Western Water & Land, Inc.

January 20, 2013

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

RE: GV 86-2 Drill Pad Baseline Results Report, October 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) GV 86-2 Drill Pad in accordance with Colorado Oil and Gas Conservation Commission (COGCC) Rule 609. The GV 86-2 Drill Pad is located in NE¼, SW ¼, Section 2, Township 7 South, Range 95 West, 6th PM.

In accordance with Rule 609, the baseline water quality evaluation considered all water sources (domestic wells or springs) within a 0.5-mile radius of the referenced drill pad (oil and gas location). A preliminary screening of the groundwater sources was completed to identify the sources that are potentially available for sampling pending the consent of the structure owners. Each potentially Available Water Source was then evaluated to identify the preferred sources for the baseline program. If the number of potentially available sources was four or less, all of the sources were included in the list of preferred sources. If more than four sources were potentially available, the sources were prioritized based on WWL's hydrologic expertise and in accordance with Rule 609. A complete description of the water source evaluation process and results are provided in the water source evaluation report (GV 86-2 Drill Pad Baseline Water Quality Evaluation, October 10, 2013).

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

FIELD SAMPLING LOCATIONS AND ACTIVITIES

As described in the GV 86-2 Drill Pad Baseline Water Quality Evaluation, October 10, 2013, four potential sampling locations were identified for field sampling of water quality consistent with requirements of Rule 609. 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. Four wells were identified as preferred sampling locations:

- Water Well Permit No. 149334
- Water Well Permit No. 267230

743 Horizon Court Suite 330, Grand Junction, CO 81506
Phone: (970) 242-0170 Fax: (970) 242-0270

- Water Well Permit No. 149891
- Water Well Permit No. 120988

Access was not granted for Water Well Permit No. 149334 or Water Well Permit No. 120988 within the 30-day response period required by Rule 609. Access was granted for Water Well Permit No. 267230 after four samples were already collected; therefore, it was not included in the baseline water quality program. WPX was granted permission to sample three alternative water sources: Water Well Permit No. 112927, Water Well Permit No. 273609, and Water Well Permit No. 100326.

Four samples were collected for the GV 86-2 Drill Pad. Sample Mitchell 149891 was collected from Water Well Permit No. 149891 on October 16th, 2013, sample Schuette 273609 was collected from Water Well Permit No. 273609 on October 17th. 2013, sample Firth 112927 was collected from Water Well Permit No. 112927 on October 21st, 2013, and sample Rice-Well was collected from Water Well Permit No. 100326 on October 22nd, 2013.

Mr. Orley Mitchell and Mrs. Thea Mitchell were present when sample Mitchell 149891 was collected. The sample was collected from a hose bib located near the front door of the residence. There was no water treatment system in use before the sampling point. Seven casing volumes were purged because field parameters did not stabilize according to the WPX Sampling and Analysis Plan (SAP) parameter stabilization criteria. Sample Schuette 273609 was collected from a hydrant behind a barn on Mr. Mark Schuette's property. There was no water treatment system in use before the sampling point. Sample Firth 112927 was collected from a hose bib located next to the well. A friend of the property owner Mr. Samuel Firth (Ms. Rochelle Morrison)was present during sampling. Ms. Morrison explained to WWL personnel that if the well is pumped too long it often brings sediment up and plugs or damages household appliances. She had been running the well intermittently for three hours prior to our arrival and requested that we purge the well for no longer than ten minutes. As a result of these events, the sample was collected after the well was purged for ten minutes; field parameters were not stable according to the WPX SAP criteria. There was no water treatment system in use before the sampling point. Sample Rice-Well was collected from a hydrant in the lawn to the west of the Rice residence. There was no water treatment system in use before the sampling point. Mr. John Rice was present during sampling. See Figure 1 for 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 WPX SAP and COGCC Model SAP. Sampling Method 1 for wells with pumps and effervescent samples, described in Version 1 of the COGCC Model SAP, was used to collect 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 quality control evaluations of cation-anion balance (CAB) and 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. All samples were collected by direct filling methods; dissolved gas sampling was done using Method 1 for wells with pumps and effervescent samples. No field procedure deviations occurred that were cause for data qualification.

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

Sample Receipt
Samples were received by ALS in four coolers within the temperature range criteria (4°C $\pm$ 2°C). Custody seals were intact. No issues were reported on the sample receipt form. No qualifiers were assigned to results based on sample receipt conditions.

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

Analytical Methods
The analytical methods used by ALS 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.

The lab report summary lists the analytic method for total xylenes as Method SW8260_25 Revision C and the analytic method for total nitrate/nitrite as N as EPA 300.0; however, the results are simply calculated by summing the results of the individual isotopes.

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.

All samples: all analyzed metals had dilution factors of 10. All other analytes had a dilution factor of 1. ALS reports sample results at the reporting limit (RL) as "undetected" or "U" rather than reporting results as less than the reporting limit, e.g. < 0.05ug/L.

Completeness
Data completeness is a measure of requested analysis and received results. The analytical constituents required under Rule 609 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 Rule 609. All requested analytical data matched the laboratory reported data results; data completeness is considered 100 percent.

Cation-Anion Balance
The cation-anion balance (CAB) calculates the total charge of positively charged ions and the total charge of the negatively charged ions. It is a measure of the quality of the analysis; if the charge is not balanced, an error may exist in the analysis. CAB 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:

- Mitchell 149891: 6.501%
- Schuette 273609: 5.896%
- Firth 112927: 3.663%
- Rice-Well: 2.152%

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 or 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:

- Mitchell 149891: 1.21
- Schuette 273609: 1.24
- Firth 112927: 1.24
- Rice-Well: 1.20

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

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

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

Trip Blanks
Trip blanks are analyte-free matrix (water in this case) samples supplied by the analytical laboratory that are shipped inside the sample shipping containers to and from the field investigation site. Field blanks test for potential contamination during shipping and sampling field procedures. For this project, field blanks are analyzed for volatiles only.

With the exception of trip blank sample 1310387-2 (associated with sample Rice-Well), there were no detections of volatiles (BTEX) in the analyzed trip blank samples. As stated by ALS, "*The results for 1310387-2 (Trip Blank) indicate GRO in the sample. Further scrutinizing of the chromatogram for this sample revealed the presence of non-target peaks which were later identified as artifacts likely produced in the VOC vial (septa) manufacturing process. The vendor was contacted, and the contamination documented. There were no unique identifiers common to gasoline in the sample. No further action was taken."*

As a result of the above investigation of the detections in trip blank sample 1310387-2 and no detections of volatiles in the associated investigative sample, the trip blank results were qualified as "R", a rejected result.

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 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 80 to 120 percent for wet chemistry and 70 to 130 percent for metals. Typical percent recovery acceptance limits are within the 70 to 130 percent range. 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. Note that the analytical laboratory may not have selected a sample from this field investigation for testing matrix quality control samples. In these cases, true matrix affects cannot be assessed and the resulting data should be considered as estimated. This will be noted in the DQR sheets (Attachment C), but the data is not qualified by WWL.

