                              | 1 | 789   |   |  |     |      | 1 |
| Discharge, measured                     | gpm   | Field     | Field          | 60                     |   | J |   |     | 1               | 21    |   |  |     |                              | 1 | 21    |   |  |     |      | 1 |
| Dissolved Oxygen, Field                 | mg/l  | Field     | Field          | 6.84                   |   |   |   |     | 1               | 5.87  |   |  |     |                              | 1 | 5.42  |   |  |     |      | 1 |
| Dissolved Oxygen, Field,%               | %     | Field     | Field          | 61.5                   |   |   |   |     | 1               | 52.1  |   |  |     |                              | 1 | 48.7  |   |  |     |      | 1 |
| Effervescence                           | nu    | Field     | Field          | NM                     |   |   |   |     | 1               | None  |   |  |     |                              | 1 | None  |   |  |     |      | 1 |
| H2S, Field                              | mg/l  | HACH      | HACH           | 0.01                   |   |   |   |     | 1               | 0.005 |   |  |     |                              | 1 | 0.005 |   |  |     |      | 1 |
| Odor                                    | nu    | Field     | Field          | None                   |   |   |   |     | 1               | None  |   |  |     |                              | 1 | None  |   |  |     |      | 1 |
| ORP, field                              | mv    | Field     | Field          | 164.9                  |   |   |   |     | 1               | 121.6 |   |  |     |                              | 1 | 128   |   |  |     |      | 1 |
| pH, Field                               | s.u.  | Field     | Field          | 7.36                   |   |   |   |     | 1               | 7.22  |   |  |     |                              | 1 | 7.13  |   |  |     |      | 1 |
| Specific Conductivity, Field            | uS/cm | Field     | Field          | 1066                   |   |   |   |     | 1               | 1098  |   |  |     |                              | 1 | 1090  |   |  |     |      | 1 |
| Temperature, Water                      | Deg C | Field     | Field          | 10.4                   |   |   |   |     | 1               | 10.5  |   |  |     |                              | 1 | 10.5  |   |  |     |      | 1 |
| Turbidity, field                        | NTUs  | Field     | Field          | 0.07                   |   |   |   |     | 1               | 0.5   |   |  |     |                              | 1 | 0.68  |   |  |     |      | 1 |
| Sediment                                | nu    | Field     | Field          | NM                     |   |   |   |     | 1               | None  |   |  |     |                              | 1 | None  |   |  |     |      | 1 |
| VOA Headspace                           | nu    | Field     | Field          | Nm                     |   |   |   |     | 1               | None  |   |  |     |                              | 1 | None  |   |  |     |      | 1 |

Notes:

<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)

<sup>3</sup> Field duplicate

U = not detected at the reporting limit

NM = not measured

J = estimated value; lab QA indicates poor precision

NA = not applicable

H = hold time exceeded; value estimated

| SG 31-32 BWQ Analytical Results Summary |                 |                     |                      | Baseline                 |          |          |      |       |    | Subsequent 1             |          |          |       |      |    |
|---|-----------------|---------------------|----------------------|--------------------------|----------|----------|------|-------|----|--------------------------|----------|----------|-------|------|----|
| Station Name                            |                 |                     |                      | VanHoose SESW S33 7S 96W |          |          |      |       |    | VanHoose SESW S33 7S 96W |          |          |       |      |    |
| Facility ID                             |                 |                     |                      | 752692                   |          |          |      |       |    | 752692                   |          |          |       |      |    |
| Sample Date                             |                 |                     |                      | 6/3/2013                 |          |          |      |       |    | 9/16/2013 9:46           |          |          |       |      |    |
| Field Sample ID                         |                 |                     |                      | SG 31-32-CO River        |          |          |      |       |    | SG 31-32-CO River        |          |          |       |      |    |
| Analytical Lab                          |                 |                     |                      | ALS Laboratories (ALS)   |          |          |      |       |    | Accutest (AMS)           |          |          |       |      |    |
| Lab Sample ID                           |                 |                     |                      | 1306024-1                |          |          |      |       |    | D50582-1                 |          |          |       |      |    |
|   | 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        | 100                      |          |          | 5    |       | 1  | 113                      |          |          | 5     |      | 1  |
| Alkalinity, Bicarbonate as CaCO3        | mg/l            | SM2320B             | SM 2320B-2011        | 100                      |          |          | 5    |       | 1  | 113                      |          |          | 5     |      | 1  |
| Alkalinity, Carbonate as CaCO3          | mg/l            | SM2320B             | SM 2320B-2011        | 5                        | U        |          | 5    | 0.3   | 1  | 5                        | U        |          | 5     |      | 1  |
| Bromide                                 | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 1                        | U        |          | 1    | 0.3   | 5  | 0.05                     | U        |          | 0.05  |      | 1  |
| Chloride                                | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 68                       |          |          | 1    |       | 5  | 120                      |          |          | 5     |      | 10 |
| Fluoride                                | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 0.5                      | U        |          | 0.5  | 0.15  | 5  | 0.25                     |          |          | 0.1   |      | 1  |
| Nitrate as N                            | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 1                        | U        |          | 1    | 0.3   | 5  | 0.19                     |          |          | 0.01  |      | 1  |
| Nitrite as N                            | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 0.5                      | U        |          | 0.5  | 0.15  | 5  | 0.004                    | U        |          | 0.004 |      | 1  |
| pH                                      | s.u.            | SM4500-H            | SM4500HB+2011/9040C  | 8.16                     |          |          | 0.1  |       | 1  | 8.18                     |          | H        |       |      | 1  |
| Specific Conductivity                   | umhos/cm        | SM2510B             | SM 2510B-2011        | 484                      |          |          | 1    |       | 1  | 744                      |          |          | 1     |      | 1  |
| Sulfate                                 | mg/l            | EPA300.0            | EPA 300.0/SW846 9056 | 52                       |          |          | 5    | 1.5   | 5  | 103                      |          |          | 5     |      | 10 |
| Total Dissolved Solids                  | mg/l            | SM2540C             | SM 2540C-2011        | 320                      |          |          | 20   |       | 1  | 448                      |          |          | 10    |      | 1  |
| Total Phosphorous                       | mg/l            | EPA365.2            | HACH8190/SM4500P-B/E | 0.12                     |          |          | 0.05 | 0.015 | 1  | 1.4                      |          |          | 0.05  |      | 5  |
| <b>Dissolved Metals</b>                 |                 |                     |                      |                          |          |          |      |       |    |                          |          |          |       |      |    |
| Barium                                  | ug/l            | EPA200.8            | EPA 200.7            | 43                       |          |          | 1    | 0.3   | 10 | 62.5                     |          |          | 10    |      | 1  |
| Boron                                   | ug/l            | EPA200.8            | EPA 200.7            | 50                       | U        |          | 50   | 15    | 10 | 50                       | U        |          | 50    |      | 1  |
| Calcium                                 | ug/l            | EPA200.8            | EPA 200.7            | 43000                    |          |          | 1000 | 65    | 10 | 59600                    |          |          | 400   |      | 1  |
| Iron (Ferric)                           | ug/l            | EPA200.8            | EPA 200.7            | 100                      | U        |          | 100  | 30    | 10 | 25.4                     |          |          | 10    |      | 1  |
| Magnesium                               | ug/l            | EPA200.8            | EPA 200.7            | 8500                     |          |          | 100  | 30    | 10 | 11900                    |          |          | 200   |      | 1  |
| Manganese                               | ug/l            | EPA200.8            | EPA 200.7            | 13                       |          |          | 2    | 0.6   | 10 | 5                        | U        |          | 5     |      | 1  |
| Potassium                               | ug/l            | EPA200.8            | EPA 200.7            | 1600                     |          |          | 1000 | 300   | 10 | 3420                     |          |          | 1000  |      | 1  |
| Selenium                                | ug/l            | EPA200.8            | EPA 200.8            | 1                        | U        |          | 1    | 0.5   | 10 | 0.8                      | U        |          | 0.8   |      | 2  |
| Sodium                                  | ug/l            | EPA200.8            | EPA 200.7            | 49000                    |          |          | 1000 | 300   | 10 | 82400                    |          |          | 400   |      | 1  |
| Strontium                               | ug/l            | EPA200.8            | EPA 200.7            | 300                      |          |          | 1    | 0.3   | 10 | 549                      |          |          | 5     |      | 1  |
| <b>Organics</b>                         |                 |                     |                      |                          |          |          |      |       |    |                          |          |          |       |      |    |
| Diesel Range Organics                   | mg/l            | SW8015M             | SW846-8015B          | 0.5                      | U        |          | 0.5  | 0.15  | 1  | 0.19                     | U        | J        | 0.19  | 0.17 | 1  |
| Gasoline Range Organics                 | ug/l            | SW8260_25           | SW846 8260B          | 100                      | U        |          | 100  |       | 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           | 1.1                      |          |          | 1    | 1     | 1  | 1.7                      |          |          | 0.8   | 0.4  | 1  |
| Propane                                 | ug/l            | RSK175              | RSK175 MOD           | 1                        | U        |          | 1    | 1     | 1  | 22                       | U        |          | 22    | 11   | 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           |                      | 1                        | U        |          | 1    | 0.3   | 1  | NM                       |          |          |       |      |    |
| o-Xylene                                | ug/l            | SW8260_25           |                      | 1                        | U        |          | 1    | 0.3   | 1  | NM                       |          |          |       |      |    |
| Xylenes (Total)                         | ug/l            |                     | 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  |
| <b>Bacteria <sup>2,3</sup></b>          |                 |                     |                      |                          |          |          |      |       |    |                          |          |          |       |      |    |
| Iron Related Bacteria                   | nu              | BART                | HACH IRB-BART        | 1                        |          |          |      |       | 1  | 1                        |          |          | 25    |      | 1  |
| Slime Forming Bacteria                  | nu              | BART                | HACH SLYM-BART       | 1                        |          |          |      |       | 1  | 1                        |          |          | 500   |      | 1  |
| Sulfate Reducing Bacteria               | nu              | BART                | HACH SRB-BART        | 1                        |          |          |      |       | 1  | 0                        | U        |          | 200   |      | 1  |

| SG 31-32 BWQ Analytical Results Summary |                 |                     |                     | Baseline                 |          |          |    |     |    | Subsequent 1             |          |          |    |     |    |
|---|-----------------|---------------------|---------------------|--------------------------|----------|----------|----|-----|----|--------------------------|----------|----------|----|-----|----|
| Station Name                            |                 |                     |                     | VanHoose SESW S33 7S 96W |          |          |    |     |    | VanHoose SESW S33 7S 96W |          |          |    |     |    |
| Facility ID                             |                 |                     |                     | 752692                   |          |          |    |     |    | 752692                   |          |          |    |     |    |
| Sample Date                             |                 |                     |                     | 6/3/2013                 |          |          |    |     |    | 9/16/2013 9:46           |          |          |    |     |    |
| Field Sample ID                         |                 |                     |                     | SG 31-32-CO River        |          |          |    |     |    | SG 31-32-CO River        |          |          |    |     |    |
| Analytical Lab                          |                 |                     |                     | ALS Laboratories (ALS)   |          |          |    |     |    | Accutest (AMS)           |          |          |    |     |    |
| Lab Sample ID                           |                 |                     |                     | 1306024-1                |          |          |    |     |    | D50582-1                 |          |          |    |     |    |
|   | 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>Field Parameters</b>                 |                 |                     |                     |                          |          |          |    |     |    |                          |          |          |    |     |    |
| Bubbles                                 | nu              | Field               | Field               | NM                       |          |          |    |     |    | None                     |          |          |    |     | 1  |
| Color                                   | nu              | Field               | Field               | Clear                    |          |          |    |     |    | M. Brown                 |          |          |    |     | 1  |
| Conductivity, Field                     | uS/cm           | Field               | Field               | 425.7                    |          |          |    |     |    | 726                      |          |          |    |     | 1  |
| Discharge, measured                     | gpm             | Field               | Field               | NM                       |          |          |    |     |    | NM                       |          |          |    |     | 1  |
| Dissolved Oxygen, Field                 | mg/l            | Field               | Field               | 8.68                     |          |          |    |     |    | 7.96                     |          |          |    |     | 1  |
| Dissolved Oxygen, Field,%               | %               | Field               | Field               | 87                       |          |          |    |     |    | 83.6                     |          |          |    |     | 1  |
| Effervescence                           | nu              | Field               | Field               | NM                       |          |          |    |     |    | None                     |          |          |    |     | 1  |
| H2S, Field                              | mg/l            | Field               | HACH                | 0.05                     |          |          |    |     |    | 0.39                     |          |          |    |     | 1  |
| Odor                                    | nu              | Field               | Field               | None                     |          |          |    |     |    | None                     |          |          |    |     | 1  |
| ORP, field                              | mv              | Field               | Field               | 156.7                    |          |          |    |     |    | 135.6                    |          |          |    |     | 1  |
| pH, Field                               | s.u.            | Field               | Field               | 8.13                     |          |          |    |     |    | 8.07                     |          |          |    |     | 1  |
| Specific Conductivity, Field            | uS/cm           | Field               | Field               | 522.3                    |          |          |    |     |    | 850                      |          |          |    |     | 1  |
| Temperature, Water                      | Deg C           | Field               | Field               | 10.4                     |          |          |    |     |    | 17.3                     |          |          |    |     | 1  |
| Turbidity, field                        | NTUs            | Field               | Field               | 28.46                    |          |          |    |     |    | 192.3                    |          | AV       |    |     | 1  |
| Sediment                                | nu              | Field               | Field               | NM                       |          |          |    |     |    | Heavy                    |          |          |    |     | 1  |
| VOA Headspace                           | nu              | Field               | Field               | NM                       |          |          |    |     |    | None                     |          |          |    |     | 1  |

Notes:

<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

**ATTACHMENT E**

**Laboratory Analytical Summary Report**

**Technical Report for**

**WPX Energy Rocky Mountain, LLC**

**WWLCOGJ: WPX SG 31-32**

**Accutest Job Number: D50583**

**Sampling Date: 09/16/13**

**Report to:**

**Western Water and Land, Inc.**  
**743 Horizon Court Suite 330**  
**Grand Junction, CO 81506**  
**bsmith@westernwaterandland.com; jpahler@westernwaterandland.com**  
**ATTN: Bruce Smith**

**Total number of pages in report: 64**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference 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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### Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D50583

WWLCOGJ: WPX SG 31-32

| Sample Number | Collected |          | Received | Matrix |                      | Client Sample ID |
|---------------|-----------|----------|----------|--------|----------------------|------------------|
|               | Date      | Time By  |          | Code   | Type                 |                  |
| D50583-1      | 09/16/13  | 10:45 NS | 09/17/13 | AQ     | Surface Water        | SG 31-32-192819  |
| D50583-1B     | 09/16/13  | 10:45 NS | 09/17/13 | AQ     | Surface Water        | SG 31-32-192819  |
| D50583-1F     | 09/16/13  | 10:45 NS | 09/17/13 | AQ     | Surface H2O Filtered | SG 31-32-192819  |
| D50583-2      | 09/16/13  | 13:20 NS | 09/17/13 | AQ     | Surface Water        | SG 31-32-417214  |
| D50583-2B     | 09/16/13  | 13:20 NS | 09/17/13 | AQ     | Surface Water        | SG 31-32-417214  |
| D50583-2F     | 09/16/13  | 13:20 NS | 09/17/13 | AQ     | Surface H2O Filtered | SG 31-32-417214  |
| D50583-3      | 09/16/13  | 00:00 NS | 09/17/13 | AQ     | Trip Blank Water     | TRIP BLANK       |



## CASE NARRATIVE / CONFORMANCE SUMMARY

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

**Job No** D50583

**Site:** WWLCOGJ: WPX SG 31-32

**Report Date** 10/1/2013 10:38:37 AM

On 09/17/2013, 2 sample(s), 1 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.5 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D50583 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:** V6V1161

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50589-4DUP, D50598-2MS were used as the QC samples indicated.

