WATER QUALITY SAMPLING
2020

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

February 11, 2021

Jerry Henderson
Colorado Department of Public
Health and Environment
HMWMD
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

Re: 2020 Annual Groundwater Monitoring Report
Keenesburg Ash Disposal Site
Weld County, Colorado

Dear Mr. Henderson

This groundwater monitoring report describes the groundwater monitoring activities performed at the Keenesburg Ash Disposal Site (the facility) in 2020. Sampling was conducted by American Environmental Consulting, LLC (AEC) in accordance with the August 5, 2018 Post-Closure Care Plan (PCCP) and the August 5, 2018 Post-Closure Groundwater Monitoring Plan (GMP). This the second annual post-closure groundwater monitoring report, and it is the first post-closure groundwater monitoring report covering a complete calendar year.

Please feel free to call of email me with any questions.

Respectfully,

AMERICAN ENVIRONMENTAL CONSULTING, LLC

Michael Bucari-Tovo, P.G.
Senior Geologist

Reviewed by:

Curtis Ahrendsen
Project Manager

cc: Ben Moline, Coors Energy

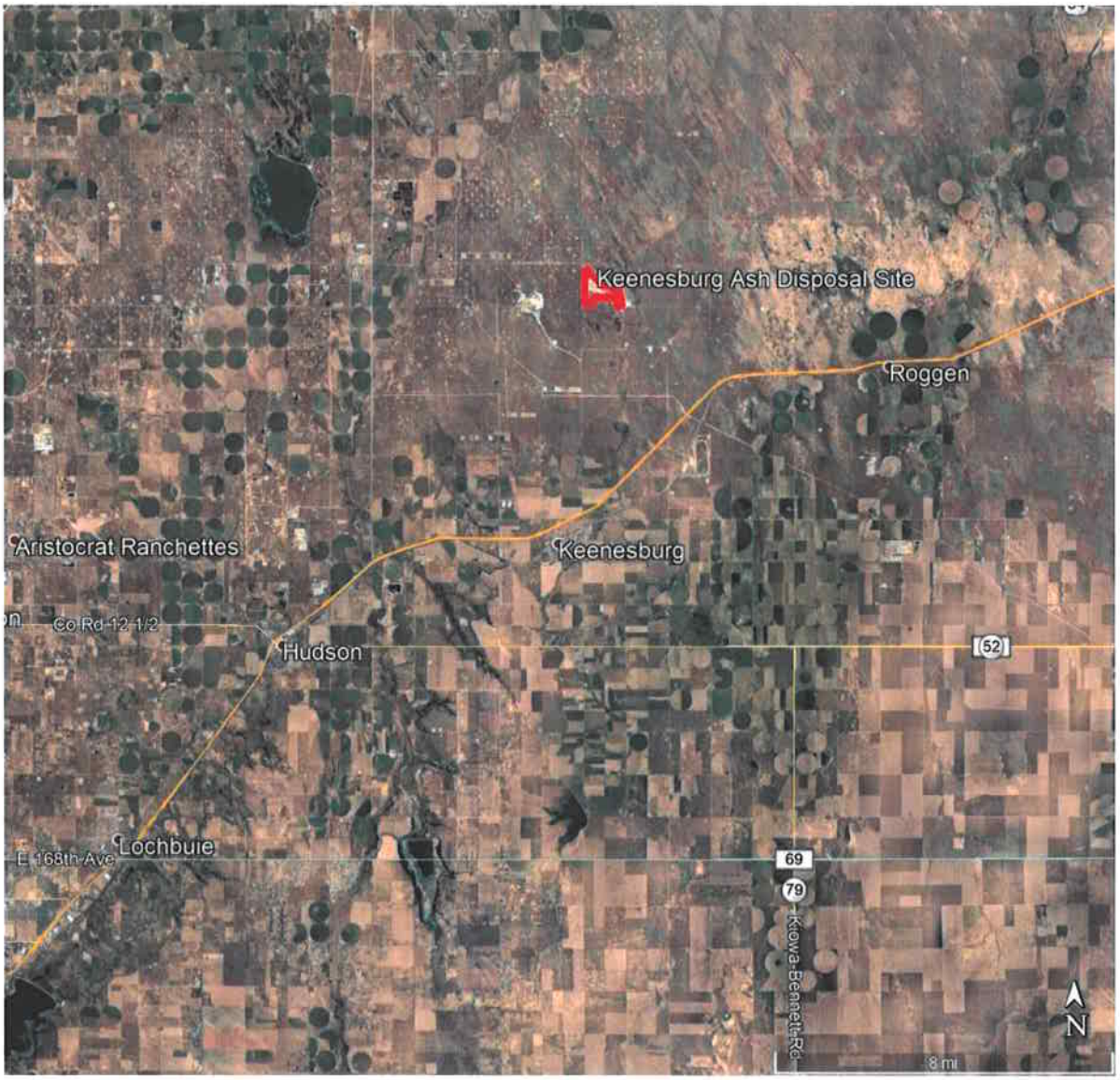
1.0 INTRODUCTION

The site is located approximately 4.5 miles north of Keenesburg (Figure 1) in portions of Sections 25 and 36, Township 3 North, Range 64 West, Sixth Principal Meridian, Weld County, Colorado (Figure 2). The area included in the permit allowing both mining and disposal operations is approximately 788.5 acres. Only 413 acres were actually disturbed by mining activities. Ash disposal occurred in two pits (the A-Pit and B-Pit) totaling about 65.6 acres.

The property was a surface coal mine (with associated support operations) from 1981 through 1987. Disposal of ash began in 1987 as part of the mine reclamation process. The site is permitted to dispose of fly and bottom ash from the coal-fired power plant located at the Molson Coors Brewing complex in Golden, Colorado. The facility also accepted waste rock from other mines on a case-by-case basis. The approved operations plan also allows demolition and disposal of on-site facilities such as the shop/office building.

The facility began post-closure groundwater monitoring in the 4th Quarter of 2020 in accordance with the PCCP and GMP. Under the GMP, water levels will be measured quarterly and sampled semiannually. In accordance with the PCCP, four new groundwater monitoring wells were installed at the facility in July 2019: PC-1, PC-2, PC-5 and PC-6. These new wells were sampled for the first time during the 4th Quarter 2019 groundwater monitoring event. Statistical analysis of the facility's groundwater will begin after the new wells have been sampled eight times.

FIGURE 1
SITE LOCATION MAP



2.0 SAMPLING

All seven monitoring wells in the post-closure monitoring network were sampled by AEC twice in 2020. The first 2020 semiannual sampling event was conducted on April 23 & 24, 2020, and the second sampling event was conducted on September 22 & 23, 2020. All sampling activities were performed by AEC in accordance with the GMP procedures.

Upon arriving at each monitoring well, the sampling technician first measured the static water levels and recorded the measurements on the field forms. The technician then purged the wells using the dedicated 12V pumps. At wells with adequate recharge, three wellbore storage volumes were purged prior to sampling. Wells with poor recharge were purged until dry and then sampled the following day. After each wellbore storage volume was purged, the technician measured the purged water's pH, temperature and conductivity using a portable meter that was calibrated that day. The technician recorded the water level, total volume of water purged, and field parameter measurements onto field sampling forms which are included in Attachment 1.

After each well was purged, the technician collected groundwater samples into new sample containers, containing appropriate preservatives, provided by Pace Analytical. A duplicate sample was collected from AMW-2 during the April monitoring event and from SMW-2 during the September monitoring event. All sample containers were labeled with the well name, the date and time collected, the analyses to be performed, the preservative used (if any), and the sampler's initials. The sample containers were immediately sealed and placed on ice in a cooler after collection. A chain of custody form (COC) was provided by the laboratory. The technician added each sample to the COC, along with the date and time it was collected, and the analyses to be performed.

After the last samples were collected on the second day of sampling during each monitoring event, the coolers were filled with fresh ice and sealed with the COCs inside. The coolers were shipped via FedEx™ overnight to the Pace Analytical laboratory in Mount Juliet, TN.

3.0 GROUNDWATER HYDROLOGY

The groundwater monitoring network at the facility is made up of seven wells: PC-1, PC-2, PC-5, PC-6, AMW-1, AMW-2, and SMW-2, and water levels in in these wells are measured quarterly. The field technician measured the depths to water in each well using an electronic water level indicator, and he decontaminated the indicator between each well. Table 1 shows the depth to groundwater measurements and static water elevations during each quarterly water level monitoring event.

TABLE 1
2020 QUARTERLY WATER LEVELS

Well	Top of Casing Elev.	3/31/2020		4/23/2020		9/22/2020		11/3/2020	
		Depth	Elev.	Depth	Elev.	Depth	Elev.	Depth	Elev.
AMW-1	4,804.55	27.87	4,776.68	28.00	4,776.55	27.76	4,776.79	27.52	4,777.03
AMW-2	4,808.88	25.85	4,783.03	25.80	4,783.08	25.59	4,783.29	25.52	4,783.36
PC-1	4,830.46	23.60	4,806.86	23.48	4,806.98	22.97	4,807.49	22.77	4,807.69
PC-2	4,819.29	38.05	4,781.24	37.96	4,781.33	37.78	4,781.51	37.84	4,781.45
PC-5	4,803.16	33.89	4,769.27	33.70	4,769.46	33.61	4,769.55	33.51	4,769.65
PC-6	4,798.63	27.41	4,771.22	27.37	4,771.26	26.78	4,771.85	26.73	4,771.90
SMW-2	4,803.80	34.27	4,769.53	34.25	4,769.55	34.18	4,769.62	34.16	4,769.64

Notes: Elevation is feet above mean sea level.
Depth measured in feet from top of casing.

AEC constructed groundwater potentiometric surface maps for each monitoring quarter in 2020 using the groundwater elevations from Table 1. Additionally, water levels were voluntarily measured in well SMW-1 during the 1st and 3rd Quarter monitoring events, and those measurements were included in those potentiometric surface maps. The potentiometric surface maps are included in Attachment 2 and are labeled Figure 2-1 through 2-4.

All four of the 2020 maps are substantially similar, and they show groundwater generally flowing east to north-northeast beneath the facility. Near the A-Pit, groundwater flows north-northeast at a gradient of approximately 2.2% to 2.3%, from PC-1 to AMW-2. Near the B-Pit, groundwater flows east at a gradient of approximately 0.72% to 0.73%, from PC-2 to PC-5. The observed quarterly groundwater gradients beneath each pit are shown in Table 2 on the following page.

Groundwater flow velocities beneath both the A-Pit and B-Pit were calculated using the formula from the GMP. The GMP lists the average hydraulic conductivity beneath the site as $3x10^{-5}$ cm/s and the porosity as 0.1; however, the actual hydraulic gradient likely varies widely across the site. The formula provided in the GMP for calculating groundwater flow velocity is:

$$V_S = 2830\frac{Ki}{n_e}$$

Where:

V_s	=	groundwater seepage velocity (ft/day)
K	=	hydraulic conductivity (cm/s)
i	=	hydraulic gradient (dimensionless)
n_e	=	effective porosity (dimensionless)
2830	=	unit conversion factor ((s*ft)/(cm*day))

Using that formula, AEC calculated the groundwater flow velocity beneath both the A-Pit and B-Pit for each of the 2020 quarterly water level monitoring events, and the results are shown in Table 2 below.

