



August 16, 2013

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

**RE: GM 32-4 Drill Pad Pit Baseline Results Report, June 2013 Event**

Dear Mr. Danforth,

Western Water & Land, Inc. (WWL) has completed the initial baseline water sampling for the WPX Energy Rocky Mountain LLC (WPX) GM 32-4 drill pad in accordance with COGCC Condition of Approval 22 (COA 22) and Rule 609.

In accordance with COA 22 and Rule 609, the evaluation considered all water sources (domestic wells or springs) within a 0.5-mile radius of the referenced drill pad (oil and gas location). A preliminary screening of the groundwater sources was completed to identify the sources that are potentially available for sampling pending the consent of the structure owners. Each potentially available water source was then evaluated to identify the preferred sources for the baseline program. If the number of potentially available sources was four or less, all of the sources were included in the list of preferred sources. If more than four sources were potentially available, the sources were prioritized based on WWL's hydrologic expertise and in accordance with COA 22 and Rule 609. A complete description of the water source evaluation process and results are provided in the water source evaluation report (Baseline Water Quality Sampling Evaluation – GM 32-4 Drill Pad, April 24, 2013).

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

**FIELD SAMPLING ACTIVITIES**

As described in the Baseline Water Quality Sampling Evaluation – GM 32-4 Drill Pad, April 24, 2013, four sampling locations were identified for field sampling of water quality consistent with requirements of COA 22 1) Spring G-7960406-1; 2) Spring G-7960406-2; 3) Spring G-7960406-3; and 4) Spring G-7960410-1. According to state records, the Bureau of Land Management (BLM) holds the water rights to these springs. The BLM was contacted and granted WPX permission to sample these springs.

Three WWL sampling personnel conducted broad field reconnaissance to locate the spring sites. The area was characterized by piñon-juniper and Gambel oak plant communities and numerous escarpments from slumps on the north-facing slopes. No spring sites were located, and therefore, no springs were sampled. No substituted preferred sites were identified in the evaluation and therefore no groundwater sources were sampled for this drill pad.

COA 22 required that surface water flow within Riley Gulch, if present, be sampled upgradient and downgradient of the GM 32-4 pad. Flow was present in Riley Gulch and both the upgradient and downgradient sampling locations were selected and sampled. See Figure 1 for the sampled locations. Sampled locations were field-staked using a 4-foot long, green, metal stake identified with a metal tag with the sample ID, and orange flagging. The sampling event was conducted on June 11<sup>th</sup>, 2013. Photographs of the sampling sites are shown in Attachment A.

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 (ALS Laboratory, Fort Collins, 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), total dissolved solids (calculated/measured ratio), and assigned additional qualifiers to analytical results as necessary.

### **Field Procedures**

WWL conducted field sampling procedures in accordance with the COGCC Model SAP. Sampling at both GM32-4-RGUP1 (Riley Gulch upgradient site) and GM32-4-RGDWN1 (Riley Gulch downgradient site) were 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 on the COC matched the requirements of COA 22. DRO (diesel range organics) and GRO (gasoline range organics) were designated on the COC in place of TPH, a required analysis for COA 22. No other errors or pertinent information was observed, and no corrections were needed.

### **Sample Receipt**

The samples were received in a single cooler within the temperature range criteria ( $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ). Custody seals were intact. The lab reported on the sample receipt form that the Isotech™ bottle was received in the upright rather than upside down position. No qualifiers were assigned to results based on sample receipt conditions.

### **Holding Times**

All analyses were conducted within recommended holding times.

### **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 the following modifications: Total phosphorous was analyzed using Method 365.2. Gasoline Range Organics (TPH volatiles) were analyzed using Method SW8260\_25 Revision C. Diesel Range Organics (TPH extractables) were analyzed according to SW846 8000C and 8015D.

### **Detection Limits**

Detection limits provided with the analytical results were compared to the original quoted detection limits from the analytical laboratory. Detection limits were as quoted with no deviations observed except as applied to increased dilution factors. Chloride and sulfate and all the analyzed metals had dilution factors of 10 for both samples GM 32-4 RG UP 1 and GM 32-4 RG DWN1. ALS reports samples at the detection limit as “undetected” or “U” rather than reporting results as less than the detection reporting limit, e.g. < 0.05ug/L.

### **Completeness**

Data completeness is a measure of requested analysis and received results. The analytical constituents required under COA 22 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 22. 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 percent, 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 10 percent, and may assign a qualifier for CAB percentages between 5 and less than 10 percent. The CAB calculation for sample GM 32-4 RG UP 1 and GM 32-4 RG DWN 1 showed results of 0.62 and 3.49 percent, respectively (see Attachment B, Data Quality Review Sheet). The analytical results for cations and anions for the samples were not qualified

### **TDS**

The ratio of laboratory-measured TDS versus calculated TDS were computed and ratios greater than 1.20 for a sample are cause for a review of major ion reporting errors. No sample results were rejected on the basis of the TDS ratio.

In general, WWL will assign a qualifier (an estimated result) when TDS ratios are 1.5 or greater, and may assign a qualifier for TDS ratios between 1.2 and less than 1.5. The TDS calculation for sample samples GM 32-4 RG UP 1 and GM 32-4 RG DWN 1 showed ratios of 1.09 percent and 1.05 percent, respectively. 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 percent. No field duplicates were collected for this sampling event, therefore no field duplicate RPDs were calculated.

### **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 with the exception of the following:

- Surrogate recovery for O-terphenyl in the Method Blank (MB), Lab Control Sample (LCS) and Lab Control Sample Duplicate (LCSD) exceeded the upper control limit by 5%, 3% and 5%, respectively. Because all spike recoveries were within limits and the samples had undetected results, no further action was taken, and no qualifier was assigned.

#### **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.

#### **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. No qualifiers were assigned by the laboratory because of RPD values exceeding the laboratory acceptance criteria. Data Quality Review Sheets are presented in Attachment B.

#### **Summary**

ALS Laboratories assigned analytical results that were undetected with a "U" qualifier. No other quality control qualifiers were assigned to the analytical results by ALS Laboratories and WWL. See Attachment C for individual parameters that were qualified.

#### **ANALYTICAL RESULTS**

Laboratory analysis was performed by ALS Environmental (ALS), in Fort Collins, Colorado, in accordance with the analytical schedule described in COA 22. The analytical results are summarized in Attachment C; the data are qualified as indicated.