The matrix spike and matrix spike duplicate recoveries could not be evaluated for sodium or strontium in sample Firth 112927; the concentration of these analytes exceeded the matrix spike added during digestion by greater than four times, and recoveries may not be accurate. However, the laboratory control sample indicates that the digestion and analyses were within control limits. 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 C.

Summary
ALS Laboratories assigned analytical results that were undetected with a "U" qualifier, and results that fell above the method detection limit but below the reporting limit with a "J" to indicate the results are estimated. WWL assigned an "H" qualifier for analyses performed outside of analytic holding times to indicate the results are estimated, and an "R" qualifier to indicate the data is rejected. 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 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.

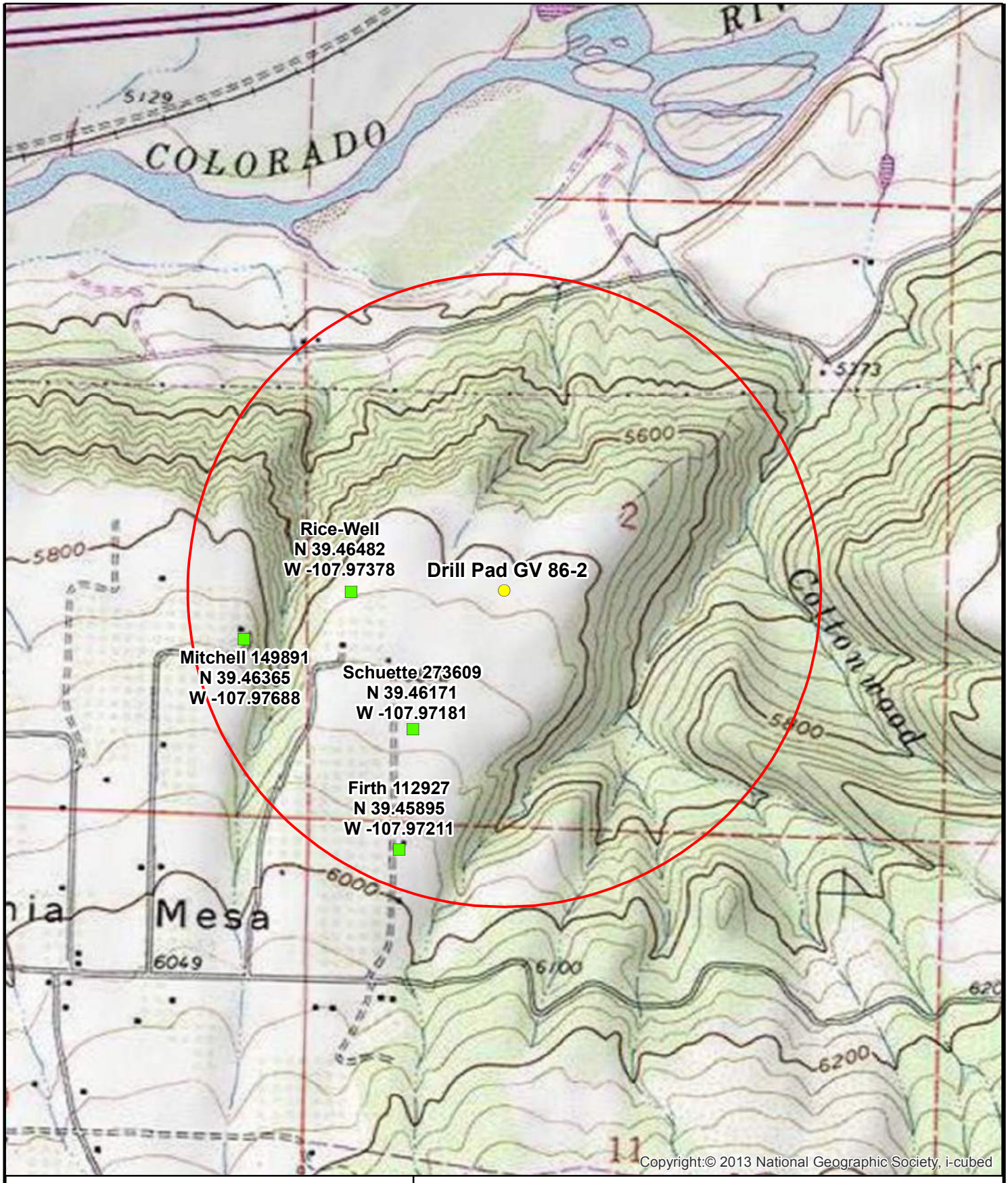
If you have any questions or concerns, please contact me at (970) 242-0170.

Sincerely,

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

Attachments

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



Legend

Sample Location(s)

Drill Pad GV 86-2

0.5-Mile Radius Evaluation Area

N

Feet

1,000 500 0 1,000

1:13,000

Figure 1: Drill Pad GV 86-2 Sample Locations
NE1/4, SW1/4, S2, T7S, R95W, 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. Mitchell Well Sampling Location (GV 86-2 Mitchell 149891)

Photo 2. Mitchell Well (GV 86-2 Mitchell 149891)

Photo 3. Schuette Well Sampling Location (GV 86-2 Schuette-273609)

Photo 4. Schuette Well (GV 86-2 Schuette-273609)

Photo 5. Firth Well Sampling Location (GV 86-2 Firth 112927)

Photo 6. Firth Well (GV 86-2 Firth 112927)

Photo 7. Rice Well Sampling Location (GV 86-2 Rice-Well)

Photo 8. Rice Well (GV 86-2 Rice-Well)

ATTACHMENT B

Field Monitoring Forms

WPX BWQ Groundwater Monitoring Field Form

Project Information			
Project:	WPX BWQ	Sample Purpose:	Baseline
Site Name (Well Pad):	GV 8e-2	Site API:	05-045-06703
Station Name:	Firth 112927	Sample Date:	10-21-13
COGCC Facility ID:	703063	Start Time:	0920
Field Sample ID:	Firth	End Time:	1011
Landowner Name:	Samuel Firth	Sample Time:	0942
Landowner Address:	3739 CR 301, Parachute, CO	Sample Team:	SLG, NWS
Water Right/Well Owner:	Samuel Firth	Observer:	NWS
Water Right/Well Permit:	112927	Lead Signature/Date:	10-29-13
Receipt Number:	0201820		

Station Information					
Station Description:	Hose bib by well				
Approximate Distance to Well Pad:					
Station Type:	Well / Spring / Seep / Other:		Water Use:	Domestic / Irrigation /	
Sampling Location:	Kitchen Tap / Pipe / Well House / Hose bib / Other:				
GPS Location:	Zone —	x 39.45895	y -107.97211	z —	
Total Depth (ft):	180	Static Depth to Water (ft):	NM	Well diameter (in):	4
Purge Volume (gal)	40 gal purged				

Weather Conditions			
Sky:	Clear / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	40 °F
Precipitation:	None / Light / Moderate / Heavy	Precip Type:	None / Rain / Sleet / Hail / Snow
Wind:	Calm / Light / Mod / Strong	Wind Speed/Direction:	0

Field Measurements

Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	12.29	1006		YSI 556	Container	
pH	s.u.	7.29					
Sp. Conductivity	uS/cm	648					
Conductivity	uS/cm	492					
DO Saturation	%	64.8					
DO	mg/L	6.87					
Baro Press	mmHg	614.1					
ORP	RmV	221.0					
Turbidity	NTU	9.26			MicroTP		10.13, 9.55, 8.10
Discharge	GPM	4.2	0930		bucket + watch		
H2S	mg/L						

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
			may be after effervescense
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 Groundwater Monitoring Field Form

Landowner Comments on water quality:

Says that their well isn't in great operating condition — if it runs too long it brings sediment up + plugs all of the household appliances (sink, dish washer, washer, etc.) with sediment. We told the landowner we will not run it for more than 10 minutes before sample to prevent this. She has had the well running since 1am for a period of time. She was okay with our 10 min plan.