**Matrix** AQ **Batch ID:** V7V1254

- All samples were analyzed within the recommended method holding time.
- Sample(s) D50581-1DUP, D48569-7MS were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D48569-7MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D48569-7MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D50583-3: 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:** GFB414

- All samples were analyzed within the recommended method holding time.
- Sample(s) D50582-1MS, D50582-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D50582-1MS: Sample pH >2 at time of analysis.
- D50582-1MSD: Sample pH >2 at time of analysis.

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

**Matrix** AQ **Batch ID:** OP8591

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D48569-3MS, D48569-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The RPD(s) for the MS and MSD recoveries of TPH-DRO (C10-C28) are outside control limits for sample OP8591-MSD. Probable cause due to sample homogeneity.

### Metals By Method EPA 200.7

|                  |                          |
|------------------|--------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> MP11112 |
|------------------|--------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50583-1FMS, D50583-1FMSD were used as the QC samples for the metals analysis.

### Metals By Method EPA 200.8

|                  |                          |
|------------------|--------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> MP11116 |
|------------------|--------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- .
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50583-2FMS, D50583-2FMSD 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> GP10946 |
|------------------|--------------------------|

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50578-2MS, D50578-2MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- D50583-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.
- D50583-2 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.

### Wet Chemistry By Method HACH IRB-BART

|                  |                        |
|------------------|------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> MB251 |
|------------------|------------------------|

- 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> MB252 |
|------------------|------------------------|

- 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> MB253 |
|------------------|------------------------|

- 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> GP11000 |
|------------------|--------------------------|

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50441-1DUP, D50441-1MS, D50441-1MSD were used as the QC samples for the Phosphorus, Total analysis.

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

|                  |                          |
|------------------|--------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> GN21995 |
|------------------|--------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50545-1DUP, D50545-1MS, D50545-1MSD were used as the QC samples for the Alkalinity, Total as CaCO<sub>3</sub> analysis.

|                  |                          |
|------------------|--------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> GN21996 |
|------------------|--------------------------|

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

|                  |                          |
|------------------|--------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> GN21997 |
|------------------|--------------------------|

- 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

|                  |                          |
|------------------|--------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> GP10973 |
|------------------|--------------------------|

- Sample(s) D50582-1DUP 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> GN21944 |
|------------------|--------------------------|

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50439-1DUP 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> GN21969 |
|------------------|--------------------------|

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D50583-1, D50583-2

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

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

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

## Summary of Hits

**Job Number:** D50583  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32  
**Collected:** 09/16/13



| Lab Sample ID                    | Client Sample ID       | Result/<br>Qual | RL    | MDL  | Units    | Method                |
|----------------------------------|------------------------|-----------------|-------|------|----------|-----------------------|
| <b>D50583-1</b>                  | <b>SG 31-32-192819</b> |                 |       |      |          |                       |
| TPH-DRO (C10-C28)                |                        | 1.30            | 0.19  | 0.17 | mg/l     | SW846-8015B           |
| Alkalinity, Bicarbonate as CaCO3 |                        | 340             | 5.0   |      | mg/l     | SM 2320B-2011         |
| Alkalinity, Total as CaCO3       |                        | 340             | 5.0   |      | mg/l     | SM 2320B-2011         |
| Bromide                          |                        | 0.12            | 0.10  |      | mg/l     | EPA 300.0/SW846 9056  |
| Chloride                         |                        | 12.2            | 1.0   |      | mg/l     | EPA 300.0/SW846 9056  |
| Fluoride                         |                        | 0.30            | 0.20  |      | mg/l     | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrate                |                        | 0.92            | 0.020 |      | mg/l     | EPA 300.0/SW846 9056  |
| Phosphorus, Total                |                        | 0.034           | 0.010 |      | mg/l     | HACH8190/SM4500P-B/E  |
| Solids, Total Dissolved          |                        | 706             | 10    |      | mg/l     | SM 2540C-2011         |
| Specific Conductivity            |                        | 956             | 1.0   |      | umhos/cm | SM 2510B-2011         |
| Sulfate                          |                        | 217             | 10    |      | mg/l     | EPA 300.0/SW846 9056  |
| pH                               |                        | 7.73            |       |      | su       | SM4500HB+ -2011/9040C |
| <b>D50583-1B</b>                 | <b>SG 31-32-192819</b> |                 |       |      |          |                       |
| Iron Reducing Bacteria           |                        | 2300            | 25    |      | CFU/ml   | HACH IRB-BART         |
| Slime Forming Bacteria           |                        | 66500           | 500   |      | CFU/ml   | HACH SLYM-BART        |
| Sulfate Reducing Bacteria        |                        | 5000            | 200   |      | CFU/ml   | HACH SRB-BART         |
| <b>D50583-1F</b>                 | <b>SG 31-32-192819</b> |                 |       |      |          |                       |
| Barium                           |                        | 32.0            | 10    |      | ug/l     | EPA 200.7             |
| Boron                            |                        | 192             | 50    |      | ug/l     | EPA 200.7             |
| Calcium                          |                        | 69200           | 400   |      | ug/l     | EPA 200.7             |
| Magnesium                        |                        | 50000           | 200   |      | ug/l     | EPA 200.7             |
| Potassium                        |                        | 3880            | 1000  |      | ug/l     | EPA 200.7             |
| Selenium                         |                        | 3.3             | 0.80  |      | ug/l     | EPA 200.8             |
| Sodium                           |                        | 96100           | 400   |      | ug/l     | EPA 200.7             |
| Strontium                        |                        | 821             | 5.0   |      | ug/l     | EPA 200.7             |
| <b>D50583-2</b>                  | <b>SG 31-32-417214</b> |                 |       |      |          |                       |
| Alkalinity, Bicarbonate as CaCO3 |                        | 337             | 5.0   |      | mg/l     | SM 2320B-2011         |
| Alkalinity, Total as CaCO3       |                        | 337             | 5.0   |      | mg/l     | SM 2320B-2011         |
| Bromide                          |                        | 0.13            | 0.10  |      | mg/l     | EPA 300.0/SW846 9056  |
| Chloride                         |                        | 12.1            | 1.0   |      | mg/l     | EPA 300.0/SW846 9056  |
| Fluoride                         |                        | 0.33            | 0.20  |      | mg/l     | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrate                |                        | 0.91            | 0.020 |      | mg/l     | EPA 300.0/SW846 9056  |
| Phosphorus, Total                |                        | 0.037           | 0.010 |      | mg/l     | HACH8190/SM4500P-B/E  |
| Solids, Total Dissolved          |                        | 704             | 10    |      | mg/l     | SM 2540C-2011         |
| Specific Conductivity            |                        | 957             | 1.0   |      | umhos/cm | SM 2510B-2011         |
| Sulfate                          |                        | 213             | 10    |      | mg/l     | EPA 300.0/SW846 9056  |
| pH                               |                        | 7.75            |       |      | su       | SM4500HB+ -2011/9040C |

## Summary of Hits

**Job Number:** D50583  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32  
**Collected:** 09/16/13



| Lab Sample ID | Client Sample ID | Result/<br>Qual | RL | MDL | Units | Method |
|---------------|------------------|-----------------|----|-----|-------|--------|
|---------------|------------------|-----------------|----|-----|-------|--------|

**D50583-2B      SG 31-32-417214**

|                           |       |     |  |  |        |                |
|---------------------------|-------|-----|--|--|--------|----------------|
| Slime Forming Bacteria    | 66500 | 500 |  |  | CFU/ml | HACH SLYM-BART |
| Sulfate Reducing Bacteria | 5000  | 200 |  |  | CFU/ml | HACH SRB-BART  |

**D50583-2F      SG 31-32-417214**

|           |        |      |  |  |      |           |
|-----------|--------|------|--|--|------|-----------|
| Barium    | 33.3   | 10   |  |  | ug/l | EPA 200.7 |
| Boron     | 187    | 50   |  |  | ug/l | EPA 200.7 |
| Calcium   | 70400  | 400  |  |  | ug/l | EPA 200.7 |
| Magnesium | 49500  | 200  |  |  | ug/l | EPA 200.7 |
| Potassium | 3950   | 1000 |  |  | ug/l | EPA 200.7 |
| Selenium  | 3.3    | 0.80 |  |  | ug/l | EPA 200.8 |
| Sodium    | 100000 | 400  |  |  | ug/l | EPA 200.7 |
| Strontium | 865    | 5.0  |  |  | ug/l | EPA 200.7 |

**D50583-3      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> SG 31-32-192819 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-1           | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846 8260B               |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

| Run #  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 6V20955.D | 1  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |
| 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  | 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> SG 31-32-192819 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-1           | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> RSK175 MOD                |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

| Run #  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FB09431.D | 1  | 09/18/13 | JS | n/a       | n/a        | GFB414           |
| Run #2 |           |    |          |    |           |            |                  |

| Run #  | Initial Volume | Headspace Volume | Volume Injected | Temperature |
|--------|----------------|------------------|-----------------|-------------|
| Run #1 | 39.0 ml        | 4.0 ml           | 500 ul          | 23.0 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     | 0.022   | 0.011   | mg/l  |   |

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit

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> SG 31-32-192819 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-1           | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846-8015B SW846 3510C   |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

| Run #  | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------|----|-----------|------------|------------------|
| Run #1 | FH013168.D | 1  | 09/19/13 | TU | 09/18/13  | OP8591     | GFH700           |
| 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)    | 1.30   | 0.19   | 0.17    | mg/l  |   |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |       |   |
| 84-15-1 | o-Terphenyl          | 51%    |        | 20-140% |       |   |

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> SG 31-32-192819 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-1           | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

## General Chemistry

| Analyte                                | Result   | RL     | Units    | DF | Analyzed       | By | Method                |
|--|----------|--------|----------|----|----------------|----|-----------------------|
| Alkalinity, Bicarbonate as CaC         | 340      | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Alkalinity, Carbonate                  | < 5.0    | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Alkalinity, Total as CaCO <sub>3</sub> | 340      | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Bromide                                | 0.12     | 0.10   | mg/l     | 2  | 09/17/13 15:33 | SK | EPA 300.0/SW846 9056  |
| Chloride                               | 12.2     | 1.0    | mg/l     | 2  | 09/17/13 15:33 | SK | EPA 300.0/SW846 9056  |
| Fluoride                               | 0.30     | 0.20   | mg/l     | 2  | 09/17/13 15:33 | SK | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrate                      | 0.92     | 0.020  | mg/l     | 2  | 09/17/13 15:33 | SK | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrite <sup>a</sup>         | < 0.0080 | 0.0080 | mg/l     | 2  | 09/17/13 15:33 | SK | EPA 300.0/SW846 9056  |
| Phosphorus, Total                      | 0.034    | 0.010  | mg/l     | 1  | 09/24/13       | BF | HACH8190/SM4500P-B/E  |
| Solids, Total Dissolved                | 706      | 10     | mg/l     | 1  | 09/18/13       | RW | SM 2540C-2011         |
| Specific Conductivity                  | 956      | 1.0    | umhos/cm | 1  | 09/20/13       | RW | SM 2510B-2011         |
| Sulfate                                | 217      | 10     | mg/l     | 20 | 09/17/13 20:00 | SK | EPA 300.0/SW846 9056  |
| pH                                     | 7.73     |        | su       | 1  | 09/19/13 14:10 | KB | SM4500HB+ -2011/9040C |

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-192819 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-1B          | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

### General Chemistry

| Analyte                   | Result | RL  | Units  | DF | Analyzed | By | Method         |
|---------------------------|--------|-----|--------|----|----------|----|----------------|
| Iron Reducing Bacteria    | 2300   | 25  | CFU/ml | 1  | 09/23/13 | MM | HACH IRB-BART  |
| Slime Forming Bacteria    | 66500  | 500 | CFU/ml | 1  | 09/23/13 | MM | HACH SLYM-BART |
| Sulfate Reducing Bacteria | 5000   | 200 | CFU/ml | 1  | 09/23/13 | MM | HACH SRB-BART  |

RL = Reporting Limit

4.2  
4

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-192819 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-1F          | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface H2O Filtered | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

### Dissolved Metals Analysis

| Analyte   | Result | RL   | Units | DF | Prep     | Analyzed By | Method                 | Prep Method            |
|-----------|--------|------|-------|----|----------|-------------|------------------------|------------------------|
| Barium    | 32.0   | 10   | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Boron     | 192    | 50   | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Calcium   | 69200  | 400  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Iron      | < 10   | 10   | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Magnesium | 50000  | 200  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Manganese | < 5.0  | 5.0  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Potassium | 3880   | 1000 | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Selenium  | 3.3    | 0.80 | ug/l  | 2  | 09/18/13 | 09/18/13 JB | EPA 200.8 <sup>2</sup> | EPA 200.8 <sup>4</sup> |
| Sodium    | 96100  | 400  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Strontium | 821    | 5.0  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |

- (1) Instrument QC Batch: MA3980
- (2) Instrument QC Batch: MA3983
- (3) Prep QC Batch: MP11112
- (4) Prep QC Batch: MP11116

RL = Reporting Limit

4.3  
4

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-417214 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-2           | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846 8260B               |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

| Run #  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 6V20956.D | 1  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |
| 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            | 106%   |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 89%    |        | 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

4.4  
4

## Report of Analysis

|   |   |
|---|---|
| <b>Client Sample ID:</b> SG 31-32-417214<br><b>Lab Sample ID:</b> D50583-2<br><b>Matrix:</b> AQ - Surface Water<br><b>Method:</b> RSK175 MOD<br><b>Project:</b> WWLCOGJ: WPX SG 31-32 | <b>Date Sampled:</b> 09/16/13<br><b>Date Received:</b> 09/17/13<br><b>Percent Solids:</b> n/a |
|---|---|

| Run #  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FB09432.D | 1  | 09/18/13 | JS | n/a       | n/a        | GFB414           |
| Run #2 |           |    |          |    |           |            |                  |

| Run #  | Initial Volume | Headspace Volume | Volume Injected | Temperature |
|--------|----------------|------------------|-----------------|-------------|
| Run #1 | 39.0 ml        | 4.0 ml           | 500 ul          | 23.0 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     | 0.022   | 0.011   | mg/l  |   |