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

Sincerely,



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

#### Attachments

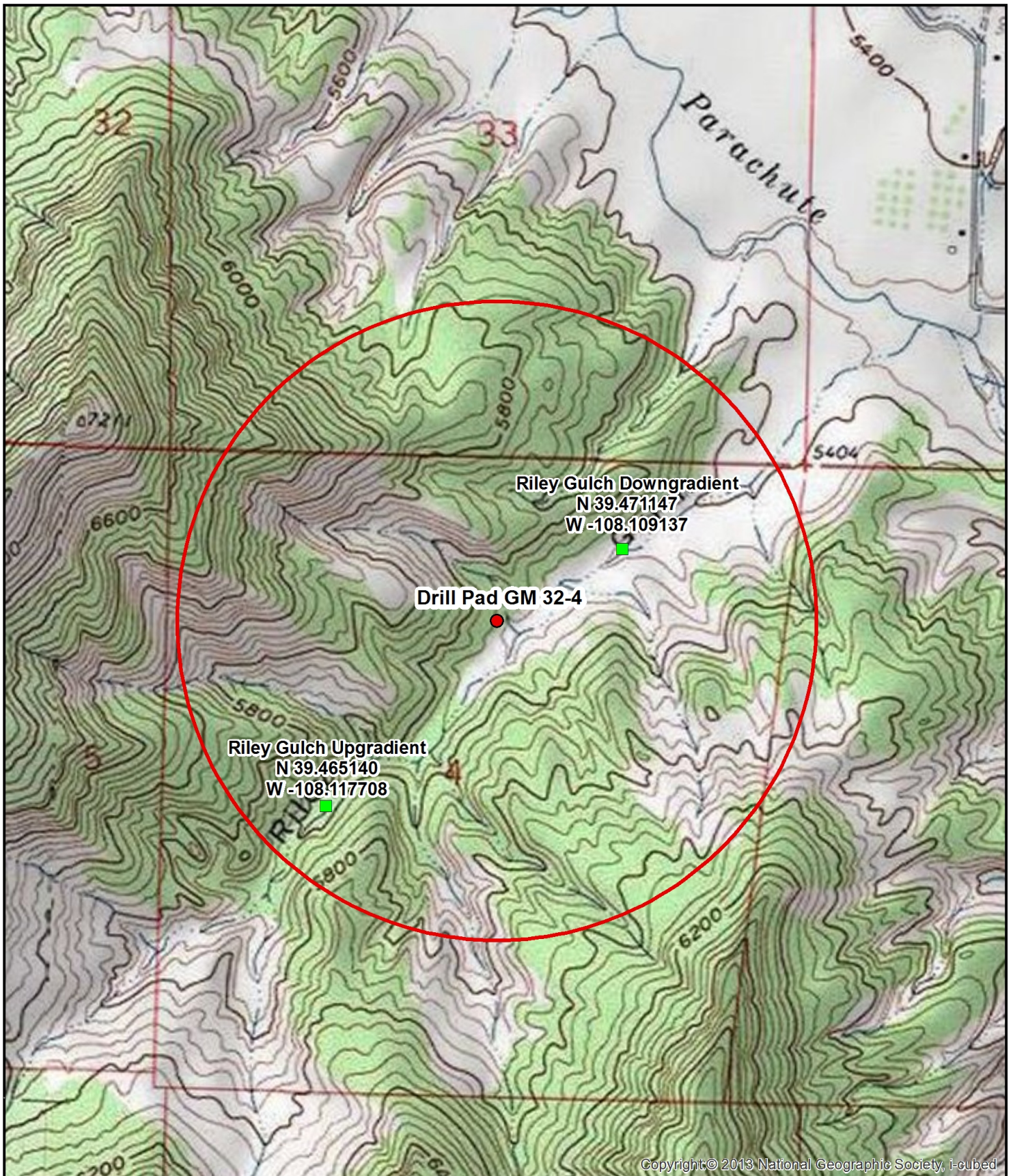
Figure 1- Sampling Location Map

Attachment A - Photographs

Attachment B - Data Quality Review Sheets

Attachment C – Summary of Analytical Results





#### Legend

- Sample Location(s)
- Well GM 32-4
- 0.5-Mile Radius Evaluation Area



Feet  
1,000 500 0 1,000  
1:13,000

**Figure 1: Drill Pad Location GM 32-4**  
**0.5 Mile Radius Water Source Evaluation**  
**SE1/4, NW1/4, S4, T7S, R96W, 6 PM**

Garfield County, Colorado  
 WPX Energy Rocky Mountain LLC  
 Basemap Source: Esri ArcGIS Online



Western Water & Land, Inc.  
 Applications in Earth Science

**ATTACHMENT A**

**Photographs**





**Photo 1. Riley Gulch Downgradient Sampling Location (GM 32-4-RG DWN 1); View Upstream**



**Photo 2. Riley Gulch Downgradient of Sampling Location (GM 32-4-RG DWN 1);  
View Downstream**





**Photo 3. Riley Gulch Upgradient Sampling Location (GM 32-4-RG UP 1)**

**ATTACHMENT B**

**Data Quality Review Sheets**

## DATA QUALITY REVIEW SHEET

Facility ID:	752703	Project:	GM 32-4 BWQ
Station Name:	Federal NESW S4 7S 96W	Lab Work Order:	1306160
Sample Date:	6/11/13	QA/QC Review Date:	8/14/2013
Field Sample ID:	GM 32-4-RG UP 1	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"/>
<b>Lab Data Report Review</b>			
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Lab qualifiers for data (other than undetected)? <i>List in comments.</i>	<input type="checkbox"/>	<input checked="" 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>		

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	0.62	N/A	N/A	±5%	<input checked="" type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	979	900	1.09	0.9 – 1.1	<input checked="" type="checkbox"/>
Specific Conductance, µS/cm (SpC)	1343	1310	1.03	0.9 – 1.1	<input checked="" type="checkbox"/>

**Comments:**

Isotech bottles were received in an upright position. Surrogate recovery for O-terphenyl in the Method Blank (MB), Lab Control Sample (LCS) and Lab Control Sample Duplicate (LCSD) exceeded the upper control limit by 5%, 3% and 5%, respectively. Because all spike recoveries were within limits and the samples were non-detect, no further action was taken, and no qualifier was assigned.

Some slight modifications were made in analytical methods that are different than methods indicated in the SAP.