Additional information:

Discharge:
2.15 gal / 34.9 sec = 4.3 gpm

Waypoint #16

Only purged for 10 min., parameters almost 100% stabilized to criteria. No signs of heavy sediment like the landowner reports after discharging too long.

Gary Reed present for sample, Rochelle Firth present.

Calibration Information			Date: 10-21-13			Location: Office		
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
YSI 556	pH	s.u.	0711	7.00	22.26	7.00	7.00	
	pH	s.u.	0714	10.01	22.21	9.99	10.01	
	pH	s.u.	0716	4.01	22.06	3.96	4.00	
	SpC	uS/cm	0720	2070	22.12	2050	2070	
	SpC	uS/cm	0724		21.72	86.2		643.5 mm Hg
	DO	%						
	DO	%						
	ORP	RmV						
micro TP	Turbidity	NTU	0721					

WPX BWQ Groundwater Monitoring Field Form

Firth well

Well Purging Information		
Date: 10-21-13	Purge Method: Landowner request to not pump > 10 min	
Total Depth, ft (d_t): 1880	Static Depth to Water, ft (d_w): NM	Sample/Set Depth (ft): NM
Bore Radius (in): Q	Bore Volume (ft^3): Q	Casing Radius (in): Q
Total Volume (gal or ft^3): Q	Total Volume x 3 (gal or ft^3): Q	

1 ft^3 = 7.48 gal

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

Purge #	Time	pH (s.u.)	SpC (uS/cm)	Cond (uS/cm)	DO (%)	DO (mg/L)	ORP (RmV)	Water Clarity (Poor/Mod / Good)	Effervescence (None /Slight/ Mod/Heavy)	Volume Purged (gal)	Cum Vol Purged (gal)
1	0930	7.04	643	478	70.2	4.57	251.4	6.43	none	~~12.5~~	~~12.5~~
2	0933	6.94	646	478	71.8	7.80	253.2	1.91	none	12	24
3	0937	6.94	649	480	70.3	7.62	243.9	1.99	none	16	40

11:54 11:35 11:37 Lem?

0927 Begin Purge

WPX BWQ Groundwater Monitoring Field Form

Project Information			
Project:	WPX BWQ	Sample Purpose:	Baseline
Site Name (Well Pad):	GV 86-2	Site API:	05-045-06703
Station Name:	Mitchell Water Well	Sample Date:	10-16-13
COGCC Facility ID:	704607	Start Time:	1010
Field Sample ID:	Mitchell 149891	End Time:	1300
Landowner Name:	Orley Mitchell	Sample Time:	1235
Landowner Address:	656 CR 346, Parachute, CO	Sample Team:	SLG, NWS
Water Right/Well Owner:	Orley Mitchell	Observer:	SLG
Water Right/Well Permit:	149891	Lead Signature/Date:	10-29-13
Receipt Number:	0281675		

Station Information					
Station Description:	Hose bib near front door				
Approximate Distance to Well Pad:	2210 ft				
Station Type:	Well / Spring / Seep / Other:		Water Use:	Domestic / Irrigation /	
Sampling Location:	Kitchen Tap / Pipe / Well House / Hose bib / Other:				
GPS Location:	Zone NM	x 39.46365	y 107.97688	z —	4"
Total Depth (ft):	200 ft	Static Depth to Water (ft): 145 ~~HAA~~		Well diameter (in):	~~6"~~ ≥ 4"
Purge Volume (gal)	total = 557				
	7 volumes = 565				

Weather Conditions			
Sky:	Clear / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	40
Precipitation:	None / Light / Moderate / Heavy	Precip Type:	None / Rain / Sleet / Hail / Snow
Wind:	Calm / Light / Mod / Strong	Wind Speed/Direction:	NA 10

Field Measurements

Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	10.59	1250		YSI 556	~~container~~	
pH	s.u.	7.88	↓		↓	↓	
Sp. Conductivity	uS/cm	571					
Conductivity	uS/cm	414					
DO Saturation	%	103.8					
DO	mg/L	7.06					
Baro Press	mmHg	614.1					
ORP	RmV	185.9					
Turbidity	NTU	27.95	↓	AV	MICROTP	↓	27.31, 28.75, 27.78
Discharge	gpm	10	1020	J	5 gal bucket		
H2S	mg/L	NM					

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

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 Groundwater Monitoring Field Form

Landowner Comments on water quality:

Has small amounts of sediment, No filter or treatment before use.

Gary Reed present for sample

Additional information:

Discharge 5 gal / 45.1 sec = 6.65 gpm = 6 gpm
5 gal / 58.21 se = 5.15 gpm

At purge #8 ⇒ water level below pump. Pump ~ 1165
1131 = 150.51 ft ⇒ let it recharge
1139 = 141.51
Water level after sample (1250) = 139.59
Parameters wouldn't stabalize. Purged close to 7 casing volumes + took sample, according to SAP.

Calibration Information			Date: 10-16-13			Location: Office		
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
YSI 556	pH	s.u.	834	7.00	21.33	7.05	7.00	
	pH	s.u.	837	10.01	21.30	10.01	10.01	
	pH	s.u.	839	4.01	21.33	4.02	4.01	
YSI 556	SpC	uS/cm	831	8974	21.28	8703	8974	
	SpC	uS/cm						
YSI 556	DO	%	850			83.3		644.1 mmHg
	DO	%						
	ORP	RmV						
micro TP	Turbidity	NTU	1010					

WPX BWQ Groundwater Monitoring Field Form

Well Purging Information

Date: 10-16-13	Purge Method: Parameters stabilization	
Total Depth, ft (d_t): 200	Static Depth to Water, ft (d_w): ~~NM~~ 145	Sample/Set Depth (ft): 170
Bore Radius (in): 3	Bore Volume (ft^3): 2	Casing Radius (in): 4" = diameter
Total Volume (gal or ft^3): ~~150 gal~~ 35 gal	Total Volume x 3 (gal or ft^3): ~~450~~ 105 gal	