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

4.4  
4

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-417214 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-2           | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846-8015B SW846 3510C   |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

| Run #  | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------|----|-----------|------------|------------------|
| Run #1 | FH013170.D | 1  | 09/19/13 | TU | 09/18/13  | OP8591     | GFH700           |
| 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%    |        | 20-140% |       |   |

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

4.4  
4

## Report of Analysis

|  |   |
|--|---|
| <b>Client Sample ID:</b> SG 31-32-417214<br><b>Lab Sample ID:</b> D50583-2<br><b>Matrix:</b> AQ - Surface Water<br><b>Project:</b> WWLCOGJ: WPX SG 31-32 | <b>Date Sampled:</b> 09/16/13<br><b>Date Received:</b> 09/17/13<br><b>Percent Solids:</b> n/a |
|--|---|

### General Chemistry

| Analyte                                | Result   | RL     | Units    | DF | Analyzed       | By | Method                |
|--|----------|--------|----------|----|----------------|----|-----------------------|
| Alkalinity, Bicarbonate as CaC         | 337      | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Alkalinity, Carbonate                  | < 5.0    | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Alkalinity, Total as CaCO <sub>3</sub> | 337      | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Bromide                                | 0.13     | 0.10   | mg/l     | 2  | 09/17/13 16:07 | SK | EPA 300.0/SW846 9056  |
| Chloride                               | 12.1     | 1.0    | mg/l     | 2  | 09/17/13 16:07 | SK | EPA 300.0/SW846 9056  |
| Fluoride                               | 0.33     | 0.20   | mg/l     | 2  | 09/17/13 16:07 | SK | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrate                      | 0.91     | 0.020  | mg/l     | 2  | 09/17/13 16:07 | SK | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrite <sup>a</sup>         | < 0.0080 | 0.0080 | mg/l     | 2  | 09/17/13 16:07 | SK | EPA 300.0/SW846 9056  |
| Phosphorus, Total                      | 0.037    | 0.010  | mg/l     | 1  | 09/24/13       | BF | HACH8190/SM4500P-B/E  |
| Solids, Total Dissolved                | 704      | 10     | mg/l     | 1  | 09/18/13       | RW | SM 2540C-2011         |
| Specific Conductivity                  | 957      | 1.0    | umhos/cm | 1  | 09/20/13       | RW | SM 2510B-2011         |
| Sulfate                                | 213      | 10     | mg/l     | 20 | 09/17/13 20:11 | SK | EPA 300.0/SW846 9056  |
| pH                                     | 7.75     |        | su       | 1  | 09/19/13 14:10 | KB | SM4500HB+ -2011/9040C |

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

4.4  
4

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-417214 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-2B          | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water        | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

### General Chemistry

| Analyte                   | Result | RL  | Units  | DF | Analyzed | By | Method         |
|---------------------------|--------|-----|--------|----|----------|----|----------------|
| Iron Reducing Bacteria    | < 25   | 25  | CFU/ml | 1  | 09/23/13 | MM | HACH IRB-BART  |
| Slime Forming Bacteria    | 66500  | 500 | CFU/ml | 1  | 09/23/13 | MM | HACH SLYM-BART |
| Sulfate Reducing Bacteria | 5000   | 200 | CFU/ml | 1  | 09/23/13 | MM | HACH SRB-BART  |

RL = Reporting Limit

4.5  
4

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-417214 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-2F          | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface H2O Filtered | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32    |                                |

### Dissolved Metals Analysis

| Analyte   | Result | RL   | Units | DF | Prep     | Analyzed By | Method                 | Prep Method            |
|-----------|--------|------|-------|----|----------|-------------|------------------------|------------------------|
| Barium    | 33.3   | 10   | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Boron     | 187    | 50   | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Calcium   | 70400  | 400  | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Iron      | < 10   | 10   | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Magnesium | 49500  | 200  | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Manganese | < 5.0  | 5.0  | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Potassium | 3950   | 1000 | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Selenium  | 3.3    | 0.80 | ug/l  | 2  | 09/18/13 | 09/18/13 JB | EPA 200.8 <sup>2</sup> | EPA 200.8 <sup>4</sup> |
| Sodium    | 100000 | 400  | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Strontium | 865    | 5.0  | ug/l  | 1  | 09/18/13 | 09/19/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |

- (1) Instrument QC Batch: MA3980
- (2) Instrument QC Batch: MA3983
- (3) Prep QC Batch: MP11112
- (4) Prep QC Batch: MP11116

RL = Reporting Limit

4.6  
4

## Report of Analysis

|                                       |                                |
|---------------------------------------|--------------------------------|
| <b>Client Sample ID:</b> TRIP BLANK   | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50583-3        | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Trip Blank Water  | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846 8260B            |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32 |                                |

| Run #               | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---------------------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 <sup>a</sup> | 7V22784.D | 1  | 09/19/13 | JL | n/a       | n/a        | V7V1254          |
| 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 | 109%   |        | 62-130% |
| 2037-26-5  | Toluene-D8            | 104%   |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 89%    |        | 69-130% |

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

ND = Not detected      MDL - Method Detection Limit  
 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

4.7  
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



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 #  
Accutest Job # **D50583**

| Client / Reporting Information                                       |                                | Project Information                               |         | Requested Analysis (see TEST CODE sheet)  |            |        |              |      |       |       |       |       |         | Matrix Codes   |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
|--|--------------------------------|---|---------|---|------------|--------|--------------|------|-------|-------|-------|-------|---------|--|--------|---------------|------------|-----------------------------|------|----------------------------------|---------------|--------------|----------|------|--------------------|---------------|
| Company Name<br><b>Western Water and Land, Inc.</b>                  |                                | Project Name<br><b>WPX SG 31-32</b>               |         | PH, SCOM, TDS<br>XCARBICALK<br>BRO, CHL, F, NO2, NO30, SO4<br>TPO4<br>*Dissolved Metals - Lab Filtered<br>VRSK175DGMPEP<br>V8260BXTXGRO<br>B801SDRO<br>BART<br>**Isotopic Methane |            |        |              |      |       |       |       |       |         | DW - Drinking Water<br>GW - Ground Water<br>WW - Water<br>SW - Surface Water<br>SO - Soil<br>SL - Sludge<br>SED - Sediment<br>OI - Oil<br>LIQ - Other Liquid<br>AIR - Air<br>SOL - Other Solid<br>WP - Wigs<br>FB - Field Blank<br>EB - Equipment Blank<br>RB - Rinse Blank<br>TB - Trip Blank |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
| Street Address<br><b>743 Horizon Ct., Suite 330</b>                  |                                | Street  |         |   |            |        |              |      |       |       |       |       |         |  |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
| City<br><b>Grand Junction, CO 81506</b>                              |                                | Billing Information (if different from Report to) |         |   |            |        |              |      |       |       |       |       |         |  |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
| Project Contact<br><b>Bruce Smith bsmith@westernwaterandland.com</b> |                                | Project #   |         |   |            |        |              |      |       |       |       |       |         |  |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
| Phone #<br><b>(970) 242-0170</b>                                     |                                | Client Purchase Order #                           |         |   |            |        |              |      |       |       |       |       |         |  |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
| Sampler(s) Name(s)<br><b>Nick Solawetz</b>                           |                                | Project Manager<br><b>Renea Jackson</b>           |         |   |            |        |              |      |       |       |       |       |         |  |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
|  |                                | Attribution<br><b>Brandon DanForth</b>            |         |   |            |        |              |      |       |       |       |       |         |  |        |               |            |                             |      |                                  |               |              |          |      |                    |               |
| Account Sample #   | Field ID / Point of Collection | MEOH/DI Vial #                                    | Date    | Time  | Sampled by | Matrix | # of bottles | SC1  | INH01 | INH02 | HS004 | HS006 | DI W/WR | MEOH   | ENCORE | PH, SCOM, TDS | XCARBICALK | BRO, CHL, F, NO2, NO30, SO4 | TPO4 | *Dissolved Metals - Lab Filtered | VRSK175DGMPEP | V8260BXTXGRO | B801SDRO | BART | **Isotopic Methane | LAB USE ONLY  |
|  | SG 31-32-192819                |   | 9-16-13 | 1045  | NS SW      | 15     | 6001         | 8000 |       |       |       |       |         |  |        | 1             | 1          | 1                           | 1    | 1                                | 3             | 3            | 2        | 1    | 1                  | 01            |
|  | SG 31-32-417214                |   | 9-16-13 | 1320  | NS SW      | 15     | 6001         | 8000 |       |       |       |       |         |  |        | 1             | 1          | 1                           | 1    | 1                                | 3             | 3            | 2        | 1    | 1                  | 02            |
|  | Trip BLK                       |   |         |   |            |        |              |      |       |       |       |       |         |  |        |               |            |                             |      |                                  |               |              |          |      |                    | 03-15<br>Cg/m |

| Turnaround Time (Business days)   |  | Data Deliverable Information   |  | Comments / Special Instructions   |  |   |  |
|---|--|--|--|---|--|---|--|
| <input type="checkbox"/> Std. 15 Business Days<br><input checked="" type="checkbox"/> Std. 10 Business Days<br><input type="checkbox"/> 5 Day RUSH<br><input type="checkbox"/> 3 Day Emergency<br><input type="checkbox"/> 2 Day Emergency<br><input type="checkbox"/> 1 Day Emergency<br>Emergency & Rush T/A data available VIA Lablink |  | Approved By (Accutest PM): / Date:<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____ |  | <input type="checkbox"/> Commercial "A" (Level 1)<br><input type="checkbox"/> Commercial "B" (Level 2)<br><input type="checkbox"/> COMMBN<br><input type="checkbox"/> COMMBN+<br><input type="checkbox"/> State Forms Required<br><input type="checkbox"/> Send Forms to State<br><input type="checkbox"/> Report by Fax<br><input type="checkbox"/> Report by PDF<br><input checked="" type="checkbox"/> EDD Format<br>Commercial "A" = Results Only<br>Commercial "B" = Results + QC Summary<br>Commercial BN = Results/QC/Narrative (+ = chromatogram) |  | *Dissolved Metals (200.7/200.8): Ba, B, Ca, Fe, Mg, Mn, K, SeMS, Na, Sr<br>**Hold pending RSK175 results<br><b>Not field filtered</b> |  |

|  |                              |                             |                         |   |  |
|--|------------------------------|-----------------------------|-------------------------|---|--|
| Relinquished by Sampler:<br>1 <b>Nick Solawetz</b> | Received By:<br>1 <b>DJR</b> | Date Time:<br>9/16/13 11:30 | Relinquished By:<br>2   | Date Time:  | Received By:   |
| Relinquished by Sampler:<br>3                      | Received By:<br>3            | Date Time:                  | Relinquished By:<br>4   | Date Time:  | Received By:<br>4  |
| Relinquished by:<br>5                              | Received By:<br>5            | Date Time:                  | Custody Seal # <b>H</b> | <input checked="" type="checkbox"/> Intact<br><input type="checkbox"/> Not Intact | Preserved where applicable<br><input type="checkbox"/> On Ice<br><input checked="" type="checkbox"/> Cooler Temp. <b>2.5</b> |

5.1  
5

D50583: Chain of Custody

Page 1 of 2



# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D50583

Client: WESTERN WATER & LAND INC.

Immediate Client Services Action Required: No

Date / Time Received: 9/17/2013 11:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: WPX SG 31-32

Airbill #'s: Fedex

| <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

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5.1  
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## 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:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V6V1161-MB | 6V20952.D | 1  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

| 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 | 95%    | 62-130% |
| 2037-26-5  | Toluene-D8            | 106%   | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 95%    | 69-130% |

## Method Blank Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V7V1254-MB | 7V22769.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

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

| CAS No.    | Surrogate Recoveries  | Limits |         |
|------------|-----------------------|--------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 108%   | 62-130% |
| 2037-26-5  | Toluene-D8            | 98%    | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 83%    | 69-130% |

# Blank Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V6V1161-BS | 6V20953.D | 1  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

| CAS No.   | Compound       | Spike<br>ug/l | BSP<br>ug/l | BSP<br>% | Limits |
|-----------|----------------|---------------|-------------|----------|--------|
| 71-43-2   | Benzene        | 50            | 48.1        | 96       | 70-130 |
| 100-41-4  | Ethylbenzene   | 50            | 53.9        | 108      | 70-130 |
| 108-88-3  | Toluene        | 50            | 52.8        | 106      | 70-130 |
| 1330-20-7 | Xylene (total) | 150           | 159         | 106      | 70-130 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 96%  | 62-130% |
| 2037-26-5  | Toluene-D8            | 105% | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 100% | 69-130% |

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V6V1161-BS | 6V20954.D | 1  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

| CAS No. | Compound         | Spike<br>ug/l | BSP<br>ug/l | BSP<br>% | Limits |
|---------|------------------|---------------|-------------|----------|--------|
|         | TPH-GRO (C6-C10) | 2200          | 1680        | 76       | 39-144 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95%  | 62-130% |
| 2037-26-5  | Toluene-D8            | 106% | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 96%  | 69-130% |

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V7V1254-BS | 7V22770.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

| CAS No.   | Compound       | Spike<br>ug/l | BSP<br>ug/l | BSP<br>% | Limits |
|-----------|----------------|---------------|-------------|----------|--------|
| 71-43-2   | Benzene        | 50            | 46.0        | 92       | 70-130 |
| 100-41-4  | Ethylbenzene   | 50            | 51.1        | 102      | 70-130 |
| 108-88-3  | Toluene        | 50            | 50.8        | 102      | 70-130 |
| 1330-20-7 | Xylene (total) | 150           | 153         | 102      | 70-130 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101% | 62-130% |
| 2037-26-5  | Toluene-D8            | 105% | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 111% | 69-130% |

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V7V1254-BS | 7V22771.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

| CAS No. | Compound         | Spike<br>ug/l | BSP<br>ug/l | BSP<br>% | Limits |
|---------|------------------|---------------|-------------|----------|--------|
|         | TPH-GRO (C6-C10) | 2200          | 1970        | 90       | 39-144 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 107% | 62-130% |
| 2037-26-5  | Toluene-D8            | 100% | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 94%  | 69-130% |

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| D50598-2MS | 6V20960.D | 5  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |
| D50598-2   | 6V20959.D | 5  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

| CAS No.   | Compound       | D50598-2<br>ug/l | Spike<br>Q | ug/l | MS<br>ug/l | MS<br>% | Limits |
|-----------|----------------|------------------|------------|------|------------|---------|--------|
| 71-43-2   | Benzene        | 2260             | E          | 250  | 2520       | 104     | 62-130 |
| 100-41-4  | Ethylbenzene   | 690              |            | 250  | 1000       | 124     | 63-130 |
| 108-88-3  | Toluene        | 171              |            | 250  | 431        | 104     | 60-130 |
| 1330-20-7 | Xylene (total) | 19.0             |            | 750  | 823        | 107     | 67-130 |

| CAS No.    | Surrogate Recoveries  | MS   | D50598-2 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95%  | 106%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 105% | 110%     | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 97%  | 94%      | 69-130% |