## DATA QUALITY REVIEW SHEET

Facility ID:	752702	Project:	GM 32-4 BWQ
Station Name:	Federal NWNE S4 7S 96W	Lab Work Order:	1306160
Sample Date:	6/11/13	QA/QC Review Date:	8/14/13
Field Sample ID:	GM 32-4-RG DWN 1	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"/>
<b>Lab Data Report Review</b>			
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. All samples analyzed for the requested analyses?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Proper laboratory methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. All sample holding times met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Lab qualifiers for data (other than undetected)? <i>List in comments.</i>	<input type="checkbox"/>	<input checked="" 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>		

Calculated Parameters	Calculated Value	Lab Value	Ratio/Percent Difference	Acceptable Limit	Meets QC Criteria?
Cation/Anion Balance, % (CAB)	3.49	N/A	N/A	±5%	<input checked="" type="checkbox"/>
Total Dissolved Solids, mg/L (TDS)	928	880	1.05	0.9 – 1.1	<input checked="" type="checkbox"/>
Specific Conductance, µS/cm (SpC)	1313	1360	0.97	0.9 – 1.1	<input checked="" type="checkbox"/>

**Comments:**

Isotech bottles were received in an upright position. Surrogate recovery for O-terphenyl in the Method Blank (MB), Lab Control Sample (LCS) and Lab Control Sample Duplicate (LCSD) exceeded the upper control limit by 5%, 3% and 5%, respectively. Because all spike recoveries were within limits and the samples were non-detect, no further action was taken, and no qualifier was assigned.

Some slight modifications were made in analytical methods that are different than methods indicated in the SAP.



**ATTACHMENT C**

**Laboratory Analytical Results**

### GM 32-4 BWQ Analytical Results Summary

Station Name			Federal NESW S4 7S 96W						Federal NWNE S4 7S 96W						Trip Blank					
Field Sample ID			GM 32-4 RG UP 1						GM 32-4 RG DWN 1											
COGCC Facility ID			752703						752702						752703					
Sample Date			6/11/2013						6/11/2013						6/11/2013					
Lab Sample ID			1306160-1						1306160-2						1306160-3					
	Reporting Units	Analytic Method	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF	Result	Lab Qual	WWL Qual	RL	MDL	DF
<b>Bacteria</b>																				
Iron Related Bacteria <sup>1</sup>	nu	BART	1					1	1					1						
Slime Forming Bacteria <sup>1</sup>	nu	BART	1					1	1					1						
Sulfate Reducing Bacteria <sup>1</sup>	nu	BART	1					1	1					1						
<b>Dissolved gases</b>																				
Ethane	ug/l	RSK175	2	U		2	2	1	2	U		2	2	1						
Methane	ug/l	RSK175	1	U		1	1	1	1	U		1	1	1						
Propane	ug/l	RSK175	1	U		1	1	1	1	U		1	1	1						
<b>Inorganics</b>																				
Bicarbonate as CaCO3	mg/l	SM2320B	340			20		1	300			20		1						
Bromide	mg/l	EPA300.0	0.2	U		0.2	0.06	1	0.2	U		0.2	0.06	1						
Carbonate as CaCO3	mg/l	SM2320B	20	U		20		1	36			20		1						
Chloride	mg/l	EPA300.0	21			2	0.6	10	20			2	0.6	10						
Fluoride	mg/l	EPA300.0	0.59			0.1	0.03	1	0.56			0.1	0.03	1						
Nitrate as N	mg/l	EPA300.0	0.28			0.2	0.06	1	0.24			0.2	0.06	1						
Nitrite as N	mg/l	EPA300.0	0.1	U		0.1	0.03	1	0.1	U		0.1	0.03	1						
pH	s.u.	SM4500-H	8.39			0.1		1	8.49			0.1		1						
Specific Conductivity	umhos/cm	SM2510B	1310			1		1	1360			1		1						
Sulfate	mg/l	EPA300.0	350			10	3	10	340			10	3	10						
Total Alkalinity AS CaCO3	mg/l	SM2320B	340			20		1	340			20		1						
Total Dissolved Solids	mg/l	SM2540C	900			20		1	880			20		1						
Total Phosphorous	mg/l	EPA365.2	0.05	U		0.05	0.015	1	0.05	U		0.05	0.015	1						

GM 32-4 BWQ Analytical Results Summary																				
Station Name			Federal NESW S4 7S 96W						Federal NWNE S4 7S 96W						Trip Blank					
Field Sample ID			GM 32-4 RG UP 1						GM 32-4 RG DWN 1											
COGCC Facility ID			752703						752702						752703					
Sample Date			6/11/2013						6/11/2013						6/11/2013					
Lab Sample ID			1306160-1						1306160-2						1306160-3					
	Reporting Units	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
Metals																				
Barium	ug/l	EPA200.8	26			1	0.3	10	30			1	0.3	10						
Boron	ug/l	EPA200.8	160			50	15	10	170			50	15	10						
Calcium	ug/l	EPA200.8	55000			1000	65	10	51000			1000	65	10						
Iron (Ferric)	ug/l	EPA200.8	100	U		100	30	10	100	U		100	30	10						
Magnesium	ug/l	EPA200.8	68000			100	30	10	72000			100	30	10						
Manganese	ug/l	EPA200.8	2.6	U		2	0.6	10	2	U		2	0.6	10						
Potassium	ug/l	EPA200.8	2800			1000	300	10	2900			1000	300	10						
Selenium	ug/l	EPA200.8	2.5			1	0.5	10	1.8			1	0.5	10						
Sodium	ug/l	EPA200.8	140000			1000	300	10	140000			1000	300	10						
Strontium	ug/l	EPA200.8	1300			1	0.3	10	1300			1	0.3	10						
Organics																				
Diesel Range Organics	mg/l	SW8015M	0.5	U		0.5	0.15	1	0.5	U		0.5	0.15	1						
Gasoline Range Organics	ug/l	SW8260_25	100	U		100		1	100	U		100		1	100	U		100		1
VOAs																				
Benzene	ug/l	SW8260_25	1	U		1	0.3	1	1	U		1	0.3	1	1	U		1	0.3	1
Ethylbenzene	ug/l	SW8260_25	1	U		1	0.3	1	1	U		1	0.3	1	1	U		1	0.3	1
M+P-Xylene	ug/l	SW8260_25	1	U		1	0.3	1	1	U		1	0.3	1	1	U		1	0.3	1
o-Xylene	ug/l	SW8260_25	1	U		1	0.3	1	1	U		1	0.3	1	1	U		1	0.3	1
Toluene	ug/l	SW8260_25	1	U		1	0.3	1	1	U		1	0.3	1	1	U		1	0.3	1

GM 32-4 BWQ Analytical Results Summary																				
Station Name			Federal NESW S4 7S 96W						Federal NWNE S4 7S 96W						Trip Blank					
Field Sample ID			GM 32-4 RG UP 1						GM 32-4 RG DWN 1											
COGCC Facility ID			752703						752702						752703					
Sample Date			6/11/2013						6/11/2013						6/11/2013					
Lab Sample ID			1306160-1						1306160-2						1306160-3					
	Reporting Units	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
Field Param																				
Color	None	Field	Brown						Brown											
Conductivity, Field	uS/cm	Field	1061						1084											
Discharge	gpm	Field	37.7						37.8											
Dissolved Oxygen, Field	mg/l	Field	8.63						8.51											
Dissolved Oxygen, Field,%	%	Field	85.9						87.3											
Effervescence	None	Field	None						None											
H2S, Field	mg/l	Field	NM						NM											
Odor	None	Field	None						None											
ORP, field	mv	Field	NM						153											
pH, Field	s.u.	Field	8.49						8.51											
Specific Conductivity, Field	uS/cm	Field	1312						1297											
Temperature, Water	Deg C	Field	14.9						16.3											
Turbidity, field	NTUs	Field	19.72						12.23											

Notes:

U = not detected at the reporting limit

NM = not measured

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





**1306160**

**GC/MS Volatiles:**

The samples were analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C. The samples were also analyzed for Gasoline Range Organics (GRO).