$1\ ft^3 = 7.48$ gal

Bore Volume = $\pi r^2(d_t - d_w)$ $\pi(.16^2)(200-145)$ Discharge = 6 gpm

$= (.080)(55) = 4.4$

$4.4 \times 7.48 = 32.91$

Purge #	Time	pH (s.u.)	SpC (uS/cm)	Cond (uS/cm)	DO (%)	DO (mg/L)	ORP (RmV)	Water Clarity (Poor/Mod / Good)	Effervescence (None /Slight/ Mod/Heavy) turb	Volume Purged (gal)	Cum Vol Purged (gal)
	1040	7.55									
1	~~1050~~	~~4.83~~	557	394	54.2	6.35	359.0	good	2.84	60	60
~~2~~	~~1040~~									~~35~~	
2	1045	7.63	552	394	55.8	6.22	252.1	good	0.73	35	95
3	1050	7.73	553	395	58.7	6.55	233.1	good	4.24	35	130
4	1055	7.79	560	400	63.5	7.13	214.5	mod	63.29	35	165
5	1100	7.83	554	397	60.7	6.74	207.1	mod	47.47	35	200
6	1105	7.74	564	403	64.2	7.34	206.0	mod	176.4	35	235
7	1110	7.43	562	404	68.8	7.55	209.2	mod	176.2	35	270
8	1119	7.90	567	409	66.0	7.32	194.7	mod	112.1	55	325
9	1150	7.88	564	412	67.2	7.33	190.7	mod/g	107.5	18	343
10	1153	7.96	574	411	62.1	6.94	186.5	better	43.77	18	361
11	1156	7.93	569	407	61.5	6.87	186.6	good	30.43	18	379
12	1159	7.92	566	406	61.7	6.85	186.8	good	24.76	18	397
13	1203	7.91	555	396	59.5	6.63	185.6	good	12.68	24	415
14	1207	7.90	558	403	56.9	6.29	184.8	good	15.53	18	433
15	1210	7.91	558	399	60.3	6.60	183.1	good	12.82	18	451
16	1213	7.89	556	404	59.6	6.46	181.5	good	15.28	18	469
17	1216	7.91	560	400	62.1	6.97	177.4	good	11.61	18	487
18	1219	7.92	561	402	58.7	6.57	177.6	good	13.33	18	505
19	1222	7.90	562	402	63.0	7.06	177.7	good	15.68	18	523
20	1225	7.90	563	403	63.1	7.04	179.5	good	13.25	18	541
21	1228	7.89	563	402	64.6	7.22	181.1	good	11.11	18	559
22											
23											
24											

TOC water level

145.3

148.79

165

405

565-7

WPX BWQ Groundwater Monitoring Field Form

Project Information			
Project:	WPX ~~Courtesy~~ BWQ	Sample Purpose:	~~Courtesy~~ BASELINE
Site Name (Well Pad):	GV 86-2	Site API:	05-045-06703
Station Name:	Rice, John	Sample Date:	10-22-13
COGCC Facility ID:	703035	Start Time:	1251
Field Sample ID:	Rice-Well	End Time:	1534
Landowner Name:	John Rice	Sample Time:	1508
Landowner Address:	697 CR 355, Parachute, CO	Sample Team:	NWS
Water Right/Well Owner:	John Rice	Observer:	NWS
Water Right/Well Permit:	100326	Lead Signature/Date:	10-29-13
Receipt Number:	0094778		

Station Information					
Station Description:	Hydrant to west of house				
Approximate Distance to Well Pad:	1,280 ft				
Station Type:	(Well) / Spring / Seep / Other:		Water Use:	(Domestic) / Irrigation /	
Sampling Location:	Kitchen Tap / Pipe / Well House / Hose bib / Other:		Hydrant		
GPS Location:	Zone	x -107.97378	y 39.464182	z 5856	
Total Depth (ft):	Q	Static Depth to Water (ft):	Q	Well diameter (in):	Q
Purge Volume (gal)	304.5				

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

Field Measurements							
Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	11.66	1521		YSI 556	Container	
pH	s.u.	7.82					
Sp. Conductivity	uS/cm	677					
Conductivity	uS/cm	505					
DO Saturation	%	66.7					
DO	mg/L	7.14					
Baro Press	mmHg	618.0					
ORP	RmV	209.1					
Turbidity	NTU	1.68			Micro TPI		
Discharge	gpm	15	1323	J	5gal bucket		
H2S	mg/L	NM					

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

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 Groundwater Monitoring Field Form

Landowner Comments on water quality:

John mentioned he has lost water since last Summer.

Additional information:

1323 Discharge 5gal / 19.9 sec ~ 15gpm
1332 Discharge 5gal / 25.3 sec - spurting ~ 12 gpm
1333 Almost no flow
1334 Kicked back on for ~ 5 gal then almost no flow
1335 Pumped dry - will slow discharge for purging
1351 5gal / 45 sec ~ 6.6 gpm

Parameters stable except ORP which is ±13mV instead of ±10mV.

Calibration Information			Date: ~~10~~ 10-22-13			Location: OFFICE		
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
YSI 556	pH	s.u.	734	7.00	22.33	7.02	7.00	
	pH	s.u.	740	10.01	22.48	10.00	10.01	
	pH	s.u.	748	4.01	22.47	3.99	4.01	
	SpC	uS/cm	727	2070	22.38	2077	2070	
	SpC	uS/cm		~~646.~~				
	DO	%	802	646.3 mmHg	22.14	83.0	85.1	
	DO	%						
	ORP	RmV						
MicroTPI	Turbidity	NTU	811					

WPX BWQ Groundwater Monitoring Field Form

Rice-Well

Well Purging Information		
Date: 10-22-13	Purge Method: Stablize Parameters	
Total Depth, ft (d_t): Q	Static Depth to Water, ft (d_w): Q	Sample/Set Depth (ft): Q
Casing Radius (in): Q	Casing Volume (ft^3): Q	
Total Volume (gal or ft^3): Q	Total Volume x 3 (gal or ft^3): Q	

1 ft^3 = 7.48 gal

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

Purge #	Time	Temp (deg C)	pH (s.u.)	SpC (uS/cm)	Cond (uS/cm)	DO (%)	DO (mg/L)	ORP (RmV)	Water Clarity (Poor/Mod/ Good) or NTUs	Efferves-cence (None /Slight/ Mod/Heavy)	Volume Purged (gal)	Cum Vol Purged (gal)
1	1330	11.38	7.07	662	490	71.0	7.69	276.5	1.88	None	65	65
2	1335	11.76	7.10	676	505	71.8	7.73	263.8	0.38	None	60	125
	Pumped dry - allow well to recharge											
3	1355	11.53	7.65	676	502	68.1	7.32	236.8	0.79	Slight	26.5	151.5
4	1400	11.74	7.70	676	505	68.2	7.34	233.2	2.38	Slight	33	184.5
5	1419	11.83	7.78	674	505	63.2	6.80	231.8	0.69	Mod	5	189.5
6	1435	11.66	7.79	675	503	58.5	6.32	218.5	0.45	Mod	~~6540~~	229.5
7	1445	11.78	7.80	673	503	64.1	6.92	222.3	1.39	Mod	25	254.5
8	1455	11.70	7.82	676	504	66.5	7.17	220.4	1.21	Slight	25	279.5
9	1505	11.91	7.82	676	508	66.4	7.15	209.3	0.26	Slight	25	304.5