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| D50598-2MS | 6V20961.D | 5  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |
| D50598-2   | 6V20959.D | 5  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

| CAS No. | Compound         | D50598-2<br>ug/l | Spike<br>Q | ug/l  | MS<br>ug/l | MS<br>% | Limits |
|---------|------------------|------------------|------------|-------|------------|---------|--------|
|         | TPH-GRO (C6-C10) | 4380             |            | 11000 | 12900      | 77      | 19-168 |

| CAS No.    | Surrogate Recoveries  | MS   | D50598-2 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97%  | 106%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 108% | 110%     | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 98%  | 94%      | 69-130% |

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample                  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------------------|-----------|----|----------|----|-----------|------------|------------------|
| D48569-7MS <sup>a</sup> | 7V22772.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |
| D48569-7 <sup>a</sup>   | 7V22774.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

| CAS No.   | Compound       | D48569-7<br>ug/l | Spike<br>Q | ug/l | MS<br>ug/l | MS<br>% | Limits |
|-----------|----------------|------------------|------------|------|------------|---------|--------|
| 71-43-2   | Benzene        | ND               | 50         | 46.8 | 94         | 62-130  |        |
| 100-41-4  | Ethylbenzene   | ND               | 50         | 46.5 | 93         | 63-130  |        |
| 108-88-3  | Toluene        | ND               | 50         | 49.1 | 98         | 60-130  |        |
| 1330-20-7 | Xylene (total) | ND               | 150        | 145  | 97         | 67-130  |        |

| CAS No.    | Surrogate Recoveries  | MS   | D48569-7 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | 112%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 105% | 104%     | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 104% | 85%      | 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:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample                  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------------------|-----------|----|----------|----|-----------|------------|------------------|
| D48569-7MS <sup>a</sup> | 7V22773.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |
| D48569-7 <sup>a</sup>   | 7V22774.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

| CAS No. | Compound         | D48569-7<br>ug/l | Spike<br>Q | MS<br>ug/l | MS<br>% | Limits |
|---------|------------------|------------------|------------|------------|---------|--------|
|         | TPH-GRO (C6-C10) | ND               | 2200       | 2020       | 92      | 19-168 |

| CAS No.    | Surrogate Recoveries  | MS   | D48569-7 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98%  | 112%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 101% | 104%     | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 95%  | 85%      | 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:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D50589-4DUP | 6V20958.D | 5  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |
| D50589-4    | 6V20957.D | 5  | 09/18/13 | BR | n/a       | n/a        | V6V1161          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-1, D50583-2

| CAS No.   | Compound         | D50589-4<br>ug/l | DUP<br>Q | DUP<br>ug/l | Q | RPD | Limits |
|-----------|------------------|------------------|----------|-------------|---|-----|--------|
| 71-43-2   | Benzene          | 2060             | E        | 2000        | E | 3   | 30     |
| 100-41-4  | Ethylbenzene     | ND               |          | ND          |   | nc  | 30     |
| 108-88-3  | Toluene          | ND               |          | ND          |   | nc  | 30     |
| 1330-20-7 | Xylene (total)   | 137              |          | 130         |   | 5   | 30     |
|           | TPH-GRO (C6-C10) | 2940             |          | 2820        |   | 4   | 30     |

| CAS No.    | Surrogate Recoveries  | DUP  | D50589-4 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98%  | 101%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 107% | 107%     | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 92%  | 92%      | 69-130% |

\* = Outside of Control Limits.

# Duplicate Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D50581-1DUP | 7V22776.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |
| D50581-1    | 7V22775.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50583-3

| CAS No.   | Compound         | D50581-1<br>ug/l | DUP<br>Q | DUP<br>ug/l | Q | RPD | Limits |
|-----------|------------------|------------------|----------|-------------|---|-----|--------|
| 71-43-2   | Benzene          | 1.4              |          | 1.4         |   | 0   | 30     |
| 100-41-4  | Ethylbenzene     | 3.8              |          | 3.7         |   | 3   | 30     |
| 108-88-3  | Toluene          | ND               |          | ND          |   | nc  | 30     |
| 1330-20-7 | Xylene (total)   | 25.2             |          | 24.6        |   | 2   | 30     |
|           | TPH-GRO (C6-C10) | 403              |          | 399         |   | 1   | 30     |

| CAS No.    | Surrogate Recoveries  | DUP  | D50581-1 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | 108%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 99%  | 99%      | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 94%  | 96%      | 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:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| GFB414-MB | FB09426.D | 1  | 09/18/13 | JS | n/a       | n/a        | GFB414           |

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50583-1, D50583-2

| CAS No. | Compound | Result | RL      | MDL     | Units | Q |
|---------|----------|--------|---------|---------|-------|---|
| 74-82-8 | Methane  | ND     | 0.00080 | 0.00040 | mg/l  |   |
| 74-84-0 | Ethane   | ND     | 0.0016  | 0.00080 | mg/l  |   |
| 74-98-6 | Propane  | ND     | 0.022   | 0.011   | mg/l  |   |

7.1.1  
7

# Blank Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| GFB414-BS | FB09427.D | 10 | 09/18/13 | JS | n/a       | n/a        | GFB414           |

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50583-1, D50583-2

| CAS No. | Compound | Spike<br>mg/l | BSP<br>mg/l | BSP<br>% | Limits |
|---------|----------|---------------|-------------|----------|--------|
| 74-82-8 | Methane  | 0.51          | 0.501       | 98       | 70-130 |
| 74-84-0 | Ethane   | 0.956         | 0.751       | 79       | 70-130 |
| 74-98-6 | Propane  | 1.4           | 1.12        | 80       | 67-130 |

7.2.1  
7

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample                   | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------------------|-----------|----|----------|----|-----------|------------|------------------|
| D50582-1MS <sup>a</sup>  | FB09429.D | 10 | 09/18/13 | JS | n/a       | n/a        | GFB414           |
| D50582-1MSD <sup>a</sup> | FB09430.D | 10 | 09/18/13 | JS | n/a       | n/a        | GFB414           |
| D50582-1 <sup>a</sup>    | FB09428.D | 1  | 09/18/13 | JS | n/a       | n/a        | GFB414           |

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50583-1, D50583-2

| CAS No. | Compound | D50582-1<br>mg/l | Spike<br>Q<br>mg/l | MS<br>mg/l | MS<br>% | MSD<br>mg/l | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|----------|------------------|--------------------|------------|---------|-------------|----------|-----|-------------------|
| 74-82-8 | Methane  | 0.0017           | 0.51               | 0.531      | 104     | 0.533       | 104      | 0   | 51-155/30         |
| 74-84-0 | Ethane   | ND               | 0.956              | 0.835      | 87      | 0.840       | 88       | 1   | 58-130/30         |
| 74-98-6 | Propane  | ND               | 1.4                | 1.32       | 94      | 1.34        | 96       | 2   | 46-130/30         |

(a) Sample pH > 2 at time of analysis.

\* = Outside of Control Limits.

7.3.1  
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## 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:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|------------|----|----------|----|-----------|------------|------------------|
| OP8591-MB | FH013122.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |

The QC reported here applies to the following samples:

Method: SW846-8015B

D50583-1, D50583-2

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

| CAS No. | Surrogate Recoveries | Limits      |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl          | 35% 20-140% |

# Blank Spike Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|------------|----|----------|----|-----------|------------|------------------|
| OP8591-BS | FH013124.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |

The QC reported here applies to the following samples:

Method: SW846-8015B

D50583-1, D50583-2

| CAS No. | Compound          | Spike mg/l | BSP mg/l | BSP % | Limits |
|---------|-------------------|------------|----------|-------|--------|
|         | TPH-DRO (C10-C28) | 20         | 11.2     | 56    | 36-140 |

| CAS No. | Surrogate Recoveries | BSP | Limits  |
|---------|----------------------|-----|---------|
| 84-15-1 | o-Terphenyl          | 47% | 20-140% |

8.2.1

8

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D50583  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|------------|----|----------|----|-----------|------------|------------------|
| OP8591-MS  | FH013126.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |
| OP8591-MSD | FH013128.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |
| D48569-3   | FH013130.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |

The QC reported here applies to the following samples:

Method: SW846-8015B

D50583-1, D50583-2

| CAS No. | Compound          | D48569-3<br>mg/l | Spike<br>Q<br>mg/l | MS<br>mg/l | MS<br>% | MSD<br>mg/l | MSD<br>% | RPD  | Limits<br>Rec/RPD |
|---------|-------------------|------------------|--------------------|------------|---------|-------------|----------|------|-------------------|
|         | TPH-DRO (C10-C28) | ND               | 20                 | 10.4       | 52      | 12.9        | 65       | 170* | 28-140/30         |

| CAS No. | Surrogate Recoveries | MS  | MSD | D48569-3 | Limits  |
|---------|----------------------|-----|-----|----------|---------|
| 84-15-1 | o-Terphenyl          | 61% | 73% | 51%      | 20-140% |

8.3.1  
8

\* = 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: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 09/18/13

| Metal      | RL   | IDL | MDL | MB<br>raw | final |
|------------|------|-----|-----|-----------|-------|
| Aluminum   | 100  | 8.6 | 11  |           |       |
| Antimony   | 30   | 3.2 | 21  |           |       |
| Arsenic    | 25   | 5.2 | 9   |           |       |
| Barium     | 10   | 1.4 | 1.4 | 1.7       | <10   |
| Beryllium  | 10   | .8  | 1.7 |           |       |
| Boron      | 50   | 6.7 | 6.6 | 6.0       | <50   |
| Cadmium    | 10   | .4  | .36 |           |       |
| Calcium    | 400  | 2.2 | 66  | 18.3      | <400  |
| Chromium   | 10   | .4  | 1.4 |           |       |
| Cobalt     | 5.0  | .4  | .51 |           |       |
| Copper     | 10   | 1.2 | 1.5 |           |       |
| Iron       | 10   | 2.2 | 3.2 | 2.4       | <10   |
| Lead       | 50   | 3.6 | 4.1 |           |       |
| Lithium    | 5.0  | 1.9 | 1.9 |           |       |
| Magnesium  | 200  | 14  | 29  | 2.0       | <200  |
| Manganese  | 5.0  | .01 | .29 | 0.0       | <5.0  |
| Molybdenum | 10   | .8  | 1.1 |           |       |
| Nickel     | 30   | .9  | .87 |           |       |
| Phosphorus | 100  | 15  | 24  |           |       |
| Potassium  | 1000 | 130 | 230 | 83.0      | <1000 |
| Selenium   | 50   | 8.8 | 9.3 |           |       |
| Silicon    | 50   | 5.2 | 5.6 |           |       |
| Silver     | 30   | .4  | .4  |           |       |
| Sodium     | 400  | 4.9 | 36  | 73.8      | <400  |
| Strontium  | 5.0  | .01 | .12 | 0.10      | <5.0  |
| Thallium   | 10   | 2.9 | 4.9 |           |       |
| Tin        | 50   | 13  | 13  |           |       |
| Titanium   | 10   | .15 | .43 |           |       |
| Uranium    | 50   | 3.7 | 3.9 |           |       |
| Vanadium   | 10   | .4  | .39 |           |       |
| Zinc       | 30   | .6  | 1.9 |           |       |

Associated samples MP11112: D50583-1F, D50583-2F

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | D50583-1F<br>Original MS |        | SpikeLot<br>ICPAL2 % Rec |       | QC<br>Limits |
|------------|--------------------------|--------|--------------------------|-------|--------------|
| Aluminum   |                          |        |                          |       |              |
| Antimony   |                          |        |                          |       |              |
| Arsenic    |                          |        |                          |       |              |
| Barium     | 32.0                     | 2080   | 2000                     | 102.4 | 70-130       |
| Beryllium  |                          |        |                          |       |              |
| Boron      | 192                      | 1260   | 1000                     | 106.8 | 70-130       |
| Cadmium    |                          |        |                          |       |              |
| Calcium    | 67800                    | 93300  | 25000                    | 96.4  | 70-130       |
| Chromium   |                          |        |                          |       |              |
| Cobalt     |                          |        |                          |       |              |
| Copper     | anr                      |        |                          |       |              |
| Iron       | 0.0                      | 4840   | 5000                     | 96.8  | 70-130       |
| Lead       |                          |        |                          |       |              |
| Lithium    |                          |        |                          |       |              |
| Magnesium  | 50000                    | 74700  | 25000                    | 98.8  | 70-130       |
| Manganese  | 0.10                     | 514    | 500                      | 102.8 | 70-130       |
| Molybdenum |                          |        |                          |       |              |
| Nickel     | anr                      |        |                          |       |              |
| Phosphorus |                          |        |                          |       |              |
| Potassium  | 3880                     | 32800  | 25000                    | 115.7 | 70-130       |
| Selenium   |                          |        |                          |       |              |
| Silicon    |                          |        |                          |       |              |
| Silver     |                          |        |                          |       |              |
| Sodium     | 92600                    | 124000 | 25000                    | 111.6 | 70-130       |
| Strontium  | 821                      | 1350   | 500                      | 105.8 | 70-130       |
| Thallium   |                          |        |                          |       |              |
| Tin        |                          |        |                          |       |              |
| Titanium   |                          |        |                          |       |              |
| Uranium    |                          |        |                          |       |              |
| Vanadium   |                          |        |                          |       |              |
| Zinc       | anr                      |        |                          |       |              |

Associated samples MP11112: D50583-1F, D50583-2F

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

9.1.2  
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | D50583-1F<br>Original MSD |        | SpikeLot<br>ICPAL2 % Rec |       | MSD<br>RPD | QC<br>Limit |
|------------|---------------------------|--------|--------------------------|-------|------------|-------------|
| Aluminum   |                           |        |                          |       |            |             |
| Antimony   |                           |        |                          |       |            |             |
| Arsenic    |                           |        |                          |       |            |             |
| Barium     | 32.0                      | 2060   | 2000                     | 101.4 | 1.0        | 20          |
| Beryllium  |                           |        |                          |       |            |             |
| Boron      | 192                       | 1270   | 1000                     | 107.8 | 0.8        | 20          |
| Cadmium    |                           |        |                          |       |            |             |
| Calcium    | 67800                     | 94200  | 25000                    | 100.0 | 1.0        | 20          |
| Chromium   |                           |        |                          |       |            |             |
| Cobalt     |                           |        |                          |       |            |             |
| Copper     | anr                       |        |                          |       |            |             |
| Iron       | 0.0                       | 4810   | 5000                     | 96.2  | 0.6        | 20          |
| Lead       |                           |        |                          |       |            |             |
| Lithium    |                           |        |                          |       |            |             |
| Magnesium  | 50000                     | 74900  | 25000                    | 99.6  | 0.3        | 20          |
| Manganese  | 0.10                      | 513    | 500                      | 102.6 | 0.2        | 20          |
| Molybdenum |                           |        |                          |       |            |             |
| Nickel     | anr                       |        |                          |       |            |             |
| Phosphorus |                           |        |                          |       |            |             |
| Potassium  | 3880                      | 32900  | 25000                    | 116.1 | 0.3        | 20          |
| Selenium   |                           |        |                          |       |            |             |
| Silicon    |                           |        |                          |       |            |             |
| Silver     |                           |        |                          |       |            |             |
| Sodium     | 92600                     | 125000 | 25000                    | 115.6 | 0.8        | 20          |
| Strontium  | 821                       | 1350   | 500                      | 105.8 | 0.0        | 20          |
| Thallium   |                           |        |                          |       |            |             |
| Tin        |                           |        |                          |       |            |             |
| Titanium   |                           |        |                          |       |            |             |
| Uranium    |                           |        |                          |       |            |             |
| Vanadium   |                           |        |                          |       |            |             |
| Zinc       | anr                       |        |                          |       |            |             |