All acceptance criteria were met.

**Dissolved Gasses:**

The samples were prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

All acceptance criteria were met.

**DRO:**

The samples were analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

All surrogate recoveries were within acceptable limits with the following exceptions:

Surrogate	Sample	Direction
O-terphenyl	MB and LCS/LCSD	High

The MB was below the MDL and the LCS/LCSD passed criteria. No further action was taken.

**BART:**

The Biological Activity Reaction Test was completed with the Iron-Related Bacteria, Sulfate-Reducing Bacteria, and Slime-Forming Bacteria kit manufactured by Hach Company. The analysis was performed following the manufacturer provided instructions. If the target analyte is not detected (absent), then the sample will be reported with "ND" in the result field and a "U" flag. If the target analyte is detected (present), then the sample will be reported with a "1" for a result without a flag.

**Metals:**

The samples were analyzed following Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures. Analysis by ICPMS followed method 200.8 and the current revision of SOP 827.

The samples were to be analyzed for dissolved metals. The samples were filtered through a 0.45 micron filter and preserved with nitric acid to a pH less than two prior to analysis.

All acceptance criteria were met.

**Inorganics:**

The samples were analyzed following MCAWW, EMSL, Standard Method procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Alkalinity	SM2320B	1106
Bicarbonate	SM2320B	1106
Carbonate	SM2320B	1106
pH	SM4500-H <sup>+</sup> B	1126
Total phosphorus	365.2	1119
Specific conductance	SM2510B	1128
TDS	SM2540C	1101
Bromide	300.0 Revision 2.1	1113
Chloride	300.0 Revision 2.1	1113
Fluoride	300.0 Revision 2.1	1113
Nitrate as N	300.0 Revision 2.1	1113
Nitrite as N	300.0 Revision 2.1	1113
Sulfate	300.0 Revision 2.1	1113

All acceptance criteria were met.

# ALS Environmental -- FC

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 1306160

**Client Name:** Western Water and Land, Inc.

**Client Project Name:** WPX Baseline Water Quality

**Client Project Number:** 30000.01.02

**Client PO Number:**

---

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
GM 32-4 RG UP 1	1306160-1		WATER	11-Jun-13	10:30
GM 32-4 RG DWN 1	1306160-2		WATER	11-Jun-13	9:15
Trip Blank	1306160-3		WATER	11-Jun-13	



225 Commerce Drive, Fort Collins, Colorado 80524  
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

## Chain-of-Custody

Form 202r8

[illegible]

\*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

**For metals or anions, please detail analytes below.**

Comments:		QC PACKAGE (check below)	
Dissolved metals need to be laboratory filtered. of 23		LEVEL II (Standard QC)	
		LEVEL III (Std QC + forms)	
		LEVEL IV (Std QC + forms + raw data)	<input checked="" type="checkbox"/>
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035			

RELINQUISHED BY	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	<i>J. Good</i>	Shelby Goodwin	6-11-13	1500
RECEIVED BY	<i>C. Trumble</i>	C Trumble	6-12-13	1020
RELINQUISHED BY				
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				

of 23





ALS Environmental - Fort Collins  
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Western Water

Workorder No: 1306160

Project Manager: AW

Initials: CDT Date: 6-12-13

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	NONE	<u>YES</u>	NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<u>YES</u>	NO
5. Are the COC and bottle labels complete and legible?		<u>YES</u>	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<u>YES</u>	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<u>YES</u>	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u>	NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u>	NO
10. Is there sufficient sample for the requested analyses?		<u>YES</u>	NO
11. Were all samples placed in the proper containers for the requested analyses?		<u>YES</u>	NO
12. Are all samples within holding times for the requested analyses?		<u>YES</u>	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<u>YES</u>	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	N/A	<u>YES</u>	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	<u>NO</u>
16. Were the samples shipped on ice?		<u>YES</u>	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 <u>#4</u>	RAD ONLY	<u>YES</u>	NO
Cooler #: <u>1</u>			
Temperature (°C): <u>5.6</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>13</u>			
Background µR/hr reading: <u>13</u>			
<div style="border: 1px solid black; padding: 2px;">DOT Survey/ Acceptance Information</div>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)			

**Additional Information:** PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Isotech bottles received in upright position

If applicable, was the client contacted? YES / NO / NA Contact: Bruce Smith

Date/Time: 6/15/13  
e-mail

Project Manager Signature / Date: [Signature] 6/15/13

WATER & LAND INC  
743 HORIZON CT STE 330  
GRAND JUNCTION CO 81506  
US

SHIP DATE: 11JUN13  
ACTWGT: 47.5 LB  
CAD: 9622/POS1400  
DIMMED: 24 X 14 X 14 IN  
BILL 3rd PARTY

TO AMY WOLF  
ALS ENVIRONMENTAL  
225 COMMERCE DR

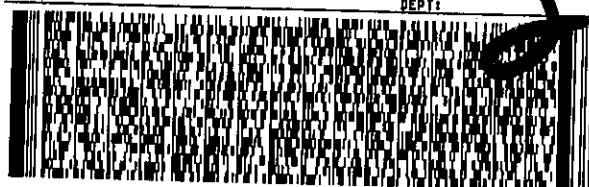
1306160  
13

FORT COLLINS CO 80524

(970) 490-1522

REF:

(US)



FedEx  
Ground



J13111302120126

TRK# 7957 8875 6362

S.6

80524

9622 0417 3 (000 045 7800) 7 00 7957 8875 6362



## ALS Environmental -- FC

## SAMPLE SUMMARY REPORT

Client: Western Water and Land, Inc.  
 Project: 30000.01.02 WPX Baseline Water Quality  
 Sample ID: GM 32-4 RG UP 1  
 Legal Location:  
 Collection Date: 6/11/2013 10:30