TABLE 2
2020 QUARTERLY GROUNDWATER FLOW VELOCITIES

Monitoring Quarter	Pit	Gradient	Veolcity	
			(ft/day)	(ft/year)
1st Quarter	A-Pit	2.24%	0.0190	6.9
	B-Pit	0.725%	0.00616	2.2
2nd Quarter	A-Pit	2.21%	0.0188	6.8
	B-Pit	0.720%	0.00611	2.2
3rd Quarter	A-Pit	2.22%	0.0188	6.9
	B-Pit	0.723%	0.00614	2.2
4th Quarter	A-Pit	2.25%	0.0191	7.0
	B-Pit	0.717%	0.00609	2.2

4.0 LABORATORY RESULTS

The samples collected by AEC for the April monitoring event were received by Pace Analytical on April 25, 2020, and the September monitoring event samples were received by Pace Analytical on September 24, 2020. The laboratory noted that all samples were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times for both 2020 monitoring events. Duplicate samples were collected from AMW-2 during the April 2020 event and from SMW-2 during the September 2020 monitoring event. Table 3 shows the analytical results from the primary and duplicate samples and the relative percent difference (RPD) between them for both 2020 monitoring events. The primary and duplicate samples showed good agreement for both monitoring events, with nearly all parameters differing by less than 10%.

TABLE 3
PRIMARY AND DUPLICATE SAMPLE RESULTS AND COMPARISON

Analyte	Apr-20			Sep-20		
	AMW-2	DUP	RPD	SMW-2	DUP	RPD
Sodium Adsorption Ratio	15.1	14.9	1%	15.8	15.8	0%
Hardness (calculated) as CaCO3	2010	1960	3%	1980	1960	1%
Dissolved Solids	6770	6830	1%	6460	6860	6%
Alkalinity, Bicarbonate	762	752	1%	1020	1020	0%
Alkalinity, Carbonate	<20	<20	0%	<20	<20	0%
Chloride	328	323	2%	740	728	2%
Fluoride	0.293	0.207	34%	0.269	0.283	5%
Sulfate	3490	3420	2%	3260	3200	2%
Antimony, Dissolved	<0.01	<0.01	0%	<0.01	<0.01	0%
Arsenic, Dissolved	<0.01	<0.01	0%	<0.01	<0.01	0%
Barium, Dissolved	0.02	0.0199	1%	0.0112	0.0111	1%
Boron, Dissolved	0.241	0.243	1%	0.341	0.339	1%
Cadmium, Dissolved	<0.002	<0.002	0%	<0.002	<0.002	0%
Calcium	495	486	2%	491	486	1%
Calcium, Dissolved	463	462	0%	521	527	1%
Iron, Dissolved	<0.1	<0.1	0%	<0.1	<0.1	0%
Lead, Dissolved	<0.006	<0.006	0%	<0.006	<0.006	0%
Magnesium	187	182	3%	184	181	2%
Magnesium, Dissolved	176	175	1%	173	175	1%
Manganese, Dissolved	3.38	3.37	0%	0.504	0.485	4%
Molybdenum, Dissolved	<0.005	<0.005	0%	<0.005	<0.005	0%
Potassium, Dissolved	27.9	28	0%	16.3	16.3	0%
Selenium, Dissolved	<0.01	<0.01	0%	0.0126	<0.01	23%
Sodium	1550	1520	2%	1610	1600	1%
Sodium, Dissolved	1490	1480	1%	1550	1580	2%

The complete laboratory analytical reports for both 2020 semiannual water quality sampling events are included in Attachment 2.

5.0 STATISTICAL ANALYSIS

The GMP specifies that the analytical data will be statistically analyzed using interwell prediction limits, which requires a minimum of eight observations in the up-gradient wells (PC-1 and PC-2). As of the end of 2020, only three observations have been collected. Based on the semiannual water quality monitoring schedule, the first statistical analysis will be conducted on the April 2023 observations.

ATTACHMENT 1

FIELD FORMS

ATTACHMENT 1.1

APRIL 2020 FORMS

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: PC-1						
Sampled by: JDA				**Date:** 4/23/20		
Weather during sampling: Clear, calm, 60°F				**Date Sampled:** 4/23/20		
Well Condition: Good				**Time Sampled:** 1100		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 50.15'						
Depth to Groundwater from Measuring Point: 23.48'						
Height of Water Column: 26.67'						
Single Casing/Tubing Volume of Water: 4.3 gal						
Volume of Water to Purge Prior to Sampling: 12.9 gal						
Volume of Water Actually Purged Prior to Sampling: 13 gal				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1 (4g)**	**2 (9g)**	**3 (13g)**	**4**	**5**
pH	**pH units**	7.29	7.26	7.24		
Temperature	**°F**	58.8	57.4	57.7		
Conductance	**mS/cm**	3.97	3.98	3.91		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	Slightly Yellow					
Odor	None					
Appearance	Turbid					
NOTES:						

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: PC-2						
Sampled by: JDA				**Date:** 4/23/20		
Weather during sampling: Windy, Clear, Cool				**Date Sampled:** 4/24/20		
Well Condition: Good				**Time Sampled:** 1020		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 74.78'						
Depth to Groundwater from Measuring Point: 37.96'						
Height of Water Column: 36.82'						
Single Casing/Tubing Volume of Water: 6 gal						
Volume of Water to Purge Prior to Sampling: 18 gal						
Volume of Water Actually Purged Prior to Sampling: 8.25 gal				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 14 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:**			
FIELD PARAMETERS						
	Units	**1 (6g)**	**2 (8.25g)**	**3**	**4**	**5**
pH	**pH units**	6.95	6.83	--		
Temperature	**°F**	59.4	58.4	--		
Conductance	**mS/cm**	12.14	12.30	--		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	clear					
Odor	none					
Appearance	Clear with a slight oil sheen seen during sampling on 4/24					

NOTES:

Well went dry after purging 7.25 gal. Let recharge 24hrs. Recharged to 56.5 feet.

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: PC-5						
Sampled by: JDA				**Date:** 4/23/20		
Weather during sampling: Clear, Windy, 65°F				**Date Sampled:** 4/23/20		
Well Condition: good				**Time Sampled:** 1330		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 50.40'						
Depth to Groundwater from Measuring Point: 33.70'						
Height of Water Column: 16.70'						
Single Casing/Tubing Volume of Water: 2.7 gal						
Volume of Water to Purge Prior to Sampling: 8.3 gal						
Volume of Water Actually Purged Prior to Sampling: 8.5 gal				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1 (3g)**	**2 (6g)**	**3 (8.5g)**	**4**	**5**
pH	**pH units**	6.59	6.62	6.61		
Temperature	**°C**	61.2	58.8	58.8		
Conductance	**mS/cm**	4.30	4.23	4.34		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	Initially Black that turned to Yellow after ~2.5g of purge water					
Odor	Slight rotten egg smell					
Appearance	Slightly turbid					
NOTES:						

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: PC-6						
Sampled by: JDA				**Date:** 4/23/20		
Weather during sampling: Clear, Windy, 65°F				**Date Sampled:** 4/23/20		
Well Condition: good				**Time Sampled:** 1430		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well from Measuring Point: 49.00'						
Depth to Groundwater from Measuring Point: 27.37'						
Height of Water Column: 21.63'						
Single Casing/Tubing Volume of Water: 3.5 gal						
Volume of Water to Purge Prior to Sampling: 10.5 gal						
Volume of Water Actually Purged Prior to Sampling: 11 gal				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 9.27			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 9.27			
FIELD PARAMETERS						
	Units	**1 (4g)**	**2 (8g)**	**3 (11g)**	**4**	**5**
pH	**pH units**	7.47	7.42	7.44		
Temperature	**°F**	62.0	58.0	58.5		
Conductance	**mS/cm**	3.29	3.17	3.23		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	Clear					
Odor	none					
Appearance	Clear					
NOTES:						

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY		**LOCATION: Keenesburg Mine, Keenesburg, Colorado**				
WELL NAME: AMW-1						
Sampled by: JDA				**Date:** 4/24/20		
Weather during sampling: Calm, Clear, Cool				**Date Sampled:** 4/24/20		
Well Condition: Good				**Time Sampled:** 915		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 60'						
Depth to Groundwater from Measuring Point: 28'						
Height of Water Column: 32'						
Single Casing/Tubing Volume of Water: 32.6g						
Volume of Water to Purge Prior to Sampling: 97.9g						
Volume of Water Actually Purged Prior to Sampling: ~100g				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:**			
Method of Sampling/Equipment: 12V Pump			**Voltage:**			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.71	7.76			
Temperature	**°F**	56.2	57.9			
Conductance	**µS/cm**	1.60	2.02			
Turbidity	**NTU/FTU**	-	-			
Color of Groundwater	Slight yellow tint/tan @ sample					
Odor	None					
Appearance	Some organics/very turbid					
NOTES: 5" PVC Well						

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY		**LOCATION: Keenesburg Mine, Keenesburg, Colorado**				
WELL NAME: AMW-2						
Sampled by: JDA			**Date:** 4/23/20			
Weather during sampling: Clear, Windy, Cool			**Date Sampled:** 4/24/20			
Well Condition: Good			**Time Sampled:** 940			
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 53.60'						
Depth to Groundwater from Measuring Point: 25.80'						
Height of Water Column: 27.80'						
Single Casing/Tubing Volume of Water: 41 gal						
Volume of Water to Purge Prior to Sampling: 123 gal						
Volume of Water Actually Purged Prior to Sampling: 65 gal			**Flow Rate:** L/min			
Method of Purging/Equipment: 12V Pump		**Voltage:** 11 V				
Method of Sampling/Equipment: 12V Pump		**Voltage:** 11 V				
FIELD PARAMETERS						
	Units	**1 (40g)**	**2 (60g)**	**3**	**4**	**5**
pH	**pH units**	6.89	6.69			
Temperature	**°F**	63.4	58.9			
Conductance	**mS/cm**	7.89	7.81			
Turbidity	**NTU/FTU**	--	--	--	--	
Color of Groundwater	Yellow					
Odor	None					
Appearance	Turbid					

NOTES:

Started at 11 on 4/23/20
Well went dry after 55 gal.
Let recharge ~23hrs.
Recharged to 39.9'
Collected duplicate

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: SMW-1						
Sampled by:				**Date:**		
Weather during sampling:				**Date Sampled:**		
Well Condition:				**Time Sampled:**		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point:						
Depth to Groundwater from Measuring Point:						
Height of Water Column:						
Single Casing/Tubing Volume of Water:						
Volume of Water to Purge Prior to Sampling:						
Volume of Water Actually Purged Prior to Sampling:				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:**			
Method of Sampling/Equipment: 12V Pump			**Voltage:**			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**					
Temperature	**°C**					
Conductance	**µS/cm**					
Turbidity	**NTU/FTU**					
Color of Groundwater						
Odor						
Appearance						
NOTES:						

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY		**LOCATION: Keenesburg Mine, Keenesburg, Colorado**				
WELL NAME: SMW-2						
Sampled by: JDA				**Date:** 4/24/20		
Weather during sampling: Calm, Clear, Cool				**Date Sampled:** 4/24/20		
Well Condition: Good				**Time Sampled:** 845		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 99'						
Depth to Groundwater from Measuring Point: 34.25'						
Height of Water Column: 54.75'						
Single Casing/Tubing Volume of Water: 60g						
Volume of Water to Purge Prior to Sampling: 180g						
Volume of Water Actually Purged Prior to Sampling: 180g				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:**			
Method of Sampling/Equipment: 12V Pump			**Voltage:**			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.09	7.11			
Temperature	**°F**	54.7	55.8			
Conductance	**µS/cm**	8.61	8.53			
Turbidity	**NTU/FTU**	-	-			
Color of Groundwater	Clear					
Odor	None					
Appearance	Clear					
NOTES: 4.75" PVC Well						