Associated samples MP11112: D50583-1F, D50583-2F

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

9.1.2  
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50583  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | BSP Result | SpikeLot ICPALL2 | % Rec | QC Limits |
|------------|------------|------------------|-------|-----------|
| Aluminum   |            |                  |       |           |
| Antimony   |            |                  |       |           |
| Arsenic    |            |                  |       |           |
| Barium     | 1970       | 2000             | 98.5  | 85-115    |
| Beryllium  |            |                  |       |           |
| Boron      | 1050       | 1000             | 105.0 | 85-115    |
| Cadmium    |            |                  |       |           |
| Calcium    | 25100      | 25000            | 100.4 | 85-115    |
| Chromium   |            |                  |       |           |
| Cobalt     |            |                  |       |           |
| Copper     | anr        |                  |       |           |
| Iron       | 4790       | 5000             | 95.8  | 85-115    |
| Lead       |            |                  |       |           |
| Lithium    |            |                  |       |           |
| Magnesium  | 24800      | 25000            | 99.2  | 85-115    |
| Manganese  | 512        | 500              | 102.4 | 85-115    |
| Molybdenum |            |                  |       |           |
| Nickel     | anr        |                  |       |           |
| Phosphorus |            |                  |       |           |
| Potassium  | 26000      | 25000            | 104.0 | 85-115    |
| Selenium   |            |                  |       |           |
| Silicon    |            |                  |       |           |
| Silver     |            |                  |       |           |
| Sodium     | 25800      | 25000            | 103.2 | 85-115    |
| Strontium  | 504        | 500              | 100.8 | 85-115    |
| Thallium   |            |                  |       |           |
| Tin        |            |                  |       |           |
| Titanium   |            |                  |       |           |
| Uranium    |            |                  |       |           |
| Vanadium   |            |                  |       |           |
| Zinc       | anr        |                  |       |           |

Associated samples MP11112: D50583-1F, D50583-2F

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

9.1.3  
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11112  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116  
Matrix Type: AQUEOUS

Methods: EPA 200.8  
Units: ug/l

Prep Date: 09/18/13

| Metal      | RL   | IDL   | MDL  | MB<br>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  | 0.018     | <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 MP11116: D50583-1F, D50583-2F

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

9.2.1  
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | D50583-2F<br>Original MS | SpikeLot<br>ICPAL2 | % Rec | QC<br>Limits |
|------------|--------------------------|--------------------|-------|--------------|
| Aluminum   |                          |                    |       |              |
| Antimony   |                          |                    |       |              |
| Arsenic    | anr                      |                    |       |              |
| Barium     |                          |                    |       |              |
| Beryllium  |                          |                    |       |              |
| Boron      |                          |                    |       |              |
| Cadmium    | anr                      |                    |       |              |
| Calcium    |                          |                    |       |              |
| Chromium   |                          |                    |       |              |
| Cobalt     |                          |                    |       |              |
| Copper     |                          |                    |       |              |
| Iron       | anr                      |                    |       |              |
| Lead       |                          |                    |       |              |
| Magnesium  |                          |                    |       |              |
| Manganese  | anr                      |                    |       |              |
| Molybdenum |                          |                    |       |              |
| Nickel     |                          |                    |       |              |
| Phosphorus |                          |                    |       |              |
| Potassium  |                          |                    |       |              |
| Selenium   | 3.3                      | 184                | 200   | 90.4 70-130  |
| Silver     | anr                      |                    |       |              |
| Sodium     |                          |                    |       |              |
| Strontium  |                          |                    |       |              |
| Thallium   |                          |                    |       |              |
| Tin        |                          |                    |       |              |
| Titanium   |                          |                    |       |              |
| Uranium    | anr                      |                    |       |              |
| Vanadium   |                          |                    |       |              |
| Zinc       |                          |                    |       |              |

Associated samples MP11116: D50583-1F, D50583-2F

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

9.2.2  
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50583  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | D50583-2F<br>Original MSD | Spikelot<br>ICPAL2 | % Rec | MSD<br>RPD | QC<br>Limit |    |
|------------|---------------------------|--------------------|-------|------------|-------------|----|
| Aluminum   |                           |                    |       |            |             |    |
| Antimony   |                           |                    |       |            |             |    |
| Arsenic    | anr                       |                    |       |            |             |    |
| Barium     |                           |                    |       |            |             |    |
| Beryllium  |                           |                    |       |            |             |    |
| Boron      |                           |                    |       |            |             |    |
| Cadmium    | anr                       |                    |       |            |             |    |
| Calcium    |                           |                    |       |            |             |    |
| Chromium   |                           |                    |       |            |             |    |
| Cobalt     |                           |                    |       |            |             |    |
| Copper     |                           |                    |       |            |             |    |
| Iron       | anr                       |                    |       |            |             |    |
| Lead       |                           |                    |       |            |             |    |
| Magnesium  |                           |                    |       |            |             |    |
| Manganese  | anr                       |                    |       |            |             |    |
| Molybdenum |                           |                    |       |            |             |    |
| Nickel     |                           |                    |       |            |             |    |
| Phosphorus |                           |                    |       |            |             |    |
| Potassium  |                           |                    |       |            |             |    |
| Selenium   | 3.3                       | 184                | 200   | 90.4       | 0.0         | 20 |
| Silver     | anr                       |                    |       |            |             |    |
| Sodium     |                           |                    |       |            |             |    |
| Strontium  |                           |                    |       |            |             |    |
| Thallium   |                           |                    |       |            |             |    |
| Tin        |                           |                    |       |            |             |    |
| Titanium   |                           |                    |       |            |             |    |
| Uranium    | anr                       |                    |       |            |             |    |
| Vanadium   |                           |                    |       |            |             |    |
| Zinc       |                           |                    |       |            |             |    |

Associated samples MP11116: D50583-1F, D50583-2F

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

9.2.2  
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50583  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11116  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | BSP<br>Result | Spikelot<br>ICPALL2 | % Rec | QC<br>Limits |
|------------|---------------|---------------------|-------|--------------|
| Aluminum   |               |                     |       |              |
| Antimony   |               |                     |       |              |
| Arsenic    | anr           |                     |       |              |
| Barium     |               |                     |       |              |
| Beryllium  |               |                     |       |              |
| Boron      |               |                     |       |              |
| Cadmium    | anr           |                     |       |              |
| Calcium    |               |                     |       |              |
| Chromium   |               |                     |       |              |
| Cobalt     |               |                     |       |              |
| Copper     |               |                     |       |              |
| Iron       | anr           |                     |       |              |
| Lead       |               |                     |       |              |
| Magnesium  |               |                     |       |              |
| Manganese  | anr           |                     |       |              |
| Molybdenum |               |                     |       |              |
| Nickel     |               |                     |       |              |
| Phosphorus |               |                     |       |              |
| Potassium  |               |                     |       |              |
| Selenium   | 196           | 200                 | 98.0  | 85-115       |
| Silver     | anr           |                     |       |              |
| Sodium     |               |                     |       |              |
| Strontium  |               |                     |       |              |
| Thallium   |               |                     |       |              |
| Tin        |               |                     |       |              |
| Titanium   |               |                     |       |              |
| Uranium    | anr           |                     |       |              |
| Vanadium   |               |                     |       |              |
| Zinc       |               |                     |       |              |

Associated samples MP11116: D50583-1F, D50583-2F

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

9.2.3  
 9

## General Chemistry

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### QC Data Summaries

---

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                        | Batch ID        | RL     | MB Result | Units    | Spike Amount | BSP Result | BSP %Recov | QC Limits   |
|--------------------------------|-----------------|--------|-----------|----------|--------------|------------|------------|-------------|
| Alkalinity, Bicarbonate as CaC | GN21996         | 5.0    | 2.0       | mg/l     | 100          | 95.0       | 94.9       | 90-110%     |
| Alkalinity, Carbonate          | GN21997         | 5.0    | 0.0       | mg/l     | 100          | 95.0       | 94.9       | 80-120%     |
| Alkalinity, Total as CaCO3     | GN21995         | 5.0    | 2.0       | mg/l     | 100          | 95.0       | 94.9       | 90-110%     |
| Bromide                        | GP10946/GN21930 | 0.050  | 0.0       | mg/l     | 20           | 19.7       | 98.5       | 90-110%     |
| Chloride                       | GP10946/GN21930 | 0.50   | 0.0       | mg/l     | 20           | 20.0       | 100.0      | 90-110%     |
| Fluoride                       | GP10946/GN21930 | 0.10   | 0.0       | mg/l     | 10           | 9.62       | 96.2       | 90-110%     |
| Iron Reducing Bacteria         | MB251           | 25     | <25       | CFU/ml   |              |            |            |             |
| Nitrogen, Nitrate              | GP10946/GN21930 | 0.010  | 0.0       | mg/l     | 4.52         | 4.44       | 98.3       | 90-110%     |
| Nitrogen, Nitrite              | GP10946/GN21930 | 0.0040 | 0.0       | mg/l     | 6.09         | 6.20       | 101.8      | 90-110%     |
| Phosphorus, Total              | GP11000/GN22026 | 0.010  | 0.0       | mg/l     | 0.304        | 0.33       | 109.2      | 80-120%     |
| Slime Forming Bacteria         | MB252           | 500    | <500      | CFU/ml   |              |            |            |             |
| Solids, Total Dissolved        | GN21944         | 10     | 0.0       | mg/l     | 400          | 395        | 98.8       | 90-110%     |
| Specific Conductivity          | GP10973/GN21980 |        |           | umhos/cm | 99.7         | 93.1       | 93.4       | 90-110%     |
| Sulfate                        | GP10946/GN21930 | 0.50   | 0.0       | mg/l     | 30           | 29.4       | 98.0       | 90-110%     |
| Sulfate Reducing Bacteria      | MB253           | 200    | <200      | CFU/ml   |              |            |            |             |
| pH                             | GN21969         |        |           | su       | 8.00         | 8.00       | 100.0      | 99.3-100.7% |

Associated Samples:

Batch MB251: D50583-1B, D50583-2B  
Batch MB252: D50583-1B, D50583-2B  
Batch MB253: D50583-1B, D50583-2B  
Batch GN21944: D50583-1, D50583-2  
Batch GN21969: D50583-1, D50583-2  
Batch GN21995: D50583-1, D50583-2  
Batch GN21996: D50583-1, D50583-2  
Batch GN21997: D50583-1, D50583-2  
Batch GP10946: D50583-1, D50583-2  
Batch GP10973: D50583-1, D50583-2  
Batch GP11000: D50583-1, D50583-2

(\* ) Outside of QC limits

10.1  
10

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50583  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                    | Batch ID        | QC Sample | Units    | Original Result | DUP Result | RPD | QC Limits |
|----------------------------|-----------------|-----------|----------|-----------------|------------|-----|-----------|
| Alkalinity, Total as CaCO3 | GN21995         | D50545-1  | mg/l     | 169             | 167        | 1.0 | 0-20%     |
| Phosphorus, Total          | GP11000/GN22026 | D50441-1  | mg/l     | 0.065           | 0.067      | 3.0 | 0-20%     |
| Solids, Total Dissolved    | GN21944         | D50439-1  | mg/l     | 600             | 632        | 5.2 | 0-20%     |
| Specific Conductivity      | GP10973/GN21980 | D50582-1  | umhos/cm | 744             | 736        | 1.1 | 0-20%     |

Associated Samples:

Batch GN21944: D50583-1, D50583-2

Batch GN21995: D50583-1, D50583-2

Batch GP10973: D50583-1, D50583-2

Batch GP11000: D50583-1, D50583-2

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50583  
Account: WILLCOOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                    | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec  | QC Limits |
|----------------------------|-----------------|-----------|-------|-----------------|--------------|-----------|-------|-----------|
| Alkalinity, Total as CaCO3 | GN21995         | D50545-1  | mg/l  | 169             | 100          | 261       | 92.1  | 80-120%   |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 2.5          | 2.6       | 104.0 | 80-120%   |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.054           | 2.5          | 2.6       | 104.0 | 80-120%   |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 36.3            | 500          | 525       | 95.8  | 80-120%   |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 46.2            | 500          | 525       | 95.8  | 80-120%   |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 3.2             | 2.5          | 2.9       | 105.6 | 80-120%   |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 0.26            | 2.5          | 2.9       | 105.6 | 80-120%   |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 13.2            | 28.3         | 42.4      | 103.4 | 80-120%   |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 17.6            | 28.3         | 42.4      | 103.4 | 80-120%   |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0084          | 0.305        | 0.32      | 102.3 | 80-120%   |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 0.305        | 0.32      | 102.3 | 80-120%   |
| Phosphorus, Total          | GP11000/GN22026 | D50441-1  | mg/l  | 0.065           | 0.40         | 0.42      | 88.8  | 80-120%   |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 19.5            | 10           | 24.8      | 108.3 | 80-120%   |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 14.0            | 10           | 24.8      | 108.3 | 80-120%   |

Associated Samples:

Batch GN21995: D50583-1, D50583-2

Batch GP10946: D50583-1, D50583-2

Batch GP11000: D50583-1, D50583-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.3  
10

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50583  
Account: WILLCOOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                    | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MSD Result | RPD | QC Limit |
|----------------------------|-----------------|-----------|-------|-----------------|--------------|------------|-----|----------|
| Alkalinity, Total as CaCO3 | GN21995         | D50545-1  | mg/l  | 169             | 100          | 261        | 0.1 | 20%      |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 2.5          | 2.6        | 0.0 | 20%      |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.054           | 2.5          | 2.6        | 0.0 | 20%      |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 36.3            | 500          | 516        | 1.7 | 20%      |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 46.2            | 500          | 516        | 1.7 | 20%      |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 3.2             | 2.5          | 2.9        | 0.0 | 20%      |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 0.26            | 2.5          | 2.9        | 0.0 | 20%      |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 13.2            | 28.3         | 42.0       | 0.9 | 20%      |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 17.6            | 28.3         | 42.0       | 0.9 | 20%      |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0084          | 0.305        | 0.31       | 3.2 | 20%      |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 0.305        | 0.31       | 3.2 | 20%      |
| Phosphorus, Total          | GP11000/GN22026 | D50441-1  | mg/l  | 0.065           | 0.40         | 0.420      | 0.0 | 20%      |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 19.5            | 10           | 24.8       | 0.0 | 20%      |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 14.0            | 10           | 24.8       | 0.0 | 20%      |

Associated Samples:

Batch GN21995: D50583-1, D50583-2

Batch GP10946: D50583-1, D50583-2

Batch GP11000: D50583-1, D50583-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4  
10

Technical Report for

WPX Energy Rocky Mountain, LLC

WWLCOGJ: WPX SG 31-32

Accutest Job Number: D50582

Sampling Date: 09/16/13

Report to:

Western Water and Land, Inc.  
743 Horizon Court Suite 330  
Grand Junction, CO 81506  
bsmith@westernwaterandland.com; jpahler@westernwaterandland.com  
ATTN: Bruce Smith

Total number of pages in report: **51**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference 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: D50582

WWLCOGJ: WPX SG 31-32

| Sample Number | Collected Date | Time By  | Received | Matrix Code | Type                 | Client Sample ID          |
|---------------|----------------|----------|----------|-------------|----------------------|---------------------------|
| D50582-1      | 09/16/13       | 09:46 NS | 09/17/13 | AQ          | Surface Water        | SG 31-32-CO RIVER         |
| D50582-1B     | 09/16/13       | 09:46 NS | 09/17/13 | AQ          | Surface Water        | SG 31-32-CO RIVER         |
| D50582-1F     | 09/16/13       | 09:46 NS | 09/17/13 | AQ          | Surface H2O Filtered | SG 31-32-CO RIVER         |
| D50582-2      | 09/16/13       | 00:00 NS | 09/17/13 | AQ          | Trip Blank Water     | TRIP BLK #3 469425,469712 |



## CASE NARRATIVE / CONFORMANCE SUMMARY

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

**Job No** D50582

**Site:** WWLCOGJ: WPX SG 31-32

**Report Date** 10/1/2013 10:37:07 AM

On 09/17/2013, 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 D50582 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:** V7V1254

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50581-1DUP, D48569-7MS were used as the QC samples indicated.
- D48569-7MS: The pH of the sample aliquot for VOA analysis was >2 at time of analysis.
- D48569-7MS: 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:** GFB414

- All samples were analyzed within the recommended method holding time.
- Sample(s) D50582-1MS, D50582-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D50582-1MS: Sample pH >2 at time of analysis.
- D50582-1: Sample pH >2 at time of analysis.
- D50582-1MSD: Sample pH >2 at time of analysis.