Date: 02-Aug-13  
 Work Order: 1306160  
 Lab ID: 1306160-1  
 Matrix: WATER  
 Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>ALKALINITY AS CALCIUM CARBONATE</b>						
			<b>SM2320B</b>		Prep Date: 6/18/2013	PrepBy: AJD
BICARBONATE AS CaCO3	340		20	MG/L	1	6/18/2013
CARBONATE AS CaCO3	ND		20	MG/L	1	6/18/2013
TOTAL ALKALINITY AS CaCO3	340		20	MG/L	1	6/18/2013
<b>BIOLOGICAL ACTIVITY REACTION TEST</b>						
			<b>BART</b>		Prep Date: 6/14/2013	PrepBy: BAS
IRON RELATED BACTERIA	1			NU	1	6/23/2013
SLIME FORMING BACTERIA	1			NU	1	6/23/2013
SULFATE REDUCING BACTERIA	1			NU	1	6/23/2013
<b>DIESEL RANGE ORGANICS</b>						
			<b>SW8015M</b>		Prep Date: 6/14/2013	PrepBy: JAC
Diesel Range Organics	ND		0.5	MG/L	1	6/14/2013 20:07
Surr: O-TERPHENYL	88		51-97	%REC	1	6/14/2013 20:07
<b>DISSOLVED GASSES</b>						
			<b>RSK175</b>		Prep Date: 6/13/2013	PrepBy: DMS
METHANE	ND		1	UG/L	1	6/13/2013 11:38
ETHANE	ND		2	UG/L	1	6/13/2013 11:38
PROPANE	ND		1	UG/L	1	6/13/2013 11:38
<b>GC/MS VOLATILES</b>						
			<b>SW8260_25</b>		Prep Date: 6/14/2013	PrepBy: SDW
BENZENE	ND		1	UG/L	1	6/14/2013 14:45
TOLUENE	ND		1	UG/L	1	6/14/2013 14:45
ETHYLBENZENE	ND		1	UG/L	1	6/14/2013 14:45
M+P-XYLENE	ND		1	UG/L	1	6/14/2013 14:45
O-XYLENE	ND		1	UG/L	1	6/14/2013 14:45
GASOLINE RANGE ORGANICS	ND		100	UG/L	1	6/14/2013 14:45
Surr: DIBROMOFLUOROMETHANE	100		84-118	%REC	1	6/14/2013 14:45
Surr: TOLUENE-D8	98		85-115	%REC	1	6/14/2013 14:45
Surr: 4-BROMOFLUOROBENZENE	98		85-115	%REC	1	6/14/2013 14:45
<b>ION CHROMATOGRAPHY</b>						
			<b>EPA300.0</b>		Prep Date: 6/12/2013	PrepBy: AJD
BROMIDE	ND		0.2	MG/L	1	6/12/2013 15:37
CHLORIDE	21		2	MG/L	10	6/12/2013 16:19
FLUORIDE	0.59		0.1	MG/L	1	6/12/2013 15:37
NITRATE AS N	0.28		0.2	MG/L	1	6/12/2013 15:37
NITRITE AS N	ND		0.1	MG/L	1	6/12/2013 15:37
SULFATE	350		10	MG/L	10	6/12/2013 16:19
<b>METALS BY 200.8</b>						
			<b>EPA200.8</b>		Prep Date: 6/20/2013	PrepBy: BAS
BORON	160		50	UG/L	10	6/24/2013 12:59
BARIUM	26		1	UG/L	10	6/24/2013 12:59
CALCIUM	55000		1000	UG/L	10	6/24/2013 12:59
IRON	ND		100	UG/L	10	6/24/2013 12:59
POTASSIUM	2800		1000	UG/L	10	6/24/2013 12:59
MAGNESIUM	68000		100	UG/L	10	6/24/2013 12:59
MANGANESE	2.6		2	UG/L	10	6/24/2013 12:59
SODIUM	140000		1000	UG/L	10	6/24/2013 12:59

## ALS Environmental -- FC

## SAMPLE SUMMARY REPORT

**Client:** Western Water and Land, Inc.  
**Project:** 30000.01.02 WPX Baseline Water Quality  
**Sample ID:** GM 32-4 RG UP 1  
**Legal Location:**  
**Collection Date:** 6/11/2013 10:30

**Date:** 02-Aug-13  
**Work Order:** 1306160  
**Lab ID:** 1306160-1  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SELENIUM	2.5		1	UG/L	10	6/24/2013 12:59
STRONTIUM	1300		1	UG/L	10	6/24/2013 12:59
PH			SM4500-H		Prep Date: 6/14/2013	PrepBy: AJD
PH	8.39		0.1	mg/l	1	6/14/2013
SPECIFIC CONDUCTANCE IN WATER			SM2510B		Prep Date: 6/14/2013	PrepBy: AJD
SPECIFIC CONDUCTIVITY	1310		1	umhos/cm	1	6/14/2013
TOTAL DISSOLVED SOLIDS			SM2540C		Prep Date: 6/17/2013	PrepBy: AJD
TOTAL DISSOLVED SOLIDS	900		20	MG/L	1	6/18/2013
TOTAL PHOSPHORUS AS P			EPA365.2		Prep Date: 6/18/2013	PrepBy: TWK
TOTAL PHOSPHORUS	ND		0.05	MG/L	1	6/18/2013

# ALS Environmental -- FC

# SAMPLE SUMMARY REPORT

**Client:** Western Water and Land, Inc.  
**Project:** 30000.01.02 WPX Baseline Water Quality  
**Sample ID:** GM 32-4 RG DWN 1  
**Legal Location:**  
**Collection Date:** 6/11/2013 09:15