WPX BWQ Groundwater Monitoring Field Form

Project Information			
Project:	WPX BWQ	Sample Purpose:	Baseline
Site Name (Well Pad):	GV 86-2	Site API:	05-045-06703
Station Name:	~~Schuette~~ Schuette 273609	Sample Date:	10-17-13
COGCC Facility ID:	752941	Start Time:	1005
Field Sample ID:	Schuette-273609	End Time:	1253
Landowner Name:	Mark Schuette	Sample Time:	1216
Landowner Address:	70 Ramgart Pl, Parachute, CO	Sample Team:	NWS
Water Right/Well Owner:	Mark Schuette	Observer:	NWS
Water Right/Well Permit:	273609	Lead Signature/Date:	10-29-13
Receipt Number:	9502740		

Station Information					
Station Description:	Hydrant behind barn				
Approximate Distance to Well Pad:	1,390 ft				
Station Type:	Well / Spring / Seep / Other:		Water Use:	Domestic / Irrigation /	
Sampling Location:	Kitchen Tap / Pipe / Well House / Hose bib / Other: Hydrant				
GPS Location:	Zone	x 107.97151	y 37461	z 6046 ft	
Total Depth (ft):	265	Static Depth to Water (ft):	120 NM	Well diameter (in):	5.5
Purge Volume (gal)	615				

Weather Conditions			
Sky:	Clear / Scattered / Cloudy / Overcast	Estimated Air Temp (deg F):	45
Precipitation:	None / Light / Moderate / Heavy	Precip Type:	None / Rain / Sleet / Hail / Snow
Wind:	Calm / Light / Mod / Strong	Wind Speed/Direction:	0

Field Measurements

Parameter	Units	Reading	Time	Flag Code	Instrument	In-situ or Container	Comments
Water Temp	deg C	12.50	1229		YSI 556	Container	
pH	s.u.	7.16					
Sp. Conductivity	uS/cm	757					
Conductivity	uS/cm	576					
DO Saturation	%	54.4					
DO	mg/L	5.75					
Baro Press	mmHg	611.7					
ORP	RmV	97.1					
Turbidity	NTU	4.90		AV	MicroTPI		4.94, 4.68, 5.07
Discharge	gpm	10	1015	J	5gal Bucket		5gal/27.4sec
H2S	mg/L	NM					

Color:	Clear / White / Yellow / Brown / Green / Blue / Other	Light / Med / Dark	
Odor:	None / Mild / Mod / Strong		
Effervescence:	None / Mild / Mod / Strong	Bubbles:	None / Low / Mod / High
Sediment:	None / Light / Mod / Heavy	VOA Headspace:	None / ≤ Pea Size / ≥ Pea Size
Lab Analysis:	Rule 609 / COA 9 / COA 22 / Other		
Field Filtered:	Yes / No	Filter Size: N/A	No. Filters used: 0

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 Groundwater Monitoring Field Form

Landowner Comments on water quality:

None

Additional information:

Calibration Information			Date: 10-17-13			Location: Office		
Instrument	Parameter	Units	Time	Calibration Standard Value	Calibration Standard Temp (°C)	Instrument Reading of Standard	Adjusted Reading	Comments
YSI 556	pH	s.u.	737	7.00	22.22	7.02	7.00	
	pH	s.u.	739	10.01	22.19	10.00	10.01	
	pH	s.u.	742	4.01	22.18	4.00	4.01	
	SpC	uS/cm	~~725~~	~~8974~~	~~22.18~~	~~5324~~		Cancelled Cal
	SpC	uS/cm	734	8974	22.16	8982	8974	
	DO	%	750		22.22	85.8	84.6	643.1 mmHg
	DO	%						
	ORP	RmV						
~~240~~ Micro Tpl	Turbidity	NTU	740					

WPX BWQ Groundwater Monitoring Field Form

Well Purging Information

Date: 10-17-13	Purge Method: Stable Parameters	
Total Depth, ft (d_t): 265	Static Depth to Water, ft (d_w): 120 NM	Sample/Set Depth (ft): Q
Bore Radius (in): 3.25	Bore Volume (ft^3): Q	Casing Radius (in): 2.75
Total Volume (gal) or ft^3): 249.416		Total Volume x 3 (gal or ft^3): 748.38

1 ft^3 = 7.48 gal

Bore Volume = $\pi r^2(d_t-d_w)$ $\pi(3.25)^2(265-120) = 0.23(145) = 33.35 ft^3 = 249.46$

$33.17(145) = 4,809.65$

Purge #	Time	pH (s.u.)	SpC (uS/cm)	Cond (uS/cm)	DO (%)	DO (mg/L)	ORP (RmV)	Water Clarity (Poor/Mod / Good) NTU	Effervescence (None /Slight/ Mod/Heavy)	Volume Purged (gal)	Cum Vol Purged (gal)
temp											
1	1035	7.03	748	569	27.8	2.95	156.8	23.32	None	~~15~~ 35	~~15~~ 35
2	1038	6.92	746	566	29.8	3.16	143.6	20.13	None	~~10~~ 30	~~25~~ 65
3	1041	6.95	747	566	33.1	3.50	109.2	14.48	None	30	95
4	1044	6.97	746	565	33.6	3.58	77.8	15.26	None	30	125
5	1047	6.99	744	564	36.3	3.87	47.2	14.70	None	30	155
6	1050	7.10	743	563	36.1	3.81	28.5	16.79	None	30	185
7	1053	7.17	745	565	44.0	4.68	14.3	18.20	None	30	205
8	1056	7.22	749	568	44.1	4.63	4.1	21.83	None	30	235
9	1059	7.27	753	572	46.5	4.91	-1.8	32.70	None	30	265
10	1102	7.29	755	573	50.0	5.31	-5.4	62.48	None	30	295
11	1105	7.29	755	573	51.6	5.48	-4.0	60.16	None	30	325
12	1108	7.31	756	575	53.3	5.66	-5.4	65.41	None	30	325
13	1111	7.32	757	576	55.2	5.77	-1.8	82.15	None	30	355
14	1115	7.34	758	577	59.6	6.31	1.6	99.14	None	30	385
15	1118	7.34	760	578	61.2	6.50	14.1	61.54	None	30	415
16	1121	7.35	761	580	61.8	6.53	20.7	86.84	None	30	445
17	1124	7.34	762	579	66.1	7.00	22.1	185.9	None		
18	1126	Pumped dry			no parameters taken					20	465
19	1157	7.37	759	584	59.0	6.18	55.0	20.16	None	30	495
20	1200	7.39	764	583	64.2	6.77	57.1	7.35	None	30	525
21	1203	7.38	765	583	65.2	6.90	60.8	6.57	None	30	555
22	1206	7.36	766	584	64.3	6.80	65.4	5.32	None	30	585
23	1209	7.35	766	584	62.8	6.64	65.0	6.10	None	30	615

.67 / 100

~~1746.22~~

ATTACHMENT C

Data Quality Review Sheets

DATA QUALITY REVIEW SHEET

Facility ID:	703063	Project:	BWQ: GV 86-2
Station Name:	Firth 112927	Lab Work Order:	1310347-1
Sample Date:	10/21/13	QA/QC Review Date:	12-11-13
Field Sample ID:	Firth 112927	Reviewer:	J. Pahler