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

**Matrix** AQ **Batch ID:** OP8591

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D48569-3MS, D48569-3MSD were used as the QC samples indicated.
- The RPD(s) for the MS and MSD recoveries of TPH-DRO (C10-C28) are outside control limits for sample OP8591-MSD. Probable cause due to sample homogeneity.

### Metals By Method EPA 200.7

**Matrix** AQ **Batch ID:** MP11115

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50586-1AMS, D50586-1AMSD were used as the QC samples for the metals analysis.

## Metals By Method EPA 200.8

|                  |                          |
|------------------|--------------------------|
| <b>Matrix</b> AQ | <b>Batch ID:</b> MP11129 |
|------------------|--------------------------|

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50613-1FMS, D50613-1FMSD 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> GP10946 |
|------------------|--------------------------|

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50578-2MS, D50578-2MSD 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> MB251 |
|------------------|------------------------|

- 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> MB252 |
|------------------|------------------------|

- 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> MB253 |
|------------------|------------------------|

- 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> GP11000 |
|------------------|--------------------------|

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50441-1DUP, D50441-1MS, D50441-1MSD were used as the QC samples for the Phosphorus, Total analysis.

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

**Matrix** AQ **Batch ID:** GN21995

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50545-1DUP, D50545-1MS, D50545-1MSD were used as the QC samples for the Alkalinity, Total as CaCO<sub>3</sub> analysis.

**Matrix** AQ **Batch ID:** GN21996

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

**Matrix** AQ **Batch ID:** GN21997

- 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:** GP10973

- Sample(s) D50582-1DUP were used as the QC samples for the Specific Conductivity analysis.

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

**Matrix** AQ **Batch ID:** GN21944

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D50439-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

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

**Matrix** AQ **Batch ID:** GN21969

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D50582-1

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:** D50582  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32  
**Collected:** 09/16/13



| Lab Sample ID | Client Sample ID | Result/<br>Qual | RL | MDL | Units | Method |
|---------------|------------------|-----------------|----|-----|-------|--------|
|---------------|------------------|-----------------|----|-----|-------|--------|

**D50582-1 SG 31-32-CO RIVER**

|                                  |        |         |         |          |                       |
|----------------------------------|--------|---------|---------|----------|-----------------------|
| Methane <sup>a</sup>             | 0.0017 | 0.00080 | 0.00040 | mg/l     | RSK175 MOD            |
| Alkalinity, Bicarbonate as CaCO3 | 113    | 5.0     |         | mg/l     | SM 2320B-2011         |
| Alkalinity, Total as CaCO3       | 113    | 5.0     |         | mg/l     | SM 2320B-2011         |
| Chloride                         | 120    | 5.0     |         | mg/l     | EPA 300.0/SW846 9056  |
| Fluoride                         | 0.25   | 0.10    |         | mg/l     | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrate                | 0.19   | 0.010   |         | mg/l     | EPA 300.0/SW846 9056  |
| Phosphorus, Total                | 1.4    | 0.050   |         | mg/l     | HACH8190/SM4500P-B/E  |
| Solids, Total Dissolved          | 448    | 10      |         | mg/l     | SM 2540C-2011         |
| Specific Conductivity            | 744    | 1.0     |         | umhos/cm | SM 2510B-2011         |
| Sulfate                          | 103    | 5.0     |         | mg/l     | EPA 300.0/SW846 9056  |
| pH                               | 8.18   |         |         | su       | SM4500HB+ -2011/9040C |

**D50582-1B SG 31-32-CO RIVER**

|                        |       |     |  |        |                |
|------------------------|-------|-----|--|--------|----------------|
| Iron Reducing Bacteria | 9000  | 25  |  | CFU/ml | HACH IRB-BART  |
| Slime Forming Bacteria | 66500 | 500 |  | CFU/ml | HACH SLYM-BART |

**D50582-1F SG 31-32-CO RIVER**

|           |       |      |  |      |           |
|-----------|-------|------|--|------|-----------|
| Barium    | 62.5  | 10   |  | ug/l | EPA 200.7 |
| Calcium   | 59600 | 400  |  | ug/l | EPA 200.7 |
| Iron      | 25.4  | 10   |  | ug/l | EPA 200.7 |
| Magnesium | 11900 | 200  |  | ug/l | EPA 200.7 |
| Potassium | 3420  | 1000 |  | ug/l | EPA 200.7 |
| Sodium    | 82400 | 400  |  | ug/l | EPA 200.7 |
| Strontium | 549   | 5.0  |  | ug/l | EPA 200.7 |

**D50582-2 TRIP BLK #3 469425,469712**

No hits reported in this sample.

(a) Sample pH > 2 at time of analysis.

Sample Results

---

Report of Analysis

---

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-CO RIVER | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50582-1             | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water          | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846 8260B                 |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32      |                                |

| Run #  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 7V22786.D | 1  | 09/19/13 | JL | n/a       | n/a        | V7V1254          |
| 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 | 122%   |        | 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  
 RL = Reporting Limit

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> SG 31-32-CO RIVER | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50582-1             | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water          | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> RSK175 MOD                  |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32      |                                |

| Run #               | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---------------------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 <sup>a</sup> | FB09428.D | 1  | 09/18/13 | JS | n/a       | n/a        | GFB414           |
| Run #2              |           |    |          |    |           |            |                  |

| Run #  | Initial Volume | Headspace Volume | Volume Injected | Temperature |
|--------|----------------|------------------|-----------------|-------------|
| Run #1 | 39.0 ml        | 4.0 ml           | 500 ul          | 23.0 Deg. C |
| Run #2 |                |                  |                 |             |

### Methane, Ethane and Propane

| CAS No. | Compound | Result | RL      | MDL     | Units | Q |
|---------|----------|--------|---------|---------|-------|---|
| 74-82-8 | Methane  | 0.0017 | 0.00080 | 0.00040 | mg/l  |   |
| 74-84-0 | Ethane   | ND     | 0.0016  | 0.00080 | mg/l  |   |
| 74-98-6 | Propane  | ND     | 0.022   | 0.011   | mg/l  |   |

(a) Sample pH > 2 at time of analysis.

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit

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> SG 31-32-CO RIVER | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50582-1             | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water          | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846-8015B SW846 3510C     |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32      |                                |

| Run #  | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------|----|-----------|------------|------------------|
| Run #1 | FH013166.D | 1  | 09/19/13 | TU | 09/18/13  | OP8591     | GFH700           |
| 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%    |        | 20-140% |       |   |

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

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

4.1  
4

## Report of Analysis

**Client Sample ID:** SG 31-32-CO RIVER  
**Lab Sample ID:** D50582-1  
**Matrix:** AQ - Surface Water  
**Project:** WWLCOGJ: WPX SG 31-32

**Date Sampled:** 09/16/13  
**Date Received:** 09/17/13  
**Percent Solids:** n/a

## General Chemistry

| Analyte                                | Result   | RL     | Units    | DF | Analyzed       | By | Method                |
|--|----------|--------|----------|----|----------------|----|-----------------------|
| Alkalinity, Bicarbonate as CaC         | 113      | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Alkalinity, Carbonate                  | < 5.0    | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Alkalinity, Total as CaCO <sub>3</sub> | 113      | 5.0    | mg/l     | 1  | 09/23/13       | JD | SM 2320B-2011         |
| Bromide                                | < 0.050  | 0.050  | mg/l     | 1  | 09/17/13 15:21 | SK | EPA 300.0/SW846 9056  |
| Chloride                               | 120      | 5.0    | mg/l     | 10 | 09/17/13 19:02 | SK | EPA 300.0/SW846 9056  |
| Fluoride                               | 0.25     | 0.10   | mg/l     | 1  | 09/17/13 15:21 | SK | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrate                      | 0.19     | 0.010  | mg/l     | 1  | 09/17/13 15:21 | SK | EPA 300.0/SW846 9056  |
| Nitrogen, Nitrite                      | < 0.0040 | 0.0040 | mg/l     | 1  | 09/17/13 15:21 | SK | EPA 300.0/SW846 9056  |
| Phosphorus, Total                      | 1.4      | 0.050  | mg/l     | 5  | 09/24/13       | BF | HACH8190/SM4500P-B/E  |
| Solids, Total Dissolved                | 448      | 10     | mg/l     | 1  | 09/18/13       | RW | SM 2540C-2011         |
| Specific Conductivity                  | 744      | 1.0    | umhos/cm | 1  | 09/20/13       | RW | SM 2510B-2011         |
| Sulfate                                | 103      | 5.0    | mg/l     | 10 | 09/17/13 19:02 | SK | EPA 300.0/SW846 9056  |
| pH                                     | 8.18     |        | su       | 1  | 09/19/13 14:10 | KB | SM4500HB+ -2011/9040C |

RL = Reporting Limit

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> SG 31-32-CO RIVER | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50582-1B            | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Surface Water          | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32      |                                |

### General Chemistry

| Analyte                   | Result | RL  | Units  | DF | Analyzed | By | Method         |
|---------------------------|--------|-----|--------|----|----------|----|----------------|
| Iron Reducing Bacteria    | 9000   | 25  | CFU/ml | 1  | 09/23/13 | MM | HACH IRB-BART  |
| Slime Forming Bacteria    | 66500  | 500 | CFU/ml | 1  | 09/23/13 | MM | HACH SLYM-BART |
| Sulfate Reducing Bacteria | < 200  | 200 | CFU/ml | 1  | 09/23/13 | MM | HACH SRB-BART  |

RL = Reporting Limit

4.2  
 4

## Report of Analysis

|  |   |
|--|---|
| <b>Client Sample ID:</b> SG 31-32-CO RIVER<br><b>Lab Sample ID:</b> D50582-1F<br><b>Matrix:</b> AQ - Surface H2O Filtered<br><b>Project:</b> WWLCOGJ: WPX SG 31-32 | <b>Date Sampled:</b> 09/16/13<br><b>Date Received:</b> 09/17/13<br><b>Percent Solids:</b> n/a |
|--|---|

**Dissolved Metals Analysis**

| Analyte   | Result | RL   | Units | DF | Prep     | Analyzed By | Method                 | Prep Method            |
|-----------|--------|------|-------|----|----------|-------------|------------------------|------------------------|
| Barium    | 62.5   | 10   | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Boron     | < 50   | 50   | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Calcium   | 59600  | 400  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Iron      | 25.4   | 10   | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Magnesium | 11900  | 200  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Manganese | < 5.0  | 5.0  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Potassium | 3420   | 1000 | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Selenium  | < 0.80 | 0.80 | ug/l  | 2  | 09/19/13 | 09/20/13 JB | EPA 200.8 <sup>2</sup> | EPA 200.8 <sup>4</sup> |
| Sodium    | 82400  | 400  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |
| Strontium | 549    | 5.0  | ug/l  | 1  | 09/18/13 | 09/18/13 JB | EPA 200.7 <sup>1</sup> | EPA 200.7 <sup>3</sup> |

- (1) Instrument QC Batch: MA3980
- (2) Instrument QC Batch: MA3988
- (3) Prep QC Batch: MP11115
- (4) Prep QC Batch: MP11129

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RL = Reporting Limit

4.3  
4

## Report of Analysis

|  |                                |
|--|--------------------------------|
| <b>Client Sample ID:</b> TRIP BLK #3 469425,469712 | <b>Date Sampled:</b> 09/16/13  |
| <b>Lab Sample ID:</b> D50582-2                     | <b>Date Received:</b> 09/17/13 |
| <b>Matrix:</b> AQ - Trip Blank Water               | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> SW846 8260B                         |                                |
| <b>Project:</b> WWLCOGJ: WPX SG 31-32              |                                |

| Run #  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 7V22785.D | 1  | 09/19/13 | JL | n/a       | n/a        | V7V1254          |
| 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 | 119%   |        | 62-130% |
| 2037-26-5  | Toluene-D8            | 105%   |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 88%    |        | 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

4.4  
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: D50582

Client: WESTERN WATER & LAND INC.