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: DH-122						
Sampled by: JDA				**Date:** 4/24/20		
Weather during sampling: Calm, Moist, Cool				**Date Sampled:** 4/24/20		
Well Condition: Good				**Time Sampled:** 730		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 57'						
Depth to Groundwater from Measuring Point: 4.1'						
Height of Water Column: 52.9'						
Single Casing/Tubing Volume of Water: 54g						
Volume of Water to Purge Prior to Sampling: 162g						
Volume of Water Actually Purged Prior to Sampling: ~162g				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.67	7.67			
Temperature	**°F**	50.5	53.8			
Conductance	**mS/cm**	2.09	2.03			
Turbidity	**NTU/FTU**	--	--	--	--	
Color of Groundwater	Clear					
Odor	None					
Appearance	Some organics floating					
NOTES: 5" Well						

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: DH-122						
Sampled by: JDA				**Date:** 4/24/20		
Weather during sampling: Calm, Clear, Cool				**Date Sampled:** 4/24/20		
Well Condition: Good				**Time Sampled:** 800		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 45'						
Depth to Groundwater from Measuring Point: 13.2'						
Height of Water Column: 31.8'						
Single Casing/Tubing Volume of Water:						
Volume of Water to Purge Prior to Sampling:						
Volume of Water Actually Purged Prior to Sampling:				**Flow Rate:** L/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.66	7.68			
Temperature	**°F**	52.2	52.2			
Conductance	**mS/cm**	2.16	2.92			
Turbidity	**NTU/FTU**	--	--	--	--	
Color of Groundwater	Clear					
Odor	None					
Appearance	Some organics					
NOTES: 5" Well						

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: FPW						
Sampled by: JDA			**Date:** 4/24/20			
Weather during sampling: Cool, Moist, Calm			**Date Sampled:** 4/24/20			
Well Condition: Good			**Time Sampled:** 645			
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 61'						
Depth to Groundwater from Measuring Point: 11.05'						
Height of Water Column: 49.95'						
Single Casing/Tubing Volume of Water: 125g						
Volume of Water to Purge Prior to Sampling: 375g						
Volume of Water Actually Purged Prior to Sampling: ~375g			**Flow Rate:** L/min			
Method of Purging/Equipment: 12V Pump			**Voltage:**			
Method of Sampling/Equipment: 12V Pump			**Voltage:**			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	9.90	9.56			
Temperature	**°C**	50.9	55.6			
Conductance	**mS/cm**	0.82	0.97			
Turbidity	**NTU/FTU**	--	--	--	--	
Color of Groundwater	Clear					
Odor	None					
Appearance	Good					

NOTES:
8" Well
Order of sampling from SAP:
1 – FPW
2 – DH-122
3 – DH-96
4 – AMW-1
5 – SMW-2
6 – AMW-2

ATTACHMENT 1.2

SEPTEMBER 2020 FORMS

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: AMW-1						
Sampled by: MBT & SJE				**Date:** 9/22/20		
Weather during sampling: Calm, Clear, 85°F				**Date Sampled:** 9/22/20		
Well Condition: Good				**Time Sampled:** 1230		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 56.85' (Measured 9/18/2020)						
Depth to Groundwater from Measuring Point: 27.76'						
Height of Water Column: 29.09'						
Single Casing/Tubing Volume of Water: 29g						
Volume of Water to Purge Prior to Sampling: 87g						
Volume of Water Actually Purged Prior to Sampling: ~90g				**Flow Rate:**		
Method of Purging/Equipment: 12V Pump			**Voltage:**			
Method of Sampling/Equipment: 12V Pump			**Voltage:**			
FIELD PARAMETERS						
	Units	**1 (30g)**	**2 (60g)**	**3 (90g)**	**4**	**5**
pH	**pH units**	7.41	7.45	7.38		
Temperature	**°F**	59.8	59.8	59.5		
Conductance	**mS/cm**	1.78	1.90	1.98		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	Tan - Brown					
Odor	None					
Appearance	Turbid					

NOTES:
5" Well → CV = 1 g/ft

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY		**LOCATION: Keenesburg Mine, Keenesburg, Colorado**				
WELL NAME: AMW-2						
Sampled by: SJE				**Date:** 9/23/20		
Weather during sampling: Cloudy, Calm, Cool				**Date Sampled:** 9/23/20		
Well Condition: Good				**Time Sampled:** 935		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 53.60'						
Depth to Groundwater from Measuring Point: 25.59'						
Height of Water Column: 28.01'						
Single Casing/Tubing Volume of Water: 42g						
Volume of Water to Purge Prior to Sampling: 126g						
Volume of Water Actually Purged Prior to Sampling: 56g				**Flow Rate:** 2 gpm		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	6.80	6.58			
Temperature	**°F**	59.3	59.2			
Conductance	**mS/cm**	7.63	7.73			
Turbidity	**NTU/FTU**	--	--			
Color of Groundwater	Colorless					
Odor	None					
Appearance	Clear					

NOTES:
6" Well → CV = 1.5 g/ft
45' Cord

Purged on 9/22/2020 -- Field Parameters Column 1
Sample collected 9/23/2020 -- Field Parameters Column 2

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: DH-96						
Sampled by: SJE				**Date:** 9/23/20		
Weather during sampling: 84°F, breezy, clear				**Date Sampled:** 9/23/20		
Well Condition: Good				**Time Sampled:** 1240		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 53.4' (Measured 9/18/2020)						
Depth to Groundwater from Measuring Point: 3.89'						
Height of Water Column: 49.51'						
Single Casing/Tubing Volume of Water: 49.51'						
Volume of Water to Purge Prior to Sampling: 148.53g						
Volume of Water Actually Purged Prior to Sampling: ~150g				**Flow Rate:** 2 g/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 14.8 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.39				
Temperature	**°F**	58.9				
Conductance	**mS/cm**	2.08				
Turbidity	**NTU/FTU**	--	--	--	--	
Color of Groundwater	Clear					
Odor	None					
Appearance	Clear					

NOTES:
5" Well → CV = 1 g/ft
38' Cord

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: DH-122						
Sampled by: SJE				**Date:** 9/23/20		
Weather during sampling: Calm, Clear, Warm				**Date Sampled:** 9/23/20		
Well Condition: Good				**Time Sampled:** 1125		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 52.54' (Measured 9/18/2020)						
Depth to Groundwater from Measuring Point: 13.08'						
Height of Water Column: 39.46'						
Single Casing/Tubing Volume of Water: 39.46g						
Volume of Water to Purge Prior to Sampling: 118.38						
Volume of Water Actually Purged Prior to Sampling: ~119g				**Flow Rate:** 1.58 g/min		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.38				
Temperature	**°F**	59.9				
Conductance	**mS/cm**	2.63				
Turbidity	**NTU/FTU**	--	--	--	--	
Color of Groundwater	Clear					
Odor	Odorless					
Appearance	Some organics					

NOTES:
5" Well → CV = 1 g/ft
35' Cord

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: FPW						
Sampled by: MBT & SJE				**Date:** 9/22/20		
Weather during sampling: Warm, Calm				**Date Sampled:** 9/22/20		
Well Condition: Good				**Time Sampled:** 1335		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 59.3'						
Depth to Groundwater from Measuring Point: 12.29'						
Height of Water Column: 47.01'						
Single Casing/Tubing Volume of Water: 141g						
Volume of Water to Purge Prior to Sampling: 423g						
Volume of Water Actually Purged Prior to Sampling: 425g				**Flow Rate:** 1.41 gpm		
Method of Purging/Equipment: 12V Pump			**Voltage:** 12V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 12V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.56				
Temperature	**°F**	61.4				
Conductance	**mS/cm**	1.42				
Turbidity	**NTU/FTU**	--				
Color of Groundwater	Clear					
Odor	None					
Appearance	Good					

NOTES:
8" Well → CV = 3 g/ft
Checked flow rate four times over 5 hour purge period; flow rate remained constant.
Purged from 8:20 to 13:20.

Order of sampling from SAP:
1 – FPW
2 – DH-122
3 – DH-96
4 – AMW-1
5 – SMW-2
6 – AMW-2

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY		**LOCATION: Keenesburg Mine, Keenesburg, Colorado**				
WELL NAME: PC-1						
Sampled by: SJE				**Date:** 9/23/20		
Weather during sampling: Cloudy, Cool, Calm				**Date Sampled:** 9/23/20		
Well Condition: Good				**Time Sampled:** 910		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 50.15'						
Depth to Groundwater from Measuring Point: 22.97'						
Height of Water Column: 27.18'						
Single Casing/Tubing Volume of Water: 4.5g						
Volume of Water to Purge Prior to Sampling: 13.5g						
Volume of Water Actually Purged Prior to Sampling: 8g				**Flow Rate:**		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	7.14	7.09			
Temperature	**°F**	59.8	59.2			
Conductance	**mS/cm**	3.91	3.82			
Turbidity	**NTU/FTU**	--	--			
Color of Groundwater	Yellow - Brown					
Odor	None					
Appearance	Slightly Turbid					

NOTES:

45' Cord

Drew down to top of pump after 8 gallons.

AEC *AMERICAN ENVIRONMENTAL CONSULTING, LLC*

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: PC-2						
Sampled by: SJE				**Date:** 9/23/20		
Weather during sampling: Cool, Cloudy, Calm				**Date Sampled:** 9/23/20		
Well Condition: Good				**Time Sampled:** 840		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 74.78'						
Depth to Groundwater from Measuring Point: 37.78'						
Height of Water Column: 37.00'						
Single Casing/Tubing Volume of Water: 6.2g						
Volume of Water to Purge Prior to Sampling: 18.5g						
Volume of Water Actually Purged Prior to Sampling: ~8g				**Flow Rate:**		
Method of Purging/Equipment: 12V Pump			**Voltage:** 14 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 14 V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	6.86	6.78			
Temperature	**°F**	57.7	59.4			
Conductance	**mS/cm**	11.75	11.68			
Turbidity	**NTU/FTU**	--	--			
Color of Groundwater	Colorless					
Odor	None					
Appearance	Clear					

NOTES:

70' Cord

Purged dry after ~ 1 1/3 CV on 9/22/2020.
Let recover before sampling on 9/23/2020.