Field Sampling Data Review	**Yes**	**No**	**N/A**
1. Well properly purged?	☐	☒	☐
2. Flow rate reduced prior to sampling?	☒	☐	☐
3. Water quality parameters stable prior to sampling?	☒	☐	☐
4. Field instruments calibrated properly?	☒	☐	☐
5. Sampling methods performed according to SAP procedures?	☒	☐	☐
6. Procedures consistent with obtaining a representative sample?	☒	☐	☐
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	☒	☐	☐
8. Any discrepancies noted on the lab receipt form? *If yes, list in the comments section.*	☐	☒	☐
9. All samples analyzed for the requested analyses?	☒	☐	☐
10. Proper laboratory methods used?	☒	☐	☐
11. All sample holding times met?	☐	☒	☐
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	☒	☐	☐
13. Was a field investigation sample used by the lab for matrix QC for all analyses?	☐	☒	☐
14. Lab qualifiers for data (other than non-detect)? *List in comments*.	☒	☐	☐
15. Are corrective actions required? *If yes, please list actions and dates to be completed by:*	☐	☒	☐
Corrective Action	*Date to be completed*		

Calculated Parameters	**Calculated Value**	**Lab Value**	**Ratio/Percent Difference**	**Acceptable Limit**	**Meets QC Criteria?**
Cation/Anion Balance, % (CAB)	3.663	4.613		±5%	☐
Total Dissolved Solids, mg/L (TDS)	481	390	1.24	0.8 – 1.2	☐
Specific Conductance, µS/cm (SpC)	582	635	0.92	0.8 – 1.2	☐

Comments:

Well only purged 10 minutes at request of well owner. VOC Analysis: LCS and LCSD used instead of MS and MSD due to insufficient sample. GRO was detected in the Trip Blank between the MDL and RL; lab qualified result with "J" to indicate estimated value. Metals: matrix spike recoveries could not be evaluated for sodium and strontium in the MS and MSD due to concentrations in native sample being greater than four times the amount of spike added. Method for TDS analyses incorrectly entered as EPA 160.1; was actually SM 4500C. Field sample had moderate effervescence and contained small headspace >pea size, but not present when received at laboratory. Because the lab did not select a field investigation sample from this job for matrix QC for inorganics, the similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC. Lab pH analyzed out of holding time; WWL qualified with "H" to indicate results estimated.

DATA QUALITY REVIEW SHEET

Facility ID:	704671	Project:	BWQ: GV 86-2
Station Name:	Mitchell Water Well	Lab Work Order:	1310292-1
Sample Date:	10/16/13	QA/QC Review Date:	11/22/13
Field Sample ID:	Mitchell 149891	Reviewer:	J. Pahler

Field Sampling Data Review	**Yes**	**No**	**N/A**
1. Well properly purged?	☒	☐	☐
2. Flow rate reduced prior to sampling?	☒	☐	☐
3. Water quality parameters stable prior to sampling?	☐	☒	☐
4. Field instruments calibrated properly?	☒	☐	☐
5. Sampling methods performed according to SAP procedures?	☒	☐	☐
6. Procedures consistent with obtaining a representative sample?	☒	☐	☐
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	☒	☐	☐
8. Any discrepancies noted on the lab receipt form? *If yes, list in the comments section.*	☐	☒	☐
9. All samples analyzed for the requested analyses?	☒	☐	☐
10. Proper laboratory methods used?	☒	☐	☐
11. All sample holding times met?	☐	☒	☐
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	☒	☐	☐
13. Was a field investigation sample used by the lab for matrix QC for all analyses?	☐	☒	☐
14. Lab qualifiers for data (other than non-detect)? *List in comments*.	☒	☐	☐
15. Are corrective actions required? *If yes, please list actions and dates to be completed by:*	☐	☒	☐
Corrective Action	*Date to be completed*		

Calculated Parameters	**Calculated Value**	**Lab Value**	**Ratio/Percent Difference**	**Acceptable Limit**	**Meets QC Criteria?**
Cation/Anion Balance, % (CAB)	6.501	6.777		±5%	☐
Total Dissolved Solids, mg/L (TDS)	424	350	1.21	0.8 – 1.2	☐
Specific Conductance, µS/cm (SpC)	522	570	0.92	0.8 – 1.2	☐

Comments:

Field parameters not stabilized after purging 7 casing volumes. Sample collected according to SAP procedures. The lab did not select a field investigation sample from this job for matrix QC for metals and inorganics. The similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

Lab pH analyzed out of holding time; WWL qualified with “H” to indicate results estimated.

DATA QUALITY REVIEW SHEET

Facility ID:	703035	Project:	BWQ: GV 86-2
Station Name:	Rice, John	Lab Work Order:	1310387-1
Sample Date:	10/22/13	QA/QC Review Date:	11-22-13
Field Sample ID:	Rice-Well	Reviewer:	J. Pahler

Field Sampling Data Review	**Yes**	**No**	**N/A**
1. Well properly purged?	☒	☐	☐
2. Flow rate reduced prior to sampling?	☒	☐	☐
3. Water quality parameters stable prior to sampling?	☐	☒	☐
4. Field instruments calibrated properly?	☒	☐	☐
5. Sampling methods performed according to SAP procedures?	☒	☐	☐
6. Procedures consistent with obtaining a representative sample?	☒	☐	☐
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	☒	☐	☐
8. Any discrepancies noted on the lab receipt form? *If yes, list in the comments section.*	☐	☒	☐
9. All samples analyzed for the requested analyses?	☒	☐	☐
10. Proper laboratory methods used?	☒	☐	☐
11. All sample holding times met?	☐	☒	☐
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	☒	☐	☐
13. Was a field investigation sample used by the lab for matrix QC for all analyses?	☐	☒	☐
14. Lab qualifiers for data (other than non-detect)? *List in comments*.	☒	☐	☐
15. Are corrective actions required? *If yes, please list actions and dates to be completed by:*	☐	☒	☐
Corrective Action	*Date to be completed*		

Calculated Parameters	**Calculated Value**	**Lab Value**	**Ratio/Percent Difference**	**Acceptable Limit**	**Meets QC Criteria?**
Cation/Anion Balance, % (CAB)	2.152	3.317		±5%	☒
Total Dissolved Solids, mg/L (TDS)	492	410	1.24	0.8 – 1.2	☐
Specific Conductance, µS/cm (SpC)	612	665	0.92	0.8 – 1.2	☒

Comments:

Field parameters stable with the exception of ORP (± 13 mv). Analytic method for TDS was incorrectly entered in EDD as EPA 160.1; actual method used was SM 4500C. GRO was detected in the Trip Blank at 260 ug/L; lab investigation revealed contamination in the sample from the VOC vial (septa) manufacturing process. WWL rejected the data and qualified with an "R". LCS and LCSD were used instead of MS and MSD for VOCs due to insufficient sample. The lab did not select a field investigation sample from this job for matrix QC for metals and inorganics. The similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

Lab pH analyzed out of holding time; WWL qualified with "H" to indicate results estimated.