Immediate Client Services Action Required: No

Date / Time Received: 9/17/2013 11:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: WPX SG 31-32

Airbill #'s: Fedex

| <u>Cooler Security</u>    | <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"/> |

| <u>Cooler Temperature</u>    | <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)                |

| <u>Quality Control Preservation</u> | <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"/> |

| <u>Sample Integrity - Documentation</u> | <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"/> |

| <u>Sample Integrity - Condition</u> | <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                   |

| <u>Sample Integrity - Instructions</u>    | <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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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:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V7V1254-MB | 7V22769.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

| 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 | 108%   | 62-130% |
| 2037-26-5  | Toluene-D8            | 98%    | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 83%    | 69-130% |

# Blank Spike Summary

**Job Number:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V7V1254-BS | 7V22770.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

| CAS No.   | Compound       | Spike<br>ug/l | BSP<br>ug/l | BSP<br>% | Limits |
|-----------|----------------|---------------|-------------|----------|--------|
| 71-43-2   | Benzene        | 50            | 46.0        | 92       | 70-130 |
| 100-41-4  | Ethylbenzene   | 50            | 51.1        | 102      | 70-130 |
| 108-88-3  | Toluene        | 50            | 50.8        | 102      | 70-130 |
| 1330-20-7 | Xylene (total) | 150           | 153         | 102      | 70-130 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101% | 62-130% |
| 2037-26-5  | Toluene-D8            | 105% | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 111% | 69-130% |

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V7V1254-BS | 7V22771.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

| CAS No. | Compound         | Spike<br>ug/l | BSP<br>ug/l | BSP<br>% | Limits |
|---------|------------------|---------------|-------------|----------|--------|
|         | TPH-GRO (C6-C10) | 2200          | 1970        | 90       | 39-144 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 107% | 62-130% |
| 2037-26-5  | Toluene-D8            | 100% | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 94%  | 69-130% |

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample                  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------------------|-----------|----|----------|----|-----------|------------|------------------|
| D48569-7MS <sup>a</sup> | 7V22772.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |
| D48569-7 <sup>a</sup>   | 7V22774.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

| CAS No.   | Compound       | D48569-7<br>ug/l | Spike<br>Q | ug/l | MS<br>ug/l | MS<br>% | Limits |
|-----------|----------------|------------------|------------|------|------------|---------|--------|
| 71-43-2   | Benzene        | ND               | 50         | 46.8 | 94         | 62-130  |        |
| 100-41-4  | Ethylbenzene   | ND               | 50         | 46.5 | 93         | 63-130  |        |
| 108-88-3  | Toluene        | ND               | 50         | 49.1 | 98         | 60-130  |        |
| 1330-20-7 | Xylene (total) | ND               | 150        | 145  | 97         | 67-130  |        |

| CAS No.    | Surrogate Recoveries  | MS   | D48569-7 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | 112%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 105% | 104%     | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 104% | 85%      | 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:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample                  | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------------------|-----------|----|----------|----|-----------|------------|------------------|
| D48569-7MS <sup>a</sup> | 7V22773.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |
| D48569-7 <sup>a</sup>   | 7V22774.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

| CAS No. | Compound         | D48569-7<br>ug/l | Spike<br>Q | ug/l | MS<br>ug/l | MS<br>% | Limits |
|---------|------------------|------------------|------------|------|------------|---------|--------|
|         | TPH-GRO (C6-C10) | ND               |            | 2200 | 2020       | 92      | 19-168 |

| CAS No.    | Surrogate Recoveries  | MS   | D48569-7 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98%  | 112%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 101% | 104%     | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 95%  | 85%      | 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:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D50581-1DUP | 7V22776.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |
| D50581-1    | 7V22775.D | 1  | 09/18/13 | JL | n/a       | n/a        | V7V1254          |

The QC reported here applies to the following samples:

Method: SW846 8260B

D50582-1, D50582-2

| CAS No.   | Compound         | D50581-1<br>ug/l | DUP<br>Q | DUP<br>ug/l | Q | RPD | Limits |
|-----------|------------------|------------------|----------|-------------|---|-----|--------|
| 71-43-2   | Benzene          | 1.4              |          | 1.4         |   | 0   | 30     |
| 100-41-4  | Ethylbenzene     | 3.8              |          | 3.7         |   | 3   | 30     |
| 108-88-3  | Toluene          | ND               |          | ND          |   | nc  | 30     |
| 1330-20-7 | Xylene (total)   | 25.2             |          | 24.6        |   | 2   | 30     |
|           | TPH-GRO (C6-C10) | 403              |          | 399         |   | 1   | 30     |

| CAS No.    | Surrogate Recoveries  | DUP  | D50581-1 | Limits  |
|------------|-----------------------|------|----------|---------|
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | 108%     | 62-130% |
| 2037-26-5  | Toluene-D8            | 99%  | 99%      | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 94%  | 96%      | 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:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| GFB414-MB | FB09426.D | 1  | 09/18/13 | JS | n/a       | n/a        | GFB414           |

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50582-1

| 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     | 0.022   | 0.011   | mg/l  |   |

7.1.1

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# Blank Spike Summary

**Job Number:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| GFB414-BS | FB09427.D | 10 | 09/18/13 | JS | n/a       | n/a        | GFB414           |

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50582-1

| CAS No. | Compound | Spike<br>mg/l | BSP<br>mg/l | BSP<br>% | Limits |
|---------|----------|---------------|-------------|----------|--------|
| 74-82-8 | Methane  | 0.51          | 0.501       | 98       | 70-130 |
| 74-84-0 | Ethane   | 0.956         | 0.751       | 79       | 70-130 |
| 74-98-6 | Propane  | 1.4           | 1.12        | 80       | 67-130 |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample                   | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------------------|-----------|----|----------|----|-----------|------------|------------------|
| D50582-1MS <sup>a</sup>  | FB09429.D | 10 | 09/18/13 | JS | n/a       | n/a        | GFB414           |
| D50582-1MSD <sup>a</sup> | FB09430.D | 10 | 09/18/13 | JS | n/a       | n/a        | GFB414           |
| D50582-1 <sup>a</sup>    | FB09428.D | 1  | 09/18/13 | JS | n/a       | n/a        | GFB414           |

The QC reported here applies to the following samples:

Method: RSK175 MOD

D50582-1

| CAS No. | Compound | D50582-1<br>mg/l | Spike<br>Q<br>mg/l | MS<br>mg/l | MS<br>% | MSD<br>mg/l | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|----------|------------------|--------------------|------------|---------|-------------|----------|-----|-------------------|
| 74-82-8 | Methane  | 0.0017           | 0.51               | 0.531      | 104     | 0.533       | 104      | 0   | 51-155/30         |
| 74-84-0 | Ethane   | ND               | 0.956              | 0.835      | 87      | 0.840       | 88       | 1   | 58-130/30         |
| 74-98-6 | Propane  | ND               | 1.4                | 1.32       | 94      | 1.34        | 96       | 2   | 46-130/30         |

(a) Sample pH > 2 at time of analysis.

\* = 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:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|------------|----|----------|----|-----------|------------|------------------|
| OP8591-MB | FH013122.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |

The QC reported here applies to the following samples:

Method: SW846-8015B

D50582-1

| 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          | 35% 20-140% |

# Blank Spike Summary

**Job Number:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample    | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|------------|----|----------|----|-----------|------------|------------------|
| OP8591-BS | FH013124.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |

The QC reported here applies to the following samples:

Method: SW846-8015B

D50582-1

| CAS No. | Compound          | Spike mg/l | BSP mg/l | BSP % | Limits |
|---------|-------------------|------------|----------|-------|--------|
|         | TPH-DRO (C10-C28) | 20         | 11.2     | 56    | 36-140 |

| CAS No. | Surrogate Recoveries | BSP | Limits  |
|---------|----------------------|-----|---------|
| 84-15-1 | o-Terphenyl          | 47% | 20-140% |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D50582  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** WWLCOGJ: WPX SG 31-32

| Sample     | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|------------|----|----------|----|-----------|------------|------------------|
| OP8591-MS  | FH013126.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |
| OP8591-MSD | FH013128.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |
| D48569-3   | FH013130.D | 1  | 09/18/13 | TU | 09/18/13  | OP8591     | GFH700           |

The QC reported here applies to the following samples:

Method: SW846-8015B

D50582-1

| CAS No. | Compound          | D48569-3<br>mg/l | Spike<br>Q<br>mg/l | MS<br>mg/l | MS<br>% | MSD<br>mg/l | MSD<br>% | RPD  | Limits<br>Rec/RPD |
|---------|-------------------|------------------|--------------------|------------|---------|-------------|----------|------|-------------------|
|         | TPH-DRO (C10-C28) | ND               | 20                 | 10.4       | 52      | 12.9        | 65       | 170* | 28-140/30         |

| CAS No. | Surrogate Recoveries | MS  | MSD | D48569-3 | Limits  |
|---------|----------------------|-----|-----|----------|---------|
| 84-15-1 | o-Terphenyl          | 61% | 73% | 51%      | 20-140% |

8.3.1  
8

\* = 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: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date: 09/18/13

| Metal      | RL   | IDL | MDL | MB<br>raw | final |
|------------|------|-----|-----|-----------|-------|
| Aluminum   | 100  | 8.6 | 11  |           |       |
| Antimony   | 30   | 3.2 | 21  |           |       |
| Arsenic    | 25   | 5.2 | 9   |           |       |
| Barium     | 10   | 1.4 | 1.4 | 1.5       | <10   |
| Beryllium  | 10   | .8  | 1.7 |           |       |
| Boron      | 50   | 6.7 | 6.6 | 4.4       | <50   |
| Cadmium    | 10   | .4  | .36 |           |       |
| Calcium    | 400  | 2.2 | 66  | 3.4       | <400  |
| Chromium   | 10   | .4  | 1.4 |           |       |
| Cobalt     | 5.0  | .4  | .51 |           |       |
| Copper     | 10   | 1.2 | 1.5 |           |       |
| Iron       | 10   | 2.2 | 3.2 | 1.4       | <10   |
| Lead       | 50   | 3.6 | 4.1 |           |       |
| Lithium    | 5.0  | 1.9 | 1.9 |           |       |
| Magnesium  | 200  | 14  | 29  | -3.8      | <200  |
| Manganese  | 5.0  | .01 | .29 | 0.0       | <5.0  |
| Molybdenum | 10   | .8  | 1.1 |           |       |
| Nickel     | 30   | .9  | .87 |           |       |
| Phosphorus | 100  | 15  | 24  |           |       |
| Potassium  | 1000 | 130 | 230 | 68.6      | <1000 |
| Selenium   | 50   | 8.8 | 9.3 |           |       |
| Silicon    | 50   | 5.2 | 5.6 |           |       |
| Silver     | 30   | .4  | .4  |           |       |
| Sodium     | 400  | 4.9 | 36  | 9.4       | <400  |
| Strontium  | 5.0  | .01 | .12 | 0.0       | <5.0  |
| Thallium   | 10   | 2.9 | 4.9 |           |       |
| Tin        | 50   | 13  | 13  |           |       |
| Titanium   | 10   | .15 | .43 |           |       |
| Uranium    | 50   | 3.7 | 3.9 |           |       |
| Vanadium   | 10   | .4  | .39 |           |       |
| Zinc       | 30   | .6  | 1.9 |           |       |

Associated samples MP11115: D50582-1F

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

9.1.1

9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | D50586-1A<br>Original MS |       | SpikeLot<br>ICPAL2 | % Rec | QC<br>Limits |
|------------|--------------------------|-------|--------------------|-------|--------------|
| Aluminum   |                          |       |                    |       |              |
| Antimony   |                          |       |                    |       |              |
| Arsenic    | anr                      |       |                    |       |              |
| Barium     | 41.7                     | 2050  | 2000               | 100.4 | 70-130       |
| Beryllium  |                          |       |                    |       |              |
| Boron      | 75.8                     | 1140  | 1000               | 106.4 | 70-130       |
| Cadmium    | anr                      |       |                    |       |              |
| Calcium    | 43500                    | 68800 | 25000              | 101.2 | 70-130       |
| Chromium   | anr                      |       |                    |       |              |
| Cobalt     |                          |       |                    |       |              |
| Copper     |                          |       |                    |       |              |
| Iron       | 214                      | 5010  | 5000               | 95.9  | 70-130       |
| Lead       | anr                      |       |                    |       |              |
| Lithium    |                          |       |                    |       |              |
| Magnesium  | 8070                     | 33500 | 25000              | 101.7 | 70-130       |
| Manganese  | 13.7                     | 529   | 500                | 103.1 | 70-130       |
| Molybdenum |                          |       |                    |       |              |
| Nickel     |                          |       |                    |       |              |
| Phosphorus |                          |       |                    |       |              |
| Potassium  | 1310                     | 29200 | 25000              | 111.6 | 70-130       |
| Selenium   | anr                      |       |                    |       |              |
| Silicon    |                          |       |                    |       |              |
| Silver     | anr                      |       |                    |       |              |
| Sodium     | 65400                    | 92800 | 25000              | 109.6 | 70-130       |
| Strontium  | 268                      | 780   | 500                | 102.4 | 70-130       |
| Thallium   |                          |       |                    |       |              |
| Tin        | anr                      |       |                    |       |              |
| Titanium   |                          |       |                    |       |              |
| Uranium    |                          |       |                    |       |              |
| Vanadium   |                          |       |                    |       |              |
| Zinc       |                          |       |                    |       |              |

Associated samples MP11115: D50582-1F

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

9.1.2  
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | D50586-1A<br>Original MSD |       | SpikeLot<br>ICPAL2 % Rec |       | MSD<br>RPD | QC<br>Limit |
|------------|---------------------------|-------|--------------------------|-------|------------|-------------|
| Aluminum   |                           |       |                          |       |            |             |
| Antimony   |                           |       |                          |       |            |             |
| Arsenic    | anr                       |       |                          |       |            |             |
| Barium     | 41.7                      | 2010  | 2000                     | 98.4  | 2.0        | 20          |
| Beryllium  |                           |       |                          |       |            |             |
| Boron      | 75.8                      | 1130  | 1000                     | 105.4 | 0.9        | 20          |
| Cadmium    | anr                       |       |                          |       |            |             |
| Calcium    | 43500                     | 67200 | 25000                    | 94.8  | 2.4        | 20          |
| Chromium   | anr                       |       |                          |       |            |             |
| Cobalt     |                           |       |                          |       |            |             |
| Copper     |                           |       |                          |       |            |             |
| Iron       | 214                       | 4950  | 5000                     | 94.7  | 1.2        | 20          |
| Lead       | anr                       |       |                          |       |            |             |
| Lithium    |                           |       |                          |       |            |             |
| Magnesium  | 8070                      | 33000 | 25000                    | 99.7  | 1.5        | 20          |
| Manganese  | 13.7                      | 523   | 500                      | 101.9 | 1.1        | 20          |
| Molybdenum |                           |       |                          |       |            |             |
| Nickel     |                           |       |                          |       |            |             |
| Phosphorus |                           |       |                          |       |            |             |
| Potassium  | 1310                      | 28600 | 25000                    | 109.2 | 2.1        | 20          |
| Selenium   | anr                       |       |                          |       |            |             |
| Silicon    |                           |       |                          |       |            |             |
| Silver     | anr                       |       |                          |       |            |             |
| Sodium     | 65400                     | 91200 | 25000                    | 103.2 | 1.7        | 20          |
| Strontium  | 268                       | 769   | 500                      | 100.2 | 1.4        | 20          |
| Thallium   |                           |       |                          |       |            |             |
| Tin        | anr                       |       |                          |       |            |             |
| Titanium   |                           |       |                          |       |            |             |
| Uranium    |                           |       |                          |       |            |             |
| Vanadium   |                           |       |                          |       |            |             |
| Zinc       |                           |       |                          |       |            |             |

Associated samples MP11115: D50582-1F

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

9.1.2  
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50582  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
 Matrix Type: AQUEOUS