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: PC-5						
Sampled by: MBT & SJE				**Date:** 9/22/20		
Weather during sampling: Clear, 5mph, 80°F				**Date Sampled:** 9/22/20		
Well Condition: Good				**Time Sampled:** 1030		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 50.40'						
Depth to Groundwater from Measuring Point: 33.61'						
Height of Water Column: 16.79'						
Single Casing/Tubing Volume of Water: 2.8g						
Volume of Water to Purge Prior to Sampling: 8.4g						
Volume of Water Actually Purged Prior to Sampling: 9g				**Flow Rate:**		
Method of Purging/Equipment: 12V Pump			**Voltage:** 11 V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 11 V			
FIELD PARAMETERS						
	Units	**1 (3g)**	**2 (6g)**	**3 (9g)**	**4**	**5**
pH	**pH units**	6.53	6.54	6.58		
Temperature	**°F**	59.1	58.2	59.1		
Conductance	**mS/cm**	4.09	4.05	4.11		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	Yellow					
Odor	None					
Appearance	Slightly turbid					
NOTES:						

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: PC-6						
Sampled by: MBT & SJE				**Date:** 9/22/20		
Weather during sampling: Clear, 5mph, 80°F				**Date Sampled:** 9/22/20		
Well Condition: Good				**Time Sampled:** 1100		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well from Measuring Point: 49.00'						
Depth to Groundwater from Measuring Point: 26.78'						
Height of Water Column: 22.22'						
Single Casing/Tubing Volume of Water: 3.7g						
Volume of Water to Purge Prior to Sampling: 11.1g						
Volume of Water Actually Purged Prior to Sampling: 12g				**Flow Rate:**		
Method of Purging/Equipment: 12V Pump			**Voltage:** 9.27			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 9.27			
FIELD PARAMETERS						
	Units	**1 (4g)**	**2 (8g)**	**3 (12g)**	**4**	**5**
pH	**pH units**	7.29	7.33	7.31		
Temperature	**°F**	58.8	58.1	58.2		
Conductance	**mS/cm**	3.07	3.10	3.17		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	Clear					
Odor	None					
Appearance	Clear					
NOTES:						

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

GROUNDWATER SAMPLING FIELD DATA FORM

OWNER: COORS ENERGY			**LOCATION: Keenesburg Mine, Keenesburg, Colorado**			
WELL NAME: SMW-1						
Sampled by: MBT				**Date:** 9/22/20		
Weather during sampling:				**Date Sampled:**		
Well Condition:				**Time Sampled:**		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point:						
Depth to Groundwater from Measuring Point: 23.93'						
Height of Water Column:						
Single Casing/Tubing Volume of Water:						
Volume of Water to Purge Prior to Sampling:						
Volume of Water Actually Purged Prior to Sampling:				**Flow Rate:**		
Method of Purging/Equipment: 12V Pump			**Voltage:**			
Method of Sampling/Equipment: 12V Pump			**Voltage:**			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**					
Temperature	**°F**					
Conductance	**mS/cm**					
Turbidity	**NTU/FTU**					
Color of Groundwater						
Odor						
Appearance						
NOTES:						

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

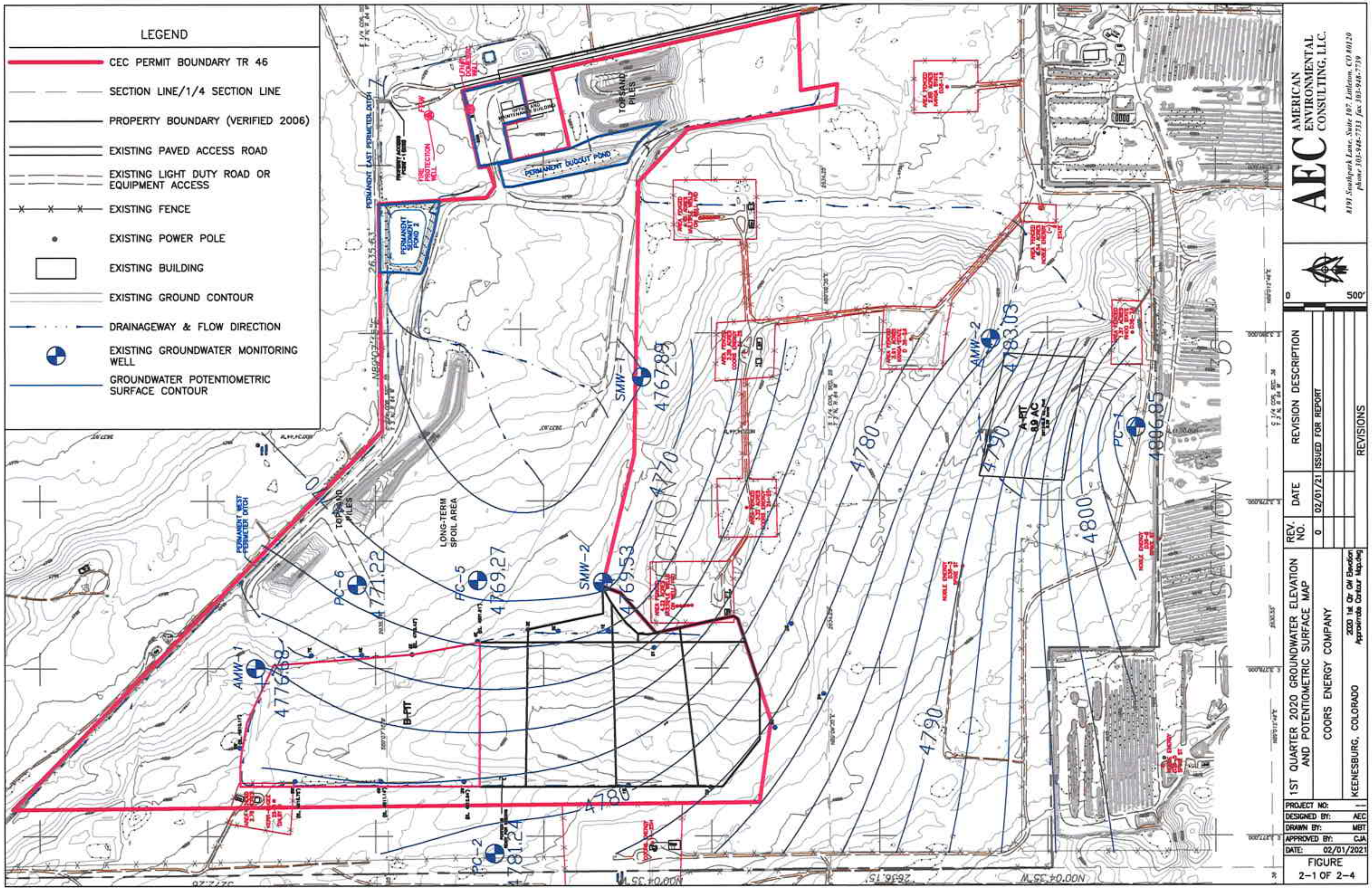
GROUNDWATER SAMPLING FIELD DATA FORM

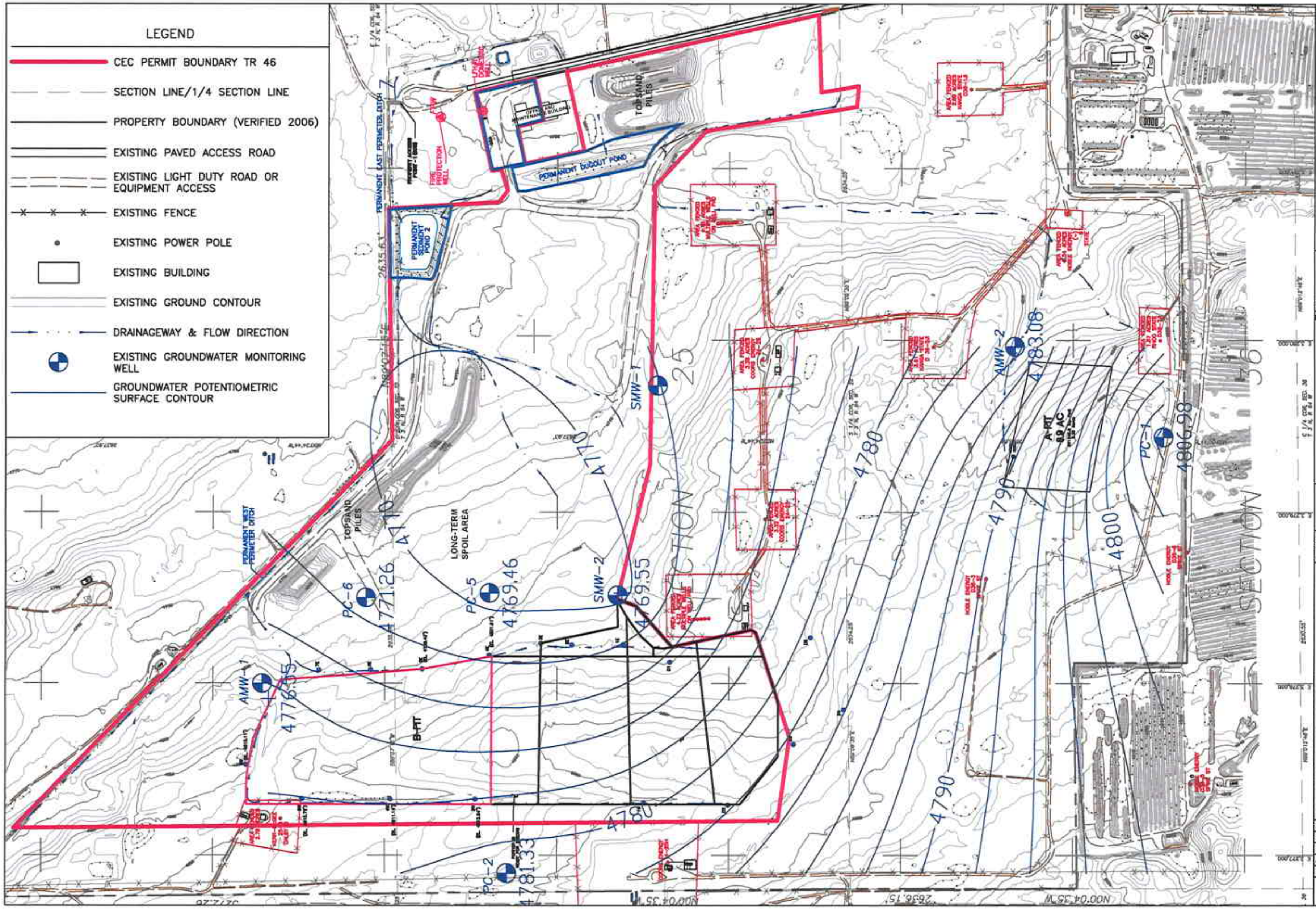
OWNER: COORS ENERGY		**LOCATION: Keenesburg Mine, Keenesburg, Colorado**				
WELL NAME: SMW-2						
Sampled by: MBT & SJE				**Date:** 9/22/20		
Weather during sampling: Clear, 5mph, 90°F				**Date Sampled:** 9/22/20		
Well Condition: Good				**Time Sampled:** 1440		
EVACUATION DATA						
Description of Measuring Point: Top of PVC						
Depth of Well From Measuring Point: 96' (Measured 9/18/2020)						
Depth to Groundwater from Measuring Point: 34.18'						
Height of Water Column: 61.82'						
Single Casing/Tubing Volume of Water: 51g						
Volume of Water to Purge Prior to Sampling: 153g						
Volume of Water Actually Purged Prior to Sampling: 160g				**Flow Rate:** 1.76 gpm		
Method of Purging/Equipment: 12V Pump			**Voltage:** 20V			
Method of Sampling/Equipment: 12V Pump			**Voltage:** 12V			
FIELD PARAMETERS						
	Units	**1**	**2**	**3**	**4**	**5**
pH	**pH units**	6.78	6.81	6.85		
Temperature	**°F**	59.8	60.4	60.4		
Conductance	**mS/cm**	8.32	8.53	8.43		
Turbidity	**NTU/FTU**	--	--	--		
Color of Groundwater	Clear					
Odor	None					
Appearance	Clear					