**Date:** 02-Aug-13  
**Work Order:** 1306160  
**Lab ID:** 1306160-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>ALKALINITY AS CALCIUM CARBONATE</b>						
BICARBONATE AS CaCO3	300		20	MG/L	1	6/18/2013
CARBONATE AS CaCO3	36		20	MG/L	1	6/18/2013
TOTAL ALKALINITY AS CaCO3	340		20	MG/L	1	6/18/2013
<b>BIOLOGICAL ACTIVITY REACTION TEST</b>						
IRON RELATED BACTERIA	1			NU	1	6/23/2013
SLIME FORMING BACTERIA	1			NU	1	6/23/2013
SULFATE REDUCING BACTERIA	1			NU	1	6/23/2013
<b>DIESEL RANGE ORGANICS</b>						
Diesel Range Organics	ND		0.5	MG/L	1	6/14/2013 20:38
Surr: O-TERPHENYL	91		51-97	%REC	1	6/14/2013 20:38
<b>DISSOLVED GASSES</b>						
METHANE	ND		1	UG/L	1	6/13/2013 11:44
ETHANE	ND		2	UG/L	1	6/13/2013 11:44
PROPANE	ND		1	UG/L	1	6/13/2013 11:44
<b>GC/MS VOLATILES</b>						
BENZENE	ND		1	UG/L	1	6/14/2013 15:07
TOLUENE	ND		1	UG/L	1	6/14/2013 15:07
ETHYLBENZENE	ND		1	UG/L	1	6/14/2013 15:07
M+P-XYLENE	ND		1	UG/L	1	6/14/2013 15:07
O-XYLENE	ND		1	UG/L	1	6/14/2013 15:07
GASOLINE RANGE ORGANICS	ND		100	UG/L	1	6/14/2013 15:07
Surr: DIBROMOFLUOROMETHANE	100		84-118	%REC	1	6/14/2013 15:07
Surr: TOLUENE-D8	99		85-115	%REC	1	6/14/2013 15:07
Surr: 4-BROMOFLUOROBENZENE	97		85-115	%REC	1	6/14/2013 15:07
<b>ION CHROMATOGRAPHY</b>						
BROMIDE	ND		0.2	MG/L	1	6/12/2013 15:51
CHLORIDE	20		2	MG/L	10	6/12/2013 16:33
FLUORIDE	0.56		0.1	MG/L	1	6/12/2013 15:51
NITRATE AS N	0.24		0.2	MG/L	1	6/12/2013 15:51
NITRITE AS N	ND		0.1	MG/L	1	6/12/2013 15:51
SULFATE	340		10	MG/L	10	6/12/2013 16:33
<b>METALS BY 200.8</b>						
BORON	170		50	UG/L	10	6/24/2013 13:02
BARIUM	30		1	UG/L	10	6/24/2013 13:02
CALCIUM	51000		1000	UG/L	10	6/24/2013 13:02
IRON	ND		100	UG/L	10	6/24/2013 13:02
POTASSIUM	2900		1000	UG/L	10	6/24/2013 13:02
MAGNESIUM	72000		100	UG/L	10	6/24/2013 13:02
MANGANESE	ND		2	UG/L	10	6/24/2013 13:02
SODIUM	140000		1000	UG/L	10	6/24/2013 13:02

## ALS Environmental -- FC

## SAMPLE SUMMARY REPORT

**Client:** Western Water and Land, Inc.  
**Project:** 30000.01.02 WPX Baseline Water Quality  
**Sample ID:** GM 32-4 RG DWN 1  
**Legal Location:**  
**Collection Date:** 6/11/2013 09:15

**Date:** 02-Aug-13  
**Work Order:** 1306160  
**Lab ID:** 1306160-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SELENIUM	1.8		1	UG/L	10	6/24/2013 13:02
STRONTIUM	1300		1	UG/L	10	6/24/2013 13:02
PH			SM4500-H		Prep Date: 6/14/2013	PrepBy: AJD
PH	8.49		0.1	mg/l	1	6/14/2013
SPECIFIC CONDUCTANCE IN WATER			SM2510B		Prep Date: 6/14/2013	PrepBy: AJD
SPECIFIC CONDUCTIVITY	1360		1	umhos/cm	1	6/14/2013
TOTAL DISSOLVED SOLIDS			SM2540C		Prep Date: 6/17/2013	PrepBy: AJD
TOTAL DISSOLVED SOLIDS	880		20	MG/L	1	6/18/2013
TOTAL PHOSPHORUS AS P			EPA365.2		Prep Date: 6/18/2013	PrepBy: TWK
TOTAL PHOSPHORUS	ND		0.05	MG/L	1	6/18/2013

## ALS Environmental -- FC

## SAMPLE SUMMARY REPORT

**Client:** Western Water and Land, Inc.  
**Project:** 30000.01.02 WPX Baseline Water Quality  
**Sample ID:** Trip Blank  
**Legal Location:**  
**Collection Date:** 6/11/2013

**Date:** 02-Aug-13  
**Work Order:** 1306160  
**Lab ID:** 1306160-3  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>						
<b>GC/MS VOLATILES</b>			<b>SW8260_25</b>		Prep Date: <b>6/14/2013</b>	PrepBy: <b>SDW</b>
BENZENE	ND		1	UG/L	1	6/14/2013 15:29
TOLUENE	ND		1	UG/L	1	6/14/2013 15:29
ETHYLBENZENE	ND		1	UG/L	1	6/14/2013 15:29
M+P-XYLENE	ND		1	UG/L	1	6/14/2013 15:29
O-XYLENE	ND		1	UG/L	1	6/14/2013 15:29
GASOLINE RANGE ORGANICS	ND		100	UG/L	1	6/14/2013 15:29
Surr: DIBROMOFLUOROMETHANE	101		84-118	%REC	1	6/14/2013 15:29
Surr: TOLUENE-D8	97		85-115	%REC	1	6/14/2013 15:29
Surr: 4-BROMOFLUOROBENZENE	99		85-115	%REC	1	6/14/2013 15:29



# ALS Environmental -- FC

# SAMPLE SUMMARY REPORT

**Client:** Western Water and Land, Inc.  
**Project:** 30000.01.02 WPX Baseline Water Quality  
**Sample ID:** Trip Blank  
**Legal Location:**  
**Collection Date:** 6/11/2013

**Date:** 02-Aug-13  
**Work Order:** 1306160  
**Lab ID:** 1306160-3  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
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## Explanation of Qualifiers

### Radiochemistry:

U or ND - Result is less than the sample specific MDC.	M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.	L - LCS Recovery below lower control limit.
Y2 - Chemical Yield outside default limits.	H - LCS Recovery above upper control limit.
W - DER is greater than Warning Limit of 1.42	P - LCS, Matrix Spike Recovery within control limits.
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.	N - Matrix Spike Recovery outside control limits
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.	NC - Not Calculated for duplicate results less than 5 times MDC
G - Sample density differs by more than 15% of LCS density.	B - Analyte concentration greater than MDC.
D - DER is greater than Control Limit	B3 - Analyte concentration greater than MDC but less than Requested MDC.
M - Requested MDC not met.	
LT - Result is less than requested MDC but greater than achieved MDC.	

### Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).  
 U or ND - Indicates that the compound was analyzed for but not detected.  
 E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.  
 M - Duplicate injection precision was not met.  
 N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.  
 Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.  
 \* - Duplicate analysis (relative percent difference) not within control limits.

### Organics:

U or ND - Indicates that the compound was analyzed for but not detected.  
 B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.  
 E - Analyte concentration exceeds the upper level of the calibration range.  
 J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).  
 A - A tentatively identified compound is a suspected aldol-condensation product.  
 X - The analyte was diluted below an accurate quantitation level.  
 \* - The spike recovery is equal to or outside the control criteria used.  
 + - The relative percent difference (RPD) equals or exceeds the control criteria.