DATA QUALITY REVIEW SHEET

Facility ID:	752941	Project:	BWQ: GV 86-2
Station Name:	Schuette 273609	Lab Work Order:	1310307-1
Sample Date:	10/17/13	QA/QC Review Date:	11/22/13
Field Sample ID:	Schuette-273609	Reviewer:	J. Pahler

Field Sampling Data Review	**Yes**	**No**	**N/A**
1. Well properly purged?	☒	☐	☐
2. Flow rate reduced prior to sampling?	☒	☐	☐
3. Water quality parameters stable prior to sampling?	☒	☐	☐
4. Field instruments calibrated properly?	☒	☐	☐
5. Sampling methods performed according to SAP procedures?	☒	☐	☐
6. Procedures consistent with obtaining a representative sample?	☒	☐	☐
Lab Data Report Review			
7. Proper sample custody maintained until laboratory receipt?	☒	☐	☐
8. Any discrepancies noted on the lab receipt form? *If yes, list in the comments section.*	☐	☒	☐
9. All samples analyzed for the requested analyses?	☒	☐	☐
10. Proper laboratory methods used?	☒	☐	☐
11. All sample holding times met?	☒	☐	☐
12. Lab QA samples (e.g., matrix spikes and matrix spike duplicates) collected and analyzed according to lab method and results within method acceptance limits?	☒	☐	☐
13. Was a field investigation sample used by the lab for matrix QC for all analyses?	☐	☒	☐
14. Lab qualifiers for data (other than non-detect)? *List in comments*.	☒	☐	☐
15. Are corrective actions required? *If yes, please list actions and dates to be completed by:*	☐	☒	☐
Corrective Action	*Date to be completed*		

Calculated Parameters	**Calculated Value**	**Lab Value**	**Ratio/Percent Difference**	**Acceptable Limit**	**Meets QC Criteria?**
Cation/Anion Balance, % (CAB)	5.896	6.26	1.06	±5%	☐
Total Dissolved Solids, mg/L (TDS)	568	460	1.24	0.8 – 1.2	☐
Specific Conductance, µS/cm (SpC)	687	758	0.91	0.8 – 1.2	☐

Comments:

VOC Analysis: LCS and LCSD used instead of MS and MSD due to insufficient sample. The lab did not select a field investigation sample from this job for matrix QC for DRO, metals, and some inorganics. The similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

Lab pH analyzed out of holding time; WWL qualified with "H" to indicate results estimated.

ATTACHMENT D

Summary of Analytical Results

Rule 609 BWQ Analytical Results Summary: Well Pad GV 86-2																										
Station Name			**Firth 112927**						**Mitchell Water Well**						**Rice, John**						**Schuette 273609**					
Facility ID			**703063**						**704671**						**703035**						**752941**					
Sample Date			**10/21/2013 9:42**						**10/16/2013 12:35**						**10/22/2013 15:08**						**10/17/2013 12:16**					
Field Sample ID			**Firth 112927**						**Mitchell 149891**						**Rice-Well**						**Schuette-273609**					
Lab Sample ID			**1310347-1**						**1310292-1**						**1310387-1**						**1310307-1**					
	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**	**Result**	**Lab Qual**	**WWL Qual**	**RL**	**MDL**	**DF**
Inorganics																										
Alkalinity AS CaCO3, Total	mg/l	SM2320B	330			20		1	280			20		1	330			20		1	390			20		1
Alkalinity, Bicarbonate as CaCO3	mg/l	SM2320B	330			20		1	280			20		1	330			20		1	390			20		1
Alkalinity, Carbonate as CaCO3	mg/l	SM2320B	20	U		20		1	20	U		20		1	20	U		20		1	20	U		20		1
Bromide	mg/l	EPA300.0	0.2	U		0.2	0.06	1	0.2	U		0.2	0.06	1	0.2	U		0.2	0.06	1	0.2	U		0.2	0.06	1
Chloride	mg/l	EPA300.0	6.5			0.2	0.06	1	2.7			0.2	0.06	1	11			0.2	0.06	1	4.5			0.2	0.06	1
Fluoride	mg/l	EPA300.0	0.25			0.1	0.03	1	0.4			0.1	0.03	1	0.2			0.1	0.03	1	0.21			0.1	0.03	1
Nitrate as N	mg/l	EPA300.0	1.3			0.2	0.06	1	0.89			0.2	0.06	1	0.72			0.2	0.06	1	1.8			0.2	0.06	1
Nitrate/Nitrite as N	mg/l	Calculation	1.3			0.1		1	0.89			0.1		1	0.72			0.1		1	1.8			0.1		1
Nitrite as N	mg/l	EPA300.0	0.1	U		0.1	0.03	1	0.1	U		0.1	0.03	1	0.1	U		0.1	0.03	1	0.1	U		0.1	0.03	1
pH	s.u.	SM4500-H	7.88		H	0.1		1	8.14		H	0.1		1	8.05		H	0.1		1	7.91		H	0.1		1
Specific Conductivity	umhos/cm	SM2510B	635			1		1	570			1		1	665			1		1	758			1		1
Sulfate	mg/l	EPA300.0	20			1	0.3	1	34			1	0.3	1	13			1	0.3	1	33			1	0.3	1
Total Dissolved Solids	mg/l	SM2540C	390			20		1	350			20		1	410			20		1	460			20		1
Total Phosphorous	mg/l	EPA365.2	0.05	U		0.05	0.015	1	0.066			0.05	0.015	1	0.05	U		0.05	0.015	1	0.05	U		0.05	0.015	1
Dissolved Metals																										
Barium	ug/l	EPA200.8	92			1	0.3	10	41			1	0.3	10	79			1	0.3	10	120			1	0.3	10
Boron	ug/l	EPA200.8	110			50	15	10	72			50	15	10	130			50	15	10	78			50	15	10
Calcium	ug/l	EPA200.8	26000			1000	65	10	15000			1000	65	10	12000			1000	65	10	39000			1000	65	10
Iron	ug/l	EPA200.8	100	U		100	30	10	100	U		100	30	10	100	U		100	30	10	100	U		100	30	10
Magnesium	ug/l	EPA200.8	31000			100	30	10	25000			100	30	10	23000			100	30	10	37000			100	30	10
Manganese	ug/l	EPA200.8	2	U		2	0.6	10	2	U		2	0.6	10	2	U		2	0.6	10	4			2	0.6	10
Potassium	ug/l	EPA200.8	1800			1000	300	10	1400			1000	300	10	1800			1000	300	10	1100			1000	300	10
Selenium	ug/l	EPA200.8	1	U		1	0.5	10	1	U		1	0.5	10	1	U		1	0.5	10	1	U		1	0.5	10
Sodium	ug/l	EPA200.8	65000			1000	300	10	64000			1000	300	10	100000			1000	300	10	61000			1000	300	10
Strontium	ug/l	EPA200.8	670			1	0.3	10	450			1	0.3	10	540			1	0.3	10	720			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	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	30	1	100	U		100	30	1	100	U		100	30	1	100	U		100	30	1
Dissolved Gases																										
Ethane	ug/l	RSK175	2	U		2	2	1	2	U		2	2	1	2	U		2	2	1	2	U		2	2	1
Methane	ug/l	RSK175	1	U		1	1	1	1	U		1	1	1	1	U		1	1	1	1	U		1	1	1
Propane	ug/l	RSK175	1	U		1	1	1	1	U		1	1	1	1	U		1	1	1	1	U		1	1	1