NOTES:
4.5" Well → Single Casing = 0.83 g/ft
Duplicate Collected

ATTACHMENT 2

QUARTERLY POTENTIOMETRIC SURFACE CONTOUR MAPS


LEGEND
CEC PERMIT BOUNDARY TR 46
SECTION LINE/1/4 SECTION LINE
PROPERTY BOUNDARY (VERIFIED 2006)
EXISTING PAVED ACCESS ROAD
EXISTING LIGHT DUTY ROAD OR EQUIPMENT ACCESS
EXISTING FENCE
EXISTING POWER POLE
EXISTING BUILDING
EXISTING GROUND CONTOUR
DRAINAGEWAY & FLOW DIRECTION
EXISTING GROUNDWATER MONITORING WELL
GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR
TOPSAND PILES
PERMANENT DUGOUT POND
PERMANENT SEDIMENT POND 2
PERMANENT EAST PERIMETER DITCH
PERMANENT WEST PERIMETER DITCH
FIRE PROTECTION WELL
LONG-TERM SPOIL AREA
A-PIT
8.9 AC
B-PIT
SMW-1
4767.89
SMW-2
4769.53
FC-5
4769.27
PC-6
4771.22
AMW-1
4776.58
AMW-2
4783.03
PC-1
4806.85
PC-2
4781.24
4770
4780
4790
4800
SECTION
2635.63'
2636.15'
N00°04'35"W
AEC
AMERICAN ENVIRONMENTAL CONSULTING, LLC.
8191 Southpark Lane, Suite 107, Littleton, CO 80120
phone 303-948-7733 fax 303-948-7739
0
500'
REV. NO. | DATE | REVISION DESCRIPTION
0 | 02/01/21 | ISSUED FOR REPORT
REVISIONS
1ST QUARTER 2020 GROUNDWATER ELEVATION AND POTENTIOMETRIC SURFACE MAP
COORS ENERGY COMPANY
KEENESBURG, COLORADO
2020 1st Qtr GW Elevation Approximate Contour Map.dwg
PROJECT NO: —
DESIGNED BY: AEC
DRAWN BY: MBT
APPROVED BY: CJA
DATE: 02/01/2021
FIGURE
2-1 OF 2-4



REV. NO.	DATE	REVISION DESCRIPTION
0	02/01/21	ISSUED FOR REPORT

REVISIONS

2ND QUARTER 2020 GROUNDWATER ELEVATION AND POTENTIOMETRIC SURFACE MAP

COORS ENERGY COMPANY

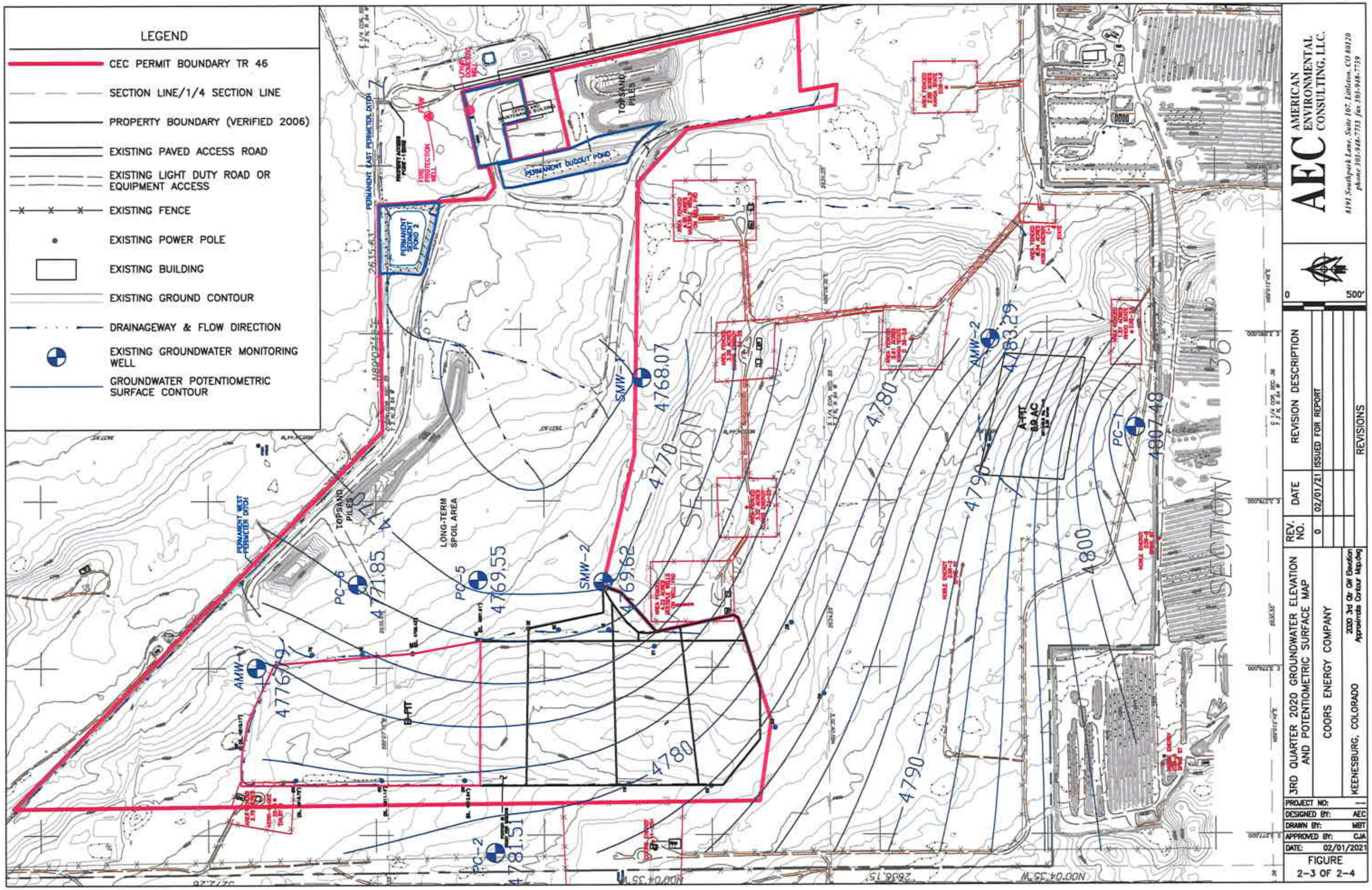
KEENESBURG, COLORADO

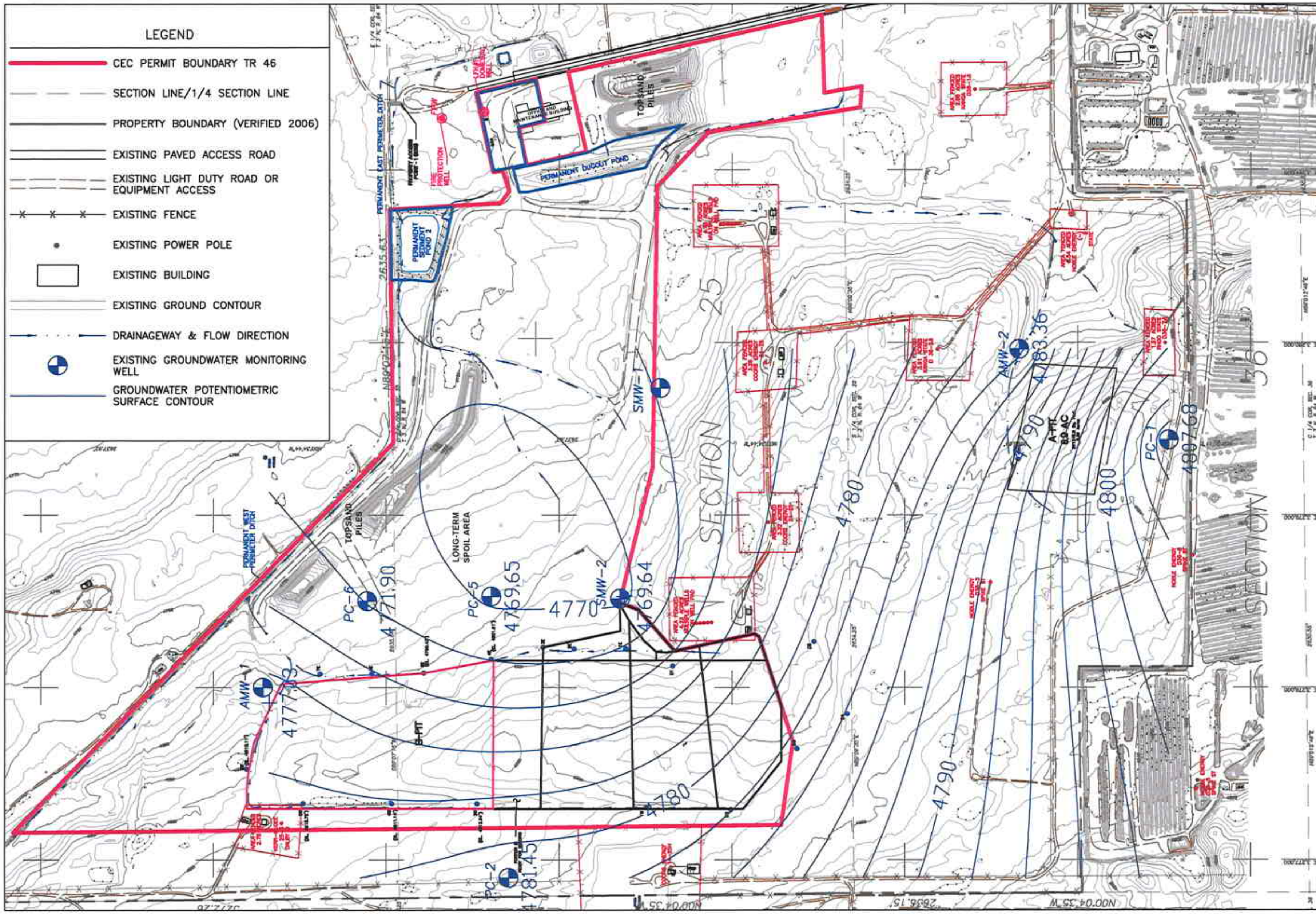
2020 2nd Qtr GW Elevation Approximate Contour Map.dwg

PROJECT NO:	--
DESIGNED BY:	AEC
DRAWN BY:	MBT
APPROVED BY:	CJA
DATE:	02/01/2021

FIGURE 2-2 OF 2-4

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.
8191 Southpark Lane, Suite 107, Littleton, CO 80120
phone 303-948-7733 fax 303-948-7739


LEGEND
CEC PERMIT BOUNDARY TR 46
SECTION LINE/1/4 SECTION LINE
PROPERTY BOUNDARY (VERIFIED 2006)
EXISTING PAVED ACCESS ROAD
EXISTING LIGHT DUTY ROAD OR EQUIPMENT ACCESS
EXISTING FENCE
EXISTING POWER POLE
EXISTING BUILDING
EXISTING GROUND CONTOUR
DRAINAGEWAY & FLOW DIRECTION
EXISTING GROUNDWATER MONITORING WELL
GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR
TOPSAND PILES
PERMANENT DUGOUT POND
PERMANENT EAST PERIMETER DITCH
PERMANENT SEDIMENT POND 2
FIRE PROTECTION WELL
LONG-TERM SPOIL AREA
PERMANENT WEST PERIMETER DITCH
SECTION 25
SECTION 36
A-PIT
8.9 AC
B-PIT
SMW-1
4768.07
SMW-2
4769.62
PC-5
4769.55
PC-6
4771.85
AMW-1
4776.79
PC-2
4781.51
AMW-2
4783.29
PC-1
4807.48
4770
4780
4790
4800
AEC
AMERICAN ENVIRONMENTAL CONSULTING, LLC
8191 Southpark Lane, Suite 107, Littleton, CO 80120
phone 303-948-7733 fax 303-948-7739
0
500'
REV. NO.
DATE
REVISION DESCRIPTION
0
02/01/21
ISSUED FOR REPORT
REVISIONS
3RD QUARTER 2020 GROUNDWATER ELEVATION AND POTENTIOMETRIC SURFACE MAP
COORS ENERGY COMPANY
KEENESBURG, COLORADO
2020 3rd Qtr GW Elevation Approximate Contour Map.dwg
PROJECT NO: —
DESIGNED BY: AEC
DRAWN BY: MBT
APPROVED BY: CJA
DATE: 02/01/2021
FIGURE
2-3 OF 2-4



AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC.
8191 Southpark Lane, Suite 107, Littleton, CO 80120
phone 303-948-7733 fax 303-948-7739

0 500'

REV. NO.	DATE	REVISION DESCRIPTION
0	02/01/21	ISSUED FOR REPORT

REVISIONS

4TH QUARTER 2020 GROUNDWATER ELEVATION AND POTENTIOMETRIC SURFACE MAP

COORS ENERGY COMPANY

KEENESBURG, COLORADO

2020 4th Qtr GW Elevation Approximate Contour Mapping

PROJECT NO:	--
DESIGNED BY:	AEC
DRAWN BY:	MBT
APPROVED BY:	CJA
DATE:	02/01/2021

FIGURE 2-4 OF 2-4

ATTACHMENT 3

LABORATORY ANALYTICAL REPORTS

ATTACHMENT 3.1

APRIL 2020 REPORT

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

May 04, 2020

American Environmental - CO

Sample Delivery Group:	L1212410
Samples Received:	04/25/2020
Project Number:	
Description:	Keenesburg Mine

Report To:

Jordan Adkins
8191 Southpark Lane
Suite 107
Littleton, CO 80120

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

TABLE OF CONTENTS

ONE LAB. NATIONWIDE.

PC-1 L1212410-01 GW

Collected by: JDA | Collected date/time: 04/23/20 11:00 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467579	1	05/01/20 09:56	05/01/20 09:56	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466401	1	04/27/20 10:58	04/27/20 13:14	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/29/20 23:59	04/29/20 23:59	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 08:22	04/29/20 08:22	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	100	04/29/20 08:35	04/29/20 08:35	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:38	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467579	1	04/30/20 17:13	05/01/20 09:56	CCE	Mt. Juliet, TN

DH-96 L1212410-02 GW

Collected by: JDA | Collected date/time: 04/24/20 07:30 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467579	1	05/01/20 09:58	05/01/20 09:58	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 00:17	04/30/20 00:17	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 08:47	04/29/20 08:47	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	10	04/29/20 09:00	04/29/20 09:00	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:41	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467579	1	04/30/20 17:13	05/01/20 09:58	CCE	Mt. Juliet, TN

PC-5 L1212410-03 GW

Collected by: JDA | Collected date/time: 04/23/20 13:30 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467579	1	05/01/20 10:02	05/01/20 10:02	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466401	1	04/27/20 10:58	04/27/20 13:14	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 00:25	04/30/20 00:25	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 09:13	04/29/20 09:13	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	20	04/29/20 16:27	04/29/20 16:27	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:44	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467579	1	04/30/20 17:13	05/01/20 10:02	CCE	Mt. Juliet, TN

PC-6 L1212410-04 GW

Collected by: JDA | Collected date/time: 04/23/20 14:30 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467579	1	05/01/20 10:10	05/01/20 10:10	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466401	1	04/27/20 10:58	04/27/20 13:14	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 00:33	04/30/20 00:33	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 09:39	04/29/20 09:39	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	50	04/29/20 10:17	04/29/20 10:17	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:47	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467579	1	04/30/20 17:13	05/01/20 10:10	CCE	Mt. Juliet, TN

FPW L1212410-05 GW

Collected by: JDA | Collected date/time: 04/24/20 06:45 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467579	1	05/01/20 10:12	05/01/20 10:12	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 00:42	04/30/20 00:42	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 10:30	04/29/20 10:30	ELN	Mt. Juliet, TN

FPW L1212410-05 GW

Collected by: JDA | Collected date/time: 04/24/20 06:45 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1466516	5	04/29/20 16:40	04/29/20 16:40	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:49	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467579	1	04/30/20 17:13	05/01/20 10:12	CCE	Mt. Juliet, TN

PC-2 L1212410-06 GW

Collected by: JDA | Collected date/time: 04/24/20 10:20 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467579	1	05/01/20 12:33	05/01/20 12:33	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 00:51	04/30/20 00:51	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 10:43	04/29/20 10:43	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	100	04/29/20 10:56	04/29/20 10:56	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:52	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	5	04/29/20 22:55	05/01/20 10:02	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467579	5	04/30/20 17:13	05/01/20 12:33	CCE	Mt. Juliet, TN

DH-122 L1212410-07 GW

Collected by: JDA | Collected date/time: 04/24/20 08:00 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467793	1	05/01/20 16:02	05/01/20 16:02	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 00:59	04/30/20 00:59	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 11:09	04/29/20 11:09	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	50	04/29/20 11:21	04/29/20 11:21	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:55	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467793	1	04/30/20 18:47	05/01/20 16:02	EL	Mt. Juliet, TN

SMW-2 L1212410-08 GW

Collected by: JDA | Collected date/time: 04/24/20 08:45 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467793	1	05/03/20 19:05	05/03/20 19:05	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 01:08	04/30/20 01:08	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 11:34	04/29/20 11:34	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	100	04/29/20 11:47	04/29/20 11:47	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 18:58	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	5	04/29/20 22:55	05/01/20 10:04	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467793	5	04/30/20 18:47	05/03/20 19:05	EL	Mt. Juliet, TN

AMW-1 L1212410-09 GW

Collected by: JDA | Collected date/time: 04/24/20 09:15 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1467793	1	05/01/20 16:08	05/01/20 16:08	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 01:16	04/30/20 01:16	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 12:00	04/29/20 12:00	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	10	04/29/20 12:13	04/29/20 12:13	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 19:01	CCE	Mt. Juliet, TN

Cp
1 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

AMW-1 L1212410-09 GW

Collected by: JDA | Collected date/time: 04/24/20 09:15 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1467793	1	04/30/20 18:47	05/01/20 16:08	EL	Mt. Juliet, TN

AMW-2 L1212410-10 GW

Collected by: JDA | Collected date/time: 04/24/20 09:40 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1469075	1	05/04/20 10:47	05/04/20 10:47	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 01:35	04/30/20 01:35	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 12:51	04/29/20 12:51	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	100	04/29/20 13:04	04/29/20 13:04	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 19:09	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	5	04/29/20 22:55	05/01/20 10:07	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1469075	5	05/01/20 11:08	05/04/20 10:47	CCE	Mt. Juliet, TN

DUP L1212410-11 GW

Collected by: JDA | Collected date/time: 04/24/20 00:00 | Received date/time: 04/25/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1469075	1	05/04/20 10:50	05/04/20 10:50	CCE	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1466403	1	04/29/20 08:43	04/29/20 10:11	MMF	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1466892	1	04/30/20 01:42	04/30/20 01:42	DGR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	1	04/29/20 13:17	04/29/20 13:17	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1466516	100	04/29/20 13:30	04/29/20 13:30	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	1	04/29/20 22:55	04/30/20 19:12	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1467568	5	04/29/20 22:55	05/01/20 10:10	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1469075	5	05/01/20 11:08	05/04/20 10:50	CCE	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.16		1	05/01/2020 09:56	WG1467579

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	1570		2.50	1	05/01/2020 09:56	WG1467579

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	2540		50.0	1	04/27/2020 13:14	WG1466401

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	286		20.0	1	04/29/2020 23:59	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/29/2020 23:59	WG1466892

Sample Narrative:

L1212410-01 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	18.7		1.00	1	04/29/2020 08:22	WG1466516
Fluoride	1.81		0.150	1	04/29/2020 08:22	WG1466516
Sulfate	1940		500	100	04/29/2020 08:35	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:38	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:38	WG1467568
Barium,Dissolved	0.0157		0.00500	1	04/30/2020 18:38	WG1467568
Boron,Dissolved	0.532		0.200	1	04/30/2020 18:38	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:38	WG1467568
Calcium	479		1.00	1	05/01/2020 09:56	WG1467579
Calcium,Dissolved	495		1.00	1	04/30/2020 18:38	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:38	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:38	WG1467568
Magnesium	90.3		1.00	1	05/01/2020 09:56	WG1467579
Magnesium,Dissolved	96.3		1.00	1	04/30/2020 18:38	WG1467568
Manganese,Dissolved	0.0157		0.0100	1	04/30/2020 18:38	WG1467568
Molybdenum,Dissolved	ND		0.00500	1	04/30/2020 18:38	WG1467568
Potassium,Dissolved	10.7		2.00	1	04/30/2020 18:38	WG1467568
Selenium,Dissolved	0.0759		0.0100	1	04/30/2020 18:38	WG1467568
Sodium	378		3.00	1	05/01/2020 09:56	WG1467579
Sodium,Dissolved	387		3.00	1	04/30/2020 18:38	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.05		1	05/01/2020 09:58	WG1467579

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	497		2.50	1	05/01/2020 09:58	WG1467579

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1390		20.0	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	293		20.0	1	04/30/2020 00:17	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 00:17	WG1466892

Sample Narrative:

L1212410-02 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	35.0		1.00	1	04/29/2020 08:47	WG1466516
Fluoride	2.66		0.150	1	04/29/2020 08:47	WG1466516
Sulfate	736		50.0	10	04/29/2020 09:00	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:41	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:41	WG1467568
Barium,Dissolved	0.00997		0.00500	1	04/30/2020 18:41	WG1467568
Boron,Dissolved	0.469		0.200	1	04/30/2020 18:41	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:41	WG1467568
Calcium	116		1.00	1	05/01/2020 09:58	WG1467579
Calcium,Dissolved	110		1.00	1	04/30/2020 18:41	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:41	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:41	WG1467568
Magnesium	50.1		1.00	1	05/01/2020 09:58	WG1467579
Magnesium,Dissolved	52.0		1.00	1	04/30/2020 18:41	WG1467568
Manganese,Dissolved	0.320		0.0100	1	04/30/2020 18:41	WG1467568
Molybdenum,Dissolved	0.00944	B	0.00500	1	04/30/2020 18:41	WG1467568
Potassium,Dissolved	3.56		2.00	1	04/30/2020 18:41	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 18:41	WG1467568
Sodium	259		3.00	1	05/01/2020 09:58	WG1467579
Sodium,Dissolved	266		3.00	1	04/30/2020 18:41	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.38		1	05/01/2020 10:02	WG1467579

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	2050		2.50	1	05/01/2020 10:02	WG1467579

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	3090		50.0	1	04/27/2020 13:14	WG1466401

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	575		20.0	1	04/30/2020 00:25	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 00:25	WG1466892

Sample Narrative:

L1212410-03 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	139		20.0	20	04/29/2020 16:27	WG1466516
Fluoride	ND		0.150	1	04/29/2020 09:13	WG1466516
Sulfate	1960		100	20	04/29/2020 16:27	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:44	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:44	WG1467568
Barium,Dissolved	0.0419		0.00500	1	04/30/2020 18:44	WG1467568
Boron,Dissolved	ND		0.200	1	04/30/2020 18:44	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:44	WG1467568
Calcium	570		1.00	1	05/01/2020 10:02	WG1467579
Calcium,Dissolved	591		1.00	1	04/30/2020 18:44	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:44	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:44	WG1467568
Magnesium	152		1.00	1	05/01/2020 10:02	WG1467579
Magnesium,Dissolved	159		1.00	1	04/30/2020 18:44	WG1467568
Manganese,Dissolved	18.1		0.0100	1	04/30/2020 18:44	WG1467568
Molybdenum,Dissolved	ND		0.00500	1	04/30/2020 18:44	WG1467568
Potassium,Dissolved	18.7		2.00	1	04/30/2020 18:44	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 18:44	WG1467568
Sodium	247		3.00	1	05/01/2020 10:02	WG1467579
Sodium,Dissolved	254		3.00	1	04/30/2020 18:44	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	6.85		1	05/01/2020 10:10	WG1467579

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	769		2.50	1	05/01/2020 10:10	WG1467579

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1960		50.0	1	04/27/2020 13:14	WG1466401

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	330		20.0	1	04/30/2020 00:33	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 00:33	WG1466892

Sample Narrative:

L1212410-04 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	57.5		1.00	1	04/29/2020 09:39	WG1466516
Fluoride	3.01		0.150	1	04/29/2020 09:39	WG1466516
Sulfate	1190		250	50	04/29/2020 10:17	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:47	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:47	WG1467568
Barium,Dissolved	0.0121		0.00500	1	04/30/2020 18:47	WG1467568
Boron,Dissolved	0.566		0.200	1	04/30/2020 18:47	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:47	WG1467568
Calcium	175		1.00	1	05/01/2020 10:10	WG1467579
Calcium,Dissolved	176		1.00	1	04/30/2020 18:47	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:47	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:47	WG1467568
Magnesium	80.4		1.00	1	05/01/2020 10:10	WG1467579
Magnesium,Dissolved	84.1		1.00	1	04/30/2020 18:47	WG1467568
Manganese,Dissolved	0.0146		0.0100	1	04/30/2020 18:47	WG1467568
Molybdenum,Dissolved	0.00655	B	0.00500	1	04/30/2020 18:47	WG1467568
Potassium,Dissolved	7.19		2.00	1	04/30/2020 18:47	WG1467568
Selenium,Dissolved	0.0717		0.0100	1	04/30/2020 18:47	WG1467568
Sodium	437		3.00	1	05/01/2020 10:10	WG1467579
Sodium,Dissolved	442		3.00	1	04/30/2020 18:47	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.29		1	05/01/2020 10:12	WG1467579

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	216		2.50	1	05/01/2020 10:12	WG1467579

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	526		10.0	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	99.9		20.0	1	04/30/2020 00:42	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 00:42	WG1466892

Sample Narrative:
L1212410-05 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	29.4		1.00	1	04/29/2020 10:30	WG1466516
Fluoride	0.879		0.150	1	04/29/2020 10:30	WG1466516
Sulfate	192		25.0	5	04/29/2020 16:40	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:49	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:49	WG1467568
Barium,Dissolved	0.0231		0.00500	1	04/30/2020 18:49	WG1467568
Boron,Dissolved	ND		0.200	1	04/30/2020 18:49	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:49	WG1467568
Calcium	41.9		1.00	1	05/01/2020 10:12	WG1467579
Calcium,Dissolved	42.5		1.00	1	04/30/2020 18:49	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:49	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:49	WG1467568
Magnesium	27.1		1.00	1	05/01/2020 10:12	WG1467579
Magnesium,Dissolved	29.0		1.00	1	04/30/2020 18:49	WG1467568
Manganese,Dissolved	ND		0.0100	1	04/30/2020 18:49	WG1467568
Molybdenum,Dissolved	ND		0.00500	1	04/30/2020 18:49	WG1467568
Potassium,Dissolved	2.55		2.00	1	04/30/2020 18:49	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 18:49	WG1467568
Sodium	77.4		3.00	1	05/01/2020 10:12	WG1467579
Sodium,Dissolved	83.3		3.00	1	04/30/2020 18:49	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	22.3		1	05/01/2020 12:33	WG1467579

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	2570		12.5	1	05/01/2020 12:33	WG1467579

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	10800		200	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	916		20.0	1	04/30/2020 00:51	WG1466892
Alkalinity,Bicarbonate	916		20.0	1	04/30/2020 00:51	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 00:51	WG1466892
Alkalinity,Hydroxide	ND		20.0	1	04/30/2020 00:51	WG1466892

Sample Narrative:

L1212410-06 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	873		100	100	04/29/2020 10:56	WG1466516
Fluoride	0.393		0.150	1	04/29/2020 10:43	WG1466516
Sulfate	5700		500	100	04/29/2020 10:56	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:52	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:52	WG1467568
Barium,Dissolved	0.0162		0.00500	1	04/30/2020 18:52	WG1467568
Boron,Dissolved	0.291		0.200	1	04/30/2020 18:52	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:52	WG1467568
Calcium	453		5.00	5	05/01/2020 12:33	WG1467579
Calcium,Dissolved	451		1.00	1	04/30/2020 18:52	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:52	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:52	WG1467568
Magnesium	349		5.00	5	05/01/2020 12:33	WG1467579
Magnesium,Dissolved	348		1.00	1	04/30/2020 18:52	WG1467568
Manganese,Dissolved	2.33		0.0100	1	04/30/2020 18:52	WG1467568
Molybdenum,Dissolved	0.00512	B	0.00500	1	04/30/2020 18:52	WG1467568
Potassium,Dissolved	21.4		2.00	1	04/30/2020 18:52	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 18:52	WG1467568
Sodium	2600		15.0	5	05/01/2020 12:33	WG1467579
Sodium,Dissolved	2590		15.0	5	05/01/2020 10:02	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.08		1	05/01/2020 16:02	WG1467793

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	812		2.50	1	05/01/2020 16:02	WG1467793

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	2070		50.0	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	311		20.0	1	04/30/2020 00:59	WG1466892
Alkalinity,Bicarbonate	310		20.0	1	04/30/2020 00:59	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 00:59	WG1466892
Alkalinity,Hydroxide	ND		20.0	1	04/30/2020 00:59	WG1466892

Sample Narrative:

L1212410-07 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	137		50.0	50	04/29/2020 11:21	WG1466516
Fluoride	1.33		0.150	1	04/29/2020 11:09	WG1466516
Sulfate	908		250	50	04/29/2020 11:21	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:55	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:55	WG1467568
Barium,Dissolved	0.0233		0.00500	1	04/30/2020 18:55	WG1467568
Boron,Dissolved	0.204		0.200	1	04/30/2020 18:55	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:55	WG1467568
Calcium	210		1.00	1	05/01/2020 16:02	WG1467793
Calcium,Dissolved	213		1.00	1	04/30/2020 18:55	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:55	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:55	WG1467568
Magnesium	70.0		1.00	1	05/01/2020 16:02	WG1467793
Magnesium,Dissolved	74.5		1.00	1	04/30/2020 18:55	WG1467568
Manganese,Dissolved	0.337		0.0100	1	04/30/2020 18:55	WG1467568
Molybdenum,Dissolved	0.00880	B	0.00500	1	04/30/2020 18:55	WG1467568
Potassium,Dissolved	3.31		2.00	1	04/30/2020 18:55	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 18:55	WG1467568
Sodium	332		3.00	1	05/01/2020 16:02	WG1467793
Sodium,Dissolved	341		3.00	1	04/30/2020 18:55	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	16.1		1	05/03/2020 19:05	WG1467793

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	2050		12.5	1	05/03/2020 19:05	WG1467793

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	7070		100	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	1030		20.0	1	04/30/2020 01:08	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 01:08	WG1466892

Sample Narrative:
L1212410-08 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	728		100	100	04/29/2020 11:47	WG1466516
Fluoride	0.443		0.150	1	04/29/2020 11:34	WG1466516
Sulfate	3150		500	100	04/29/2020 11:47	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 18:58	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 18:58	WG1467568
Barium,Dissolved	0.0154		0.00500	1	04/30/2020 18:58	WG1467568
Boron,Dissolved	0.339		0.200	1	04/30/2020 18:58	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 18:58	WG1467568
Calcium	512		5.00	5	05/03/2020 19:05	WG1467793
Calcium,Dissolved	472		1.00	1	04/30/2020 18:58	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 18:58	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 18:58	WG1467568
Magnesium	187		5.00	5	05/03/2020 19:05	WG1467793
Magnesium,Dissolved	177		1.00	1	04/30/2020 18:58	WG1467568
Manganese,Dissolved	0.493		0.0100	1	04/30/2020 18:58	WG1467568
Molybdenum,Dissolved	ND		0.00500	1	04/30/2020 18:58	WG1467568
Potassium,Dissolved	16.1		2.00	1	04/30/2020 18:58	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 18:58	WG1467568
Sodium	1670		15.0	5	05/03/2020 19:05	WG1467793
Sodium,Dissolved	1640		15.0	5	05/01/2020 10:04	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.76		1	05/01/2020 16:08	WG1467793

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	784		2.50	1	05/01/2020 16:08	WG1467793

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1630		20.0	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	217		20.0	1	04/30/2020 01:16	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 01:16	WG1466892

Sample Narrative:

L1212410-09 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	27.1		1.00	1	04/29/2020 12:00	WG1466516
Fluoride	1.34		0.150	1	04/29/2020 12:00	WG1466516
Sulfate	710		50.0	10	04/29/2020 12:13	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 19:01	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 19:01	WG1467568
Barium,Dissolved	0.0312		0.00500	1	04/30/2020 19:01	WG1467568
Boron,Dissolved	ND		0.200	1	04/30/2020 19:01	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 19:01	WG1467568
Calcium	217		1.00	1	05/01/2020 16:08	WG1467793
Calcium,Dissolved	206		1.00	1	04/30/2020 19:01	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 19:01	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 19:01	WG1467568
Magnesium	58.6		1.00	1	05/01/2020 16:08	WG1467793
Magnesium,Dissolved	61.1		1.00	1	04/30/2020 19:01	WG1467568
Manganese,Dissolved	ND		0.0100	1	04/30/2020 19:01	WG1467568
Molybdenum,Dissolved	0.00554	B	0.00500	1	04/30/2020 19:01	WG1467568
Potassium,Dissolved	3.22		2.00	1	04/30/2020 19:01	WG1467568
Selenium,Dissolved	0.0210		0.0100	1	04/30/2020 19:01	WG1467568
Sodium	113		3.00	1	05/01/2020 16:08	WG1467793
Sodium,Dissolved	122		3.00	1	04/30/2020 19:01	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	15.1		1	05/04/2020 10:47	WG1469075

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	2010		12.5	1	05/04/2020 10:47	WG1469075

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	6770		100	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	762		20.0	1	04/30/2020 01:35	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 01:35	WG1466892

Sample Narrative:

L1212410-10 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	328		100	100	04/29/2020 13:04	WG1466516
Fluoride	0.293		0.150	1	04/29/2020 12:51	WG1466516
Sulfate	3490		500	100	04/29/2020 13:04	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 19:09	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 19:09	WG1467568
Barium,Dissolved	0.0200		0.00500	1	04/30/2020 19:09	WG1467568
Boron,Dissolved	0.241		0.200	1	04/30/2020 19:09	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 19:09	WG1467568
Calcium	495		5.00	5	05/04/2020 10:47	WG1469075
Calcium,Dissolved	463		1.00	1	04/30/2020 19:09	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 19:09	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 19:09	WG1467568
Magnesium	187		5.00	5	05/04/2020 10:47	WG1469075
Magnesium,Dissolved	176		1.00	1	04/30/2020 19:09	WG1467568
Manganese,Dissolved	3.38		0.0100	1	04/30/2020 19:09	WG1467568
Molybdenum,Dissolved	ND		0.00500	1	04/30/2020 19:09	WG1467568
Potassium,Dissolved	27.9		2.00	1	04/30/2020 19:09	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 19:09	WG1467568
Sodium	1550		15.0	5	05/04/2020 10:47	WG1469075
Sodium,Dissolved	1490		15.0	5	05/01/2020 10:07	WG1467568