### Diesel Range Organics:

# ALS Environmental -- FC

# SAMPLE SUMMARY REPORT

**Client:** Western Water and Land, Inc.  
**Project:** 30000.01.02 WPX Baseline Water Quality  
**Sample ID:** Trip Blank  
**Legal Location:**  
**Collection Date:** 6/11/2013

**Date:** 02-Aug-13  
**Work Order:** 1306160  
**Lab ID:** 1306160-3  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<p>G - A pattern resembling gasoline was detected in this sample.  D - A pattern resembling diesel was detected in this sample.  M - A pattern resembling motor oil was detected in this sample.  C - A pattern resembling crude oil was detected in this sample.  4 - A pattern resembling JP-4 was detected in this sample.  5 - A pattern resembling JP-5 was detected in this sample.  H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.  L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.  Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:  - gasoline  - JP-8  - diesel  - mineral spirits  - motor oil  - Stoddard solvent  - bunker C</p>						

# ALS Environmental -- FC

Date: 8/2/2013 7:26:2

Client: Western Water and Land, Inc.

## QC BATCH REPORT

Work Order: 1306160

Project: 30000.01.02 WPX Baseline Water Quality

Batch ID: EX130614-1-1 Instrument ID FUELS-1 Method: SW8015M

LCS	Sample ID: EX130614-1				Units: MG/L		Analysis Date: 6/14/2013 14:59			
Client ID:		Run ID: FUELS130614-3A				Prep Date: 6/14/2013		DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
Diesel Range Organics	10.4	0.5	10		104	36-150			20	
Surr: O-TERPHENYL	1.25		1.25		100	51-97				*

LCSD	Sample ID: EX130614-1				Units: MG/L		Analysis Date: 6/14/2013 15:30			
Client ID:	Run ID: FUELS130614-3A				Prep Date: 6/14/2013			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
Diesel Range Organics	10.5	0.5	10		105	36-150	10.4	1	20	
Surr: O-TERPHENYL	1.27		1.25		102	51-97		2		*

MB	Sample ID: EX130614-1				Units: MG/L		Analysis Date: 6/14/2013 14:28			
Client ID:	Run ID: FUELS130614-3A				Prep Date: 6/14/2013			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
Diesel Range Organics	ND	0.5								
Surr: O-TERPHENYL	1.28		1.25		102	51-97				*

The following samples were analyzed in this batch:

1306160-1 1306160-2

Client: Western Water and Land, Inc.  
 Work Order: 1306160  
 Project: 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **HC130613-9-1** Instrument ID **MEE-1** Method: **RSK175**

DUP	Sample ID: 1306160-1				Units: UG/L		Analysis Date: 6/13/2013 11:42			
Client ID: GM 32-4 RG UP 1			Run ID: HC130613-9A			Prep Date: 6/13/2013			DF: 1	
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	ND	1					1		25	
ETHANE	ND	2					2		25	
PROPANE	ND	1					1		25	

LCS	Sample ID: <b>HC130613-9</b>				Units: <b>UG/L</b>		Analysis Date: <b>6/13/2013 11:21</b>			
Client ID:	Run ID: <b>HC130613-9A</b>				Prep Date: <b>6/13/2013</b>			DF: <b>1</b>		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	157	1	142		110	80-120			25	
ETHANE	293	2	267		110	80-120			25	
PROPANE	415	1	391		106	80-120			25	

LCSD	Sample ID: <b>HC130613-9</b>				Units: <b>UG/L</b>		Analysis Date: <b>6/13/2013 11:53</b>			
Client ID:	Run ID: <b>HC130613-9A</b>				Prep Date: <b>6/13/2013</b>			DF: <b>1</b>		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	160	1	142		112	80-120	157	2	25	
ETHANE	298	2	267		112	80-120	293	1	25	
PROPANE	422	1	391		108	80-120	415	2	25	

MB	Sample ID: <b>HC130613-9</b>				Units: <b>UG/L</b>		Analysis Date: <b>6/13/2013 11:25</b>			
Client ID:	Run ID: <b>HC130613-9A</b>				Prep Date: <b>6/13/2013</b>			DF: <b>1</b>		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	ND	1								
ETHANE	ND	2								
PROPANE	ND	1								

The following samples were analyzed in this batch:

1306160-1 1306160-2

**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **IP130620-1-4** Instrument ID **ICPMS2** Method: **EPA200.8**

<b>LCS</b>	Sample ID: <b>FM130617-1</b>			Units: <b>UG/L</b>			Analysis Date: <b>6/24/2013 12:31</b>			
Client ID:	Run ID: <b>IM130624-10A3</b>			Prep Date: <b>6/20/2013</b>			DF: <b>10</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
BARIUM	102	1	100		102	85-115			20	
BORON	952	50	1000		95	85-115			20	
CALCIUM	9910	1000	10000		99	85-115			20	
IRON	5100	100	5000		102	85-115			20	
MAGNESIUM	9360	100	10000		94	85-115			20	
MANGANESE	193	2	200		96	85-115			20	
POTASSIUM	5360	1000	5000		107	85-115			20	
SELENIUM	98.2	1	100		98	85-115			20	
SODIUM	10100	1000	10000		101	85-115			20	
STRONTIUM	98.4	1	100		98	85-115			20	

<b>MB</b>	Sample ID: <b>F130617-1</b>			Units: <b>UG/L</b>			Analysis Date: <b>6/24/2013 12:08</b>			
Client ID:	Run ID: <b>IM130624-10A3</b>			Prep Date: <b>6/20/2013</b>			DF: <b>10</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
BARIUM	ND	1								
BORON	ND	50								
CALCIUM	ND	1000								
IRON	ND	100								
MAGNESIUM	ND	100								
MANGANESE	ND	2								
POTASSIUM	ND	1000								
SELENIUM	ND	1								
SODIUM	ND	1000								
STRONTIUM	ND	1								

The following samples were analyzed in this batch:

1306160-1 1306160-2

**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **VL130614-3-1**      Instrument ID: **HPV1**      Method: **SW8260\_25**

<b>LCS</b>	Sample ID: <b>VL130614-3</b>			Units: <b>UG/L</b>			Analysis Date: <b>6/14/2013 13:40</b>			
Client ID:	Run ID: <b>VL130614-3A</b>			Prep Date: <b>6/14/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
BENZENE	10.9	1	10		109	83-117			20	
TOLUENE	10.5	1	10		105	82-113			20	
ETHYLBENZENE	10.5	1	10		105	81-113			20	
M+P-XYLENE	21.3	1	20		107	82-115			20	
O-XYLENE	10.6	1	10		106	81-115			20	
GASOLINE RANGE ORGANICS	496	100	500		99.244	80-120			20	
Surr: DIBROMOFLUOROMETHA	25.9		25		104	84-118				
Surr: TOLUENE-D8	25.1		25		100	85-115				
Surr: 4-BROMOFLUOROBENZE	24.7		25		99	85-115				