Methods: EPA 200.7  
 Units: ug/l

Prep Date: 09/18/13

| Metal      | BSP Result | Spikelot ICPALL2 | % Rec | QC Limits |
|------------|------------|------------------|-------|-----------|
| Aluminum   |            |                  |       |           |
| Antimony   |            |                  |       |           |
| Arsenic    | anr        |                  |       |           |
| Barium     | 1950       | 2000             | 97.5  | 85-115    |
| Beryllium  |            |                  |       |           |
| Boron      | 1040       | 1000             | 104.0 | 85-115    |
| Cadmium    | anr        |                  |       |           |
| Calcium    | 25100      | 25000            | 100.4 | 85-115    |
| Chromium   | anr        |                  |       |           |
| Cobalt     |            |                  |       |           |
| Copper     |            |                  |       |           |
| Iron       | 4780       | 5000             | 95.6  | 85-115    |
| Lead       | anr        |                  |       |           |
| Lithium    |            |                  |       |           |
| Magnesium  | 24700      | 25000            | 98.8  | 85-115    |
| Manganese  | 512        | 500              | 102.4 | 85-115    |
| Molybdenum |            |                  |       |           |
| Nickel     |            |                  |       |           |
| Phosphorus |            |                  |       |           |
| Potassium  | 25700      | 25000            | 102.8 | 85-115    |
| Selenium   | anr        |                  |       |           |
| Silicon    |            |                  |       |           |
| Silver     | anr        |                  |       |           |
| Sodium     | 25600      | 25000            | 102.4 | 85-115    |
| Strontium  | 498        | 500              | 99.6  | 85-115    |
| Thallium   |            |                  |       |           |
| Tin        | anr        |                  |       |           |
| Titanium   |            |                  |       |           |
| Uranium    |            |                  |       |           |
| Vanadium   |            |                  |       |           |
| Zinc       |            |                  |       |           |

Associated samples MP11115: D50582-1F

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

9.1.3  
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11115  
Matrix Type: AQUEOUS

Methods: EPA 200.7  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129  
Matrix Type: AQUEOUS

Methods: EPA 200.8  
Units: ug/l

Prep Date: 09/19/13

| Metal      | RL   | IDL   | MDL  | MB<br>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  | 0.20      | <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 MP11129: D50582-1F

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

9.2.1  
9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 09/19/13

| Metal      | D50613-1F<br>Original MS | SpikeLot<br>ICPAL2 | % Rec | QC<br>Limits |
|------------|--------------------------|--------------------|-------|--------------|
| Aluminum   |                          |                    |       |              |
| Antimony   |                          |                    |       |              |
| Arsenic    | anr                      |                    |       |              |
| Barium     |                          |                    |       |              |
| Beryllium  |                          |                    |       |              |
| Boron      |                          |                    |       |              |
| Cadmium    | anr                      |                    |       |              |
| Calcium    |                          |                    |       |              |
| Chromium   | anr                      |                    |       |              |
| Cobalt     |                          |                    |       |              |
| Copper     | anr                      |                    |       |              |
| Iron       |                          |                    |       |              |
| Lead       | anr                      |                    |       |              |
| Magnesium  |                          |                    |       |              |
| Manganese  |                          |                    |       |              |
| Molybdenum | anr                      |                    |       |              |
| Nickel     | anr                      |                    |       |              |
| Phosphorus |                          |                    |       |              |
| Potassium  |                          |                    |       |              |
| Selenium   | 0.0                      | 196                | 200   | 98.0 70-130  |
| Silver     | anr                      |                    |       |              |
| Sodium     |                          |                    |       |              |
| Strontium  |                          |                    |       |              |
| Thallium   |                          |                    |       |              |
| Tin        |                          |                    |       |              |
| Titanium   |                          |                    |       |              |
| Uranium    |                          |                    |       |              |
| Vanadium   |                          |                    |       |              |
| Zinc       | anr                      |                    |       |              |

Associated samples MP11129: D50582-1F

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

9.2.2  
 9

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D50582  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 09/19/13

| Metal      | D50613-1F<br>Original MSD | SpikeLot<br>ICPAL2 | % Rec | MSD<br>RPD | QC<br>Limit |    |
|------------|---------------------------|--------------------|-------|------------|-------------|----|
| Aluminum   |                           |                    |       |            |             |    |
| Antimony   |                           |                    |       |            |             |    |
| Arsenic    | anr                       |                    |       |            |             |    |
| Barium     |                           |                    |       |            |             |    |
| Beryllium  |                           |                    |       |            |             |    |
| Boron      |                           |                    |       |            |             |    |
| Cadmium    | anr                       |                    |       |            |             |    |
| Calcium    |                           |                    |       |            |             |    |
| Chromium   | anr                       |                    |       |            |             |    |
| Cobalt     |                           |                    |       |            |             |    |
| Copper     | anr                       |                    |       |            |             |    |
| Iron       |                           |                    |       |            |             |    |
| Lead       | anr                       |                    |       |            |             |    |
| Magnesium  |                           |                    |       |            |             |    |
| Manganese  |                           |                    |       |            |             |    |
| Molybdenum | anr                       |                    |       |            |             |    |
| Nickel     | anr                       |                    |       |            |             |    |
| Phosphorus |                           |                    |       |            |             |    |
| Potassium  |                           |                    |       |            |             |    |
| Selenium   | 0.0                       | 190                | 200   | 95.0       | 3.1         | 20 |
| Silver     | anr                       |                    |       |            |             |    |
| Sodium     |                           |                    |       |            |             |    |
| Strontium  |                           |                    |       |            |             |    |
| Thallium   |                           |                    |       |            |             |    |
| Tin        |                           |                    |       |            |             |    |
| Titanium   |                           |                    |       |            |             |    |
| Uranium    |                           |                    |       |            |             |    |
| Vanadium   |                           |                    |       |            |             |    |
| Zinc       | anr                       |                    |       |            |             |    |

Associated samples MP11129: D50582-1F

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

9.2.2  
 9

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D50582  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: WWLCOGJ: WPX SG 31-32

QC Batch ID: MP11129  
 Matrix Type: AQUEOUS

Methods: EPA 200.8  
 Units: ug/l

Prep Date: 09/19/13

| Metal      | BSP Result | Spikelot ICPALL2 | % Rec | QC Limits |
|------------|------------|------------------|-------|-----------|
| Aluminum   |            |                  |       |           |
| Antimony   |            |                  |       |           |
| Arsenic    | anr        |                  |       |           |
| Barium     |            |                  |       |           |
| Beryllium  |            |                  |       |           |
| Boron      |            |                  |       |           |
| Cadmium    | anr        |                  |       |           |
| Calcium    |            |                  |       |           |
| Chromium   | anr        |                  |       |           |
| Cobalt     |            |                  |       |           |
| Copper     | anr        |                  |       |           |
| Iron       |            |                  |       |           |
| Lead       | anr        |                  |       |           |
| Magnesium  |            |                  |       |           |
| Manganese  |            |                  |       |           |
| Molybdenum | anr        |                  |       |           |
| Nickel     | anr        |                  |       |           |
| Phosphorus |            |                  |       |           |
| Potassium  |            |                  |       |           |
| Selenium   | 202        | 200              | 101.0 | 85-115    |
| Silver     | anr        |                  |       |           |
| Sodium     |            |                  |       |           |
| Strontium  |            |                  |       |           |
| Thallium   |            |                  |       |           |
| Tin        |            |                  |       |           |
| Titanium   |            |                  |       |           |
| Uranium    |            |                  |       |           |
| Vanadium   |            |                  |       |           |
| Zinc       | anr        |                  |       |           |

Associated samples MP11129: D50582-1F

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (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: D50582  
Account: WILLCOOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                        | Batch ID        | RL     | MB Result | Units    | Spike Amount | BSP Result | BSP %Recov | QC Limits   |
|--------------------------------|-----------------|--------|-----------|----------|--------------|------------|------------|-------------|
| Alkalinity, Bicarbonate as CaC | GN21996         | 5.0    | 2.0       | mg/l     | 100          | 95.0       | 94.9       | 90-110%     |
| Alkalinity, Carbonate          | GN21997         | 5.0    | 0.0       | mg/l     | 100          | 95.0       | 94.9       | 80-120%     |
| Alkalinity, Total as CaCO3     | GN21995         | 5.0    | 2.0       | mg/l     | 100          | 95.0       | 94.9       | 90-110%     |
| Bromide                        | GP10946/GN21930 | 0.050  | 0.0       | mg/l     | 20           | 19.7       | 98.5       | 90-110%     |
| Chloride                       | GP10946/GN21930 | 0.50   | 0.0       | mg/l     | 20           | 20.0       | 100.0      | 90-110%     |
| Fluoride                       | GP10946/GN21930 | 0.10   | 0.0       | mg/l     | 10           | 9.62       | 96.2       | 90-110%     |
| Iron Reducing Bacteria         | MB251           | 25     | <25       | CFU/ml   |              |            |            |             |
| Nitrogen, Nitrate              | GP10946/GN21930 | 0.010  | 0.0       | mg/l     | 4.52         | 4.44       | 98.3       | 90-110%     |
| Nitrogen, Nitrite              | GP10946/GN21930 | 0.0040 | 0.0       | mg/l     | 6.09         | 6.20       | 101.8      | 90-110%     |
| Phosphorus, Total              | GP11000/GN22026 | 0.010  | 0.0       | mg/l     | 0.304        | 0.33       | 109.2      | 80-120%     |
| Slime Forming Bacteria         | MB252           | 500    | <500      | CFU/ml   |              |            |            |             |
| Solids, Total Dissolved        | GN21944         | 10     | 0.0       | mg/l     | 400          | 395        | 98.8       | 90-110%     |
| Specific Conductivity          | GP10973/GN21980 |        |           | umhos/cm | 99.7         | 93.1       | 93.4       | 90-110%     |
| Sulfate                        | GP10946/GN21930 | 0.50   | 0.0       | mg/l     | 30           | 29.4       | 98.0       | 90-110%     |
| Sulfate Reducing Bacteria      | MB253           | 200    | <200      | CFU/ml   |              |            |            |             |
| pH                             | GN21969         |        |           | su       | 8.00         | 8.00       | 100.0      | 99.3-100.7% |

Associated Samples:

Batch MB251: D50582-1B  
Batch MB252: D50582-1B  
Batch MB253: D50582-1B  
Batch GN21944: D50582-1  
Batch GN21969: D50582-1  
Batch GN21995: D50582-1  
Batch GN21996: D50582-1  
Batch GN21997: D50582-1  
Batch GP10946: D50582-1  
Batch GP10973: D50582-1  
Batch GP11000: D50582-1

(\* ) Outside of QC limits

10.1  
10

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                    | Batch ID        | QC Sample | Units    | Original Result | DUP Result | RPD | QC Limits |
|----------------------------|-----------------|-----------|----------|-----------------|------------|-----|-----------|
| Alkalinity, Total as CaCO3 | GN21995         | D50545-1  | mg/l     | 169             | 167        | 1.0 | 0-20%     |
| Phosphorus, Total          | GP11000/GN22026 | D50441-1  | mg/l     | 0.065           | 0.067      | 3.0 | 0-20%     |
| Solids, Total Dissolved    | GN21944         | D50439-1  | mg/l     | 600             | 632        | 5.2 | 0-20%     |
| Specific Conductivity      | GP10973/GN21980 | D50582-1  | umhos/cm | 744             | 736        | 1.1 | 0-20%     |

Associated Samples:

Batch GN21944: D50582-1

Batch GN21995: D50582-1

Batch GP10973: D50582-1

Batch GP11000: D50582-1

(\*) Outside of QC limits

10.2  
10

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50582  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                    | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec  | QC Limits |
|----------------------------|-----------------|-----------|-------|-----------------|--------------|-----------|-------|-----------|
| Alkalinity, Total as CaCO3 | GN21995         | D50545-1  | mg/l  | 169             | 100          | 261       | 92.1  | 80-120%   |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 2.5          | 2.6       | 104.0 | 80-120%   |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.054           | 2.5          | 2.6       | 104.0 | 80-120%   |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 36.3            | 500          | 525       | 95.8  | 80-120%   |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 46.2            | 500          | 525       | 95.8  | 80-120%   |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 3.2             | 2.5          | 2.9       | 105.6 | 80-120%   |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 0.26            | 2.5          | 2.9       | 105.6 | 80-120%   |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 13.2            | 28.3         | 42.4      | 103.4 | 80-120%   |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 17.6            | 28.3         | 42.4      | 103.4 | 80-120%   |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0084          | 0.305        | 0.32      | 102.3 | 80-120%   |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 0.305        | 0.32      | 102.3 | 80-120%   |
| Phosphorus, Total          | GP11000/GN22026 | D50441-1  | mg/l  | 0.065           | 0.40         | 0.42      | 88.8  | 80-120%   |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 19.5            | 10           | 24.8      | 108.3 | 80-120%   |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 14.0            | 10           | 24.8      | 108.3 | 80-120%   |

Associated Samples:

Batch GN21995: D50582-1

Batch GP10946: D50582-1

Batch GP11000: D50582-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.3  
10

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D50582  
Account: WILLCOB - WPX Energy Rocky Mountain, LLC  
Project: WWLCOGJ: WPX SG 31-32

| Analyte                    | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MSD Result | RPD | QC Limit |
|----------------------------|-----------------|-----------|-------|-----------------|--------------|------------|-----|----------|
| Alkalinity, Total as CaCO3 | GN21995         | D50545-1  | mg/l  | 169             | 100          | 261        | 0.1 | 20%      |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 2.5          | 2.6        | 0.0 | 20%      |
| Bromide                    | GP10946/GN21930 | D50578-2  | mg/l  | 0.054           | 2.5          | 2.6        | 0.0 | 20%      |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 36.3            | 500          | 516        | 1.7 | 20%      |
| Chloride                   | GP10946/GN21930 | D50578-2  | mg/l  | 46.2            | 500          | 516        | 1.7 | 20%      |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 3.2             | 2.5          | 2.9        | 0.0 | 20%      |
| Fluoride                   | GP10946/GN21930 | D50578-2  | mg/l  | 0.26            | 2.5          | 2.9        | 0.0 | 20%      |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 13.2            | 28.3         | 42.0       | 0.9 | 20%      |
| Nitrogen, Nitrate          | GP10946/GN21930 | D50578-2  | mg/l  | 17.6            | 28.3         | 42.0       | 0.9 | 20%      |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0084          | 0.305        | 0.31       | 3.2 | 20%      |
| Nitrogen, Nitrite          | GP10946/GN21930 | D50578-2  | mg/l  | 0.0             | 0.305        | 0.31       | 3.2 | 20%      |
| Phosphorus, Total          | GP11000/GN22026 | D50441-1  | mg/l  | 0.065           | 0.40         | 0.420      | 0.0 | 20%      |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 19.5            | 10           | 24.8       | 0.0 | 20%      |
| Sulfate                    | GP10946/GN21930 | D50578-2  | mg/l  | 14.0            | 10           | 24.8       | 0.0 | 20%      |

Associated Samples:

Batch GN21995: D50582-1

Batch GP10946: D50582-1

Batch GP11000: D50582-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

10.4  
10