Rule 609 BWQ Analytical Results Summary: Well Pad GV 86-2																										
Station Name			**Firth 112927**						**Mitchell Water Well**						**Rice, John**						**Schuette 273609**					
Facility ID			**703063**						**704671**						**703035**						**752941**					
Sample Date			**10/21/2013 9:42**						**10/16/2013 12:35**						**10/22/2013 15:08**						**10/17/2013 12:16**					
Field Sample ID			**Firth 112927**						**Mitchell 149891**						**Rice-Well**						**Schuette-273609**					
Lab Sample ID			**1310347-1**						**1310292-1**						**1310387-1**						**1310307-1**					
	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**	**Result**	**Lab Qual**	**WWL Qual**	**RL**	**MDL**	**DF**
VOAs																										
Benzene	ug/l	SW8260_25	1	U		1	0.3	1	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	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	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	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	1	U		1	0.3	1
Xylenes (Total)	ug/l	Calculation	1	U		1		1	1	U		1		1	1	U		1		1	1	U		1		1
Bacteria [1]																										
Iron Related Bacteria	nu	BART	1			1		1	1			1		1	1			1		1	1			1		1
Slime forming bacteria	nu	BART	0	U		1		1	0	U		1		1	0	U		1		1	1			1		1
Sulfate Reducing Bacteria	nu	BART	0	U		1		1	0	U		1		1	0	U		1		1	0	U		1		1
Field_Parameters																										
Bubbles	nu	Field	None					1	None					1	None					1	None					1
Color	nu	Field	Clear					1	Clear					1	Clear					1	Clear					1
Conductivity, Field	uS/cm	Field	492					1	414					1	505					1	576					1
Discharge, measured	gpm	Field	4.2					1	6					1	15					1	10					1
Dissolved Oxygen, Field	mg/l	Field	6.87					1	7.06					1	7.14					1	5.75					1
Dissolved Oxygen, Field,%	%	Field	64.8					1	63.8					1	66.7					1	54.4					1
Effervescence	nu	Field	Mild					1	Mild					1	Mild					1	None					1
Odor	nu	Field	None					1	None					1	None					1	None					1
ORP, field	mv	Field	221					1	185.9					1	209.1					1	97.1					1
pH, Field	s.u.	Field	7.29					1	7.88					1	7.82					1	7.16					1
Sediment	nu	Field	None						Light						Light						Light					
Specific Conductivity, Field	uS/cm	Field	648					1	571					1	677					1	757					1
Temperature, Water	Deg C	Field	12.29					1	10.59					1	11.66					1	12.5					1
Turbidity, field	NTUs	Field	9.26					1	27.95					1	1.68					1	4.9					1
VOA Headspace	nu	Field	None						None						≤ pea size						None					

Notes:

[1] A result of 1 indicates the presence of bacteria

U = not detected at the reporting limit

NM = not measured

J = result between RL and MDL, estimated

NA = not applicable

R = data rejected

Rule 609 BWQ Analytical Results Summary: Well Pad GV																											
Station Name			**Trip Blank**						**Trip Blank**						**Trip Blank**						**Trip Blank**					
Facility ID			**703035**						**703063**						**704671**						**752941**					
Sample Date			**10/22/2013 0:00**						**10/21/2013 0:00**						**10/16/2013 0:00**						**10/17/2013 0:00**					
Field Sample ID			**Trip Blank**						**Trip Blank**						**Trip Blank**						**Trip Blank**					
Lab Sample ID			**1310387-2**						**1310347-3**						**1310292-2**						**1310307-2**					
	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**	**Result**	**Lab Qual**	**WWL Qual**	**RL**	**MDL**	**DF**
Inorganics																										
Alkalinity AS CaCO3, Total	mg/l	SM2320B																								
Alkalinity, Bicarbonate as CaCO3	mg/l	SM2320B																								
Alkalinity, Carbonate as CaCO3	mg/l	SM2320B																								
Bromide	mg/l	EPA300.0																								
Chloride	mg/l	EPA300.0																								
Fluoride	mg/l	EPA300.0																								
Nitrate as N	mg/l	EPA300.0																								
Nitrate/Nitrite as N	mg/l	Calculation																								
Nitrite as N	mg/l	EPA300.0																								
pH	s.u.	SM4500-H																								
Specific Conductivity	umhos/cm	SM2510B																								
Sulfate	mg/l	EPA300.0																								
Total Dissolved Solids	mg/l	SM2540C																								
Total Phosphorous	mg/l	EPA365.2																								
Dissolved Metals																										
Barium	ug/l	EPA200.8																								
Boron	ug/l	EPA200.8																								
Calcium	ug/l	EPA200.8																								
Iron	ug/l	EPA200.8																								
Magnesium	ug/l	EPA200.8																								
Manganese	ug/l	EPA200.8																								
Potassium	ug/l	EPA200.8																								
Selenium	ug/l	EPA200.8																								
Sodium	ug/l	EPA200.8																								
Strontium	ug/l	EPA200.8																								
Organics																										
Diesel Range Organics	mg/l	SW8015M																								
Gasoline Range Organics	ug/l	SW8260_25	260		R	100	30	1	64	J		100	30	1	100	U		100	30	1	100	U		100	30	1
Dissolved Gases																										
Ethane	ug/l	RSK175																								
Methane	ug/l	RSK175																								
Propane	ug/l	RSK175																								

Rule 609 BWQ Analytical Results Summary: Well Pad GV																											
Station Name			**Trip Blank**						**Trip Blank**						**Trip Blank**						**Trip Blank**					
Facility ID			**703035**						**703063**						**704671**						**752941**					
Sample Date			**10/22/2013 0:00**						**10/21/2013 0:00**						**10/16/2013 0:00**						**10/17/2013 0:00**					
Field Sample ID			**Trip Blank**						**Trip Blank**						**Trip Blank**						**Trip Blank**					
Lab Sample ID			**1310387-2**						**1310347-3**						**1310292-2**						**1310307-2**					
	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**	**Result**	**Lab Qual**	**WWL Qual**	**RL**	**MDL**	**DF**
VOAs																										
Benzene	ug/l	SW8260_25	1	U		1	0.3	1	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	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	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	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	1	U		1	0.3	1
Xylenes (Total)	ug/l	Calculation	1	U		1		1	1	U		1		1	1	U		1		1	1	U		1		1
Bacteria [1]																										
Iron Related Bacteria	nu	BART																								
Slime forming bacteria	nu	BART																								
Sulfate Reducing Bacteria	nu	BART																								
Field_Parameters																										
Bubbles	nu	Field																								
Color	nu	Field																								
Conductivity, Field	uS/cm	Field																								
Discharge, measured	gpm	Field																								
Dissolved Oxygen, Field	mg/l	Field																								
Dissolved Oxygen, Field,%	%	Field																								
Effervescence	nu	Field																								
Odor	nu	Field																								
ORP, field	mv	Field																								
pH, Field	s.u.	Field																								
Sediment	nu	Field																								
Specific Conductivity, Field	uS/cm	Field																								
Temperature, Water	Deg C	Field																								
Turbidity, field	NTUs	Field																								
VOA Headspace	nu	Field																								

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