<b>LCSD</b>	Sample ID: <b>VL130614-3</b>			Units: <b>UG/L</b>			Analysis Date: <b>6/14/2013 14:02</b>			
Client ID:	Run ID: <b>VL130614-3A</b>			Prep Date: <b>6/14/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
BENZENE	10.3	1	10		103	83-117	10.9	5	20	
TOLUENE	9.9	1	10		99	82-113	10.5	6	20	
ETHYLBENZENE	10	1	10		100	81-113	10.5	5	20	
M+P-XYLENE	19.9	1	20		100	82-115	21.3	7	20	
O-XYLENE	10	1	10		100	81-115	10.6	6	20	
GASOLINE RANGE ORGANICS	481	100	500		96.134	80-120	496		20	
Surr: DIBROMOFLUOROMETHA	25.3		25		101	84-118		2		
Surr: TOLUENE-D8	25.1		25		100	85-115		0		
Surr: 4-BROMOFLUOROBENZE	24.7		25		99	85-115		0		

<b>MB</b>	Sample ID: <b>VL130614-3</b>			Units: <b>UG/L</b>			Analysis Date: <b>6/14/2013 14:23</b>			
Client ID:	Run ID: <b>VL130614-3A</b>			Prep Date: <b>6/14/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
BENZENE	ND	1								
TOLUENE	ND	1								
ETHYLBENZENE	ND	1								
M+P-XYLENE	ND	1								
O-XYLENE	ND	1								
GASOLINE RANGE ORGANICS	ND	100								
Surr: DIBROMOFLUOROMETHA	25.3		25		101	84-118				
Surr: TOLUENE-D8	24.7		25		99	85-115				
Surr: 4-BROMOFLUOROBENZE	24.4		25		98	85-115				

The following samples were analyzed in this batch:

1306160-1	1306160-2	1306160-3
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**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **AK130618-2-1** Instrument ID **NONE** Method: **SM2320B**

<b>LCS</b>		Sample ID: <b>AK130618-2</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>		
Client ID:		Run ID: <b>ak130618-2a</b>			Prep Date: <b>6/18/2013</b>			DF: <b>1</b>		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL ALKALINITY AS CaCO3	99.4	5	100		99	85-115			15	

<b>MB</b>		Sample ID: <b>AK130618-2</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>		
Client ID:		Run ID: <b>ak130618-2a</b>			Prep Date: <b>6/18/2013</b>			DF: <b>1</b>		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
BICARBONATE AS CaCO3	ND	5								
CARBONATE AS CaCO3	ND	5								
TOTAL ALKALINITY AS CaCO3	ND	5								

The following samples were analyzed in this batch:

1306160-1 1306160-2

**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **IC130612-1-2** Instrument ID **IC** Method: **EPA300.0**

<b>LCS</b>	Sample ID: <b>IC130612-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/12/2013 12:18</b>			
Client ID:	Run ID: <b>IC130612-1A1</b>			Prep Date: <b>6/12/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
FLUORIDE	1.95	0.1	2		97	90-110			15	
CHLORIDE	4.98	0.2	5		100	90-110			15	
NITRITE AS N	1.98	0.1	2		99	90-110			15	
BROMIDE	5.26	0.2	5		105	90-110			15	
NITRATE AS N	5.04	0.2	5		101	90-110			15	
SULFATE	18.9	1	20		95	90-110			15	

<b>MB</b>	Sample ID: <b>IC130612-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/12/2013 12:32</b>			
Client ID:	Run ID: <b>IC130612-1A1</b>			Prep Date: <b>6/12/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
FLUORIDE	ND	0.1								
CHLORIDE	ND	0.2								
NITRITE AS N	ND	0.1								
BROMIDE	ND	0.2								
NITRATE AS N	ND	0.2								
SULFATE	ND	1								

The following samples were analyzed in this batch:

1306160-1 1306160-2



**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **ph130614-1-1** Instrument ID **pH-1** Method: **SM4500-H**

**DUP** Sample ID: **1306160-1** Units: **mg/l** Analysis Date: **6/14/2013**  
Client ID: **GM 32-4 RG UP 1** Run ID: **pH130614-1a** Prep Date: **6/14/2013** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
PH	8.46	0.1					8.39		0.2	

The following samples were analyzed in this batch:

1306160-1	1306160-2
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**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **SC130614-1-1** Instrument ID **pH-1** Method: **SM2510B**

**DUP** Sample ID: **1306160-2** Units: **umhos/cm** Analysis Date: **6/14/2013**  
Client ID: **GM 32-4 RG DWN 1** Run ID: **SC130614-1A** Prep Date: **6/14/2013** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
SPECIFIC CONDUCTIVITY	1360	1					1360	0	10	

The following samples were analyzed in this batch:

1306160-1	1306160-2
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**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **TD130617-1-2** Instrument ID **Balance** Method: **SM2540C**

<b>LCS</b>		Sample ID: <b>TD130617-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>		
Client ID:		Run ID: <b>TD130618-1a</b>			Prep Date: <b>6/17/2013</b>			DF: <b>1</b>		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	416	20	400		104	85-115			5	

<b>MB</b>		Sample ID: <b>TD130617-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>		
Client ID:		Run ID: <b>TD130618-1a</b>			Prep Date: <b>6/17/2013</b>			DF: <b>1</b>		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	ND	20								

The following samples were analyzed in this batch:

1306160-1	1306160-2
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**Client:** Western Water and Land, Inc.  
**Work Order:** 1306160  
**Project:** 30000.01.02 WPX Baseline Water Quality

## QC BATCH REPORT

Batch ID: **TP130618-1-1** Instrument ID **Spec** Method: **EPA365.2**

<b>LCS</b>	Sample ID: <b>TP130618-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>			
Client ID:	Run ID: <b>TP130618-1</b>			Prep Date: <b>6/18/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL PHOSPHORUS	0.492	0.05	0.5		98	80-120			20	

<b>MB</b>	Sample ID: <b>TP130618-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>			
Client ID:	Run ID: <b>TP130618-1</b>			Prep Date: <b>6/18/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL PHOSPHORUS	ND	0.05								

<b>MS</b>	Sample ID: <b>1306160-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>			
Client ID: <b>GM 32-4 RG UP 1</b>	Run ID: <b>TP130618-1</b>			Prep Date: <b>6/18/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL PHOSPHORUS	0.545	0.05	0.5	0.05	109	80-120			20	

<b>MSD</b>	Sample ID: <b>1306160-1</b>			Units: <b>MG/L</b>			Analysis Date: <b>6/18/2013</b>			
Client ID: <b>GM 32-4 RG UP 1</b>	Run ID: <b>TP130618-1</b>			Prep Date: <b>6/18/2013</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL PHOSPHORUS	0.541	0.05	0.5	0.05	108	80-120	0.545	1	20	

The following samples were analyzed in this batch:

1306160-1	1306160-2
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