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	14.9		1	05/04/2020 10:50	WG1469075

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	1960		12.5	1	05/04/2020 10:50	WG1469075

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	6830		100	1	04/29/2020 10:11	WG1466403

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	752		20.0	1	04/30/2020 01:42	WG1466892
Alkalinity,Carbonate	ND		20.0	1	04/30/2020 01:42	WG1466892

Sample Narrative:

L1212410-11 WG1466892: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	323		100	100	04/29/2020 13:30	WG1466516
Fluoride	0.207		0.150	1	04/29/2020 13:17	WG1466516
Sulfate	3420		500	100	04/29/2020 13:30	WG1466516

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	04/30/2020 19:12	WG1467568
Arsenic,Dissolved	ND		0.0100	1	04/30/2020 19:12	WG1467568
Barium,Dissolved	0.0199		0.00500	1	04/30/2020 19:12	WG1467568
Boron,Dissolved	0.243		0.200	1	04/30/2020 19:12	WG1467568
Cadmium,Dissolved	ND		0.00200	1	04/30/2020 19:12	WG1467568
Calcium	486		5.00	5	05/04/2020 10:50	WG1469075
Calcium,Dissolved	462		1.00	1	04/30/2020 19:12	WG1467568
Iron,Dissolved	ND		0.100	1	04/30/2020 19:12	WG1467568
Lead,Dissolved	ND		0.00600	1	04/30/2020 19:12	WG1467568
Magnesium	182		5.00	5	05/04/2020 10:50	WG1469075
Magnesium,Dissolved	175		1.00	1	04/30/2020 19:12	WG1467568
Manganese,Dissolved	3.37		0.0100	1	04/30/2020 19:12	WG1467568
Molybdenum,Dissolved	ND		0.00500	1	04/30/2020 19:12	WG1467568
Potassium,Dissolved	28.0		2.00	1	04/30/2020 19:12	WG1467568
Selenium,Dissolved	ND		0.0100	1	04/30/2020 19:12	WG1467568
Sodium	1520		15.0	5	05/04/2020 10:50	WG1469075
Sodium,Dissolved	1480		15.0	5	05/01/2020 10:10	WG1467568

Method Blank (MB)

(MB) R3522727-1 04/27/20 13:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1212481-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1212481-03 04/27/20 13:14 • (DUP) R3522727-3 04/27/20 13:14

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	2260	2570	1	12.6	J3	5

Laboratory Control Sample (LCS)

(LCS) R3522727-2 04/27/20 13:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8400	95.5	85.0-115	

Method Blank (MB)

(MB) R3523633-1 04/29/20 10:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1212410-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1212410-11 04/29/20 10:11 • (DUP) R3523633-3 04/29/20 10:11

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	6830	6870	1	0.584		5

Laboratory Control Sample (LCS)

(LCS) R3523633-2 04/29/20 10:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8750	99.4	85.0-115	

Method Blank (MB)

(MB) R3523320-1 04/29/20 22:24

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	U		8.45	20.0
Alkalinity,Bicarbonate	U		8.45	20.0
Alkalinity,Carbonate	U		8.45	20.0
Alkalinity,Hydroxide	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1212410-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1212410-01 04/29/20 23:59 • (DUP) R3523320-3 04/30/20 00:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	286	287	1	0.291		20
Alkalinity,Bicarbonate	286	287	1	0.291		20
Alkalinity,Carbonate	ND	0.000	1	0.000		20
Alkalinity,Hydroxide	ND	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

L1212410-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1212410-11 04/30/20 01:42 • (DUP) R3523320-4 04/30/20 02:13

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	752	774	1	2.98		20
Alkalinity,Bicarbonate	752	774	1	2.98		20
Alkalinity,Carbonate	ND	0.000	1	0.000		20
Alkalinity,Hydroxide	ND	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3523320-2 04/29/20 23:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	105	105	85.0-115	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3523210-1 04/29/20 04:10

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1212557-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1212557-01 04/29/20 14:22 • (DUP) R3523210-6 04/29/20 14:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	2.33	2.19	1	6.21		15
Fluoride	ND	0.0749	1	0.000		15
Sulfate	5.29	5.18	1	2.02		15

L1212306-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1212306-01 04/29/20 15:26 • (DUP) R3523210-8 04/29/20 15:56

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	17.4	17.1	1	1.77		15
Fluoride	3.62	3.62	1	0.0110		15
Sulfate	56.0	55.3	1	1.27		15

Laboratory Control Sample (LCS)

(LCS) R3523210-2 04/29/20 04:23

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.8	99.6	80.0-120	
Fluoride	8.00	8.17	102	80.0-120	
Sulfate	40.0	40.6	101	80.0-120	

L1212330-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1212330-02 04/29/20 06:26 • (MS) R3523210-4 04/29/20 06:39 • (MSD) R3523210-5 04/29/20 06:52

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	1950	1900	1900	0.000	0.000	1	80.0-120	E V	E V	0.0859	15
Fluoride	5.00	0.307	5.55	5.47	105	103	1	80.0-120			1.45	15
Sulfate	50.0	14.9	65.8	65.3	102	101	1	80.0-120			0.834	15

L1212557-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1212557-01 04/29/20 14:22 • (MS) R3523210-7 04/29/20 14:48

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	2.33	54.2	104	1	80.0-120	
Fluoride	5.00	ND	5.46	108	1	80.0-120	
Sulfate	50.0	5.29	57.4	104	1	80.0-120	

Method Blank (MB)

(MB) R3523733-1 04/30/20 18:03

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.00430	0.0100
Arsenic,Dissolved	U		0.00440	0.0100
Barium,Dissolved	U		0.000895	0.00500
Boron,Dissolved	U		0.0254	0.200
Cadmium,Dissolved	U		0.000563	0.00200
Calcium,Dissolved	U		0.389	1.00
Iron,Dissolved	U		0.0458	0.100
Lead,Dissolved	U		0.00295	0.00600
Magnesium,Dissolved	U		0.111	1.00
Manganese,Dissolved	U		0.00327	0.0100
Molybdenum,Dissolved	0.00140	J	0.00104	0.00500
Potassium,Dissolved	U		0.510	2.00
Selenium,Dissolved	U		0.00735	0.0100
Sodium,Dissolved	U		1.40	3.00

Laboratory Control Sample (LCS)

(LCS) R3523733-2 04/30/20 18:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony,Dissolved	1.00	0.952	95.2	80.0-120	
Arsenic,Dissolved	1.00	0.931	93.1	80.0-120	
Barium,Dissolved	1.00	0.985	98.5	80.0-120	
Boron,Dissolved	1.00	0.978	97.8	80.0-120	
Cadmium,Dissolved	1.00	0.947	94.7	80.0-120	
Calcium,Dissolved	10.0	9.80	98.0	80.0-120	
Iron,Dissolved	10.0	9.75	97.5	80.0-120	
Lead,Dissolved	1.00	0.957	95.7	80.0-120	
Magnesium,Dissolved	10.0	10.0	100	80.0-120	
Manganese,Dissolved	1.00	0.941	94.1	80.0-120	
Molybdenum,Dissolved	1.00	0.978	97.8	80.0-120	
Potassium,Dissolved	10.0	9.34	93.4	80.0-120	
Selenium,Dissolved	1.00	0.942	94.2	80.0-120	
Sodium,Dissolved	10.0	10.1	101	80.0-120	

L1211914-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1211914-02 04/30/20 18:08 • (MS) R3523733-4 04/30/20 18:14 • (MSD) R3523733-5 04/30/20 18:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic,Dissolved	1.00	U	0.937	0.948	93.7	94.8	1	75.0-125			1.13	20
Barium,Dissolved	1.00	0.00642	0.993	0.995	98.7	98.9	1	75.0-125			0.240	20
Boron,Dissolved	1.00	0.118	1.06	1.09	94.6	96.9	1	75.0-125			2.14	20
Cadmium,Dissolved	1.00	U	0.956	0.960	95.6	96.0	1	75.0-125			0.432	20
Iron,Dissolved	10.0	0.188	9.89	9.89	97.1	97.0	1	75.0-125			0.0805	20
Lead,Dissolved	1.00	U	0.966	0.973	96.6	97.3	1	75.0-125			0.750	20
Magnesium,Dissolved	10.0	2.42	12.3	12.2	98.4	98.1	1	75.0-125			0.193	20
Manganese,Dissolved	1.00	0.0190	0.957	0.966	93.8	94.7	1	75.0-125			0.983	20
Potassium,Dissolved	10.0	1.51	10.8	10.8	92.8	93.3	1	75.0-125			0.419	20
Selenium,Dissolved	1.00	U	0.950	0.965	95.0	96.5	1	75.0-125			1.52	20

Method Blank (MB)

(MB) R3523895-1 05/01/20 09:03

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium	U		0.389	1.00
Magnesium	U		0.111	1.00
Sodium	U		1.40	3.00

Laboratory Control Sample (LCS)

(LCS) R3523895-2 05/01/20 09:05

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Calcium	10.0	9.69	96.9	80.0-120	
Magnesium	10.0	9.55	95.5	80.0-120	
Sodium	10.0	9.65	96.5	80.0-120	

L1212334-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1212334-01 05/01/20 09:08 • (MS) R3523895-4 05/01/20 09:13 • (MSD) R3523895-5 05/01/20 09:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium	10.0	11.0	20.6	20.6	95.9	96.6	1	75.0-125			0.348	20
Magnesium	10.0	6.41	15.8	15.9	94.1	94.7	1	75.0-125			0.438	20
Sodium	10.0	16.0	24.9	25.1	89.7	91.9	1	75.0-125			0.898	20

Method Blank (MB)

(MB) R3524128-1 05/01/20 15:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium	U		0.389	1.00
Magnesium	U		0.111	1.00
Sodium	U		1.40	3.00

Laboratory Control Sample (LCS)

(LCS) R3524128-2 05/01/20 15:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Calcium	10.0	9.34	93.4	80.0-120	
Magnesium	10.0	9.41	94.1	80.0-120	
Sodium	10.0	9.55	95.5	80.0-120	

L1212923-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1212923-08 05/01/20 15:52 • (MS) R3524128-4 05/01/20 15:57 • (MSD) R3524128-5 05/01/20 15:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium	10.0	82.0	89.2	88.1	71.7	61.4	1	75.0-125	V	V	1.16	20
Magnesium	10.0	33.7	42.0	41.4	82.7	77.2	1	75.0-125			1.34	20
Sodium	10.0	20.8	29.2	29.0	84.0	82.2	1	75.0-125			0.608	20

Method Blank (MB)

(MB) R3524340-1 05/03/20 17:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium	U		0.389	1.00
Magnesium	U		0.111	1.00
Sodium	U		1.40	3.00

Laboratory Control Sample (LCS)

(LCS) R3524340-2 05/03/20 17:35

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Calcium	10.0	9.89	98.9	80.0-120	
Magnesium	10.0	9.90	99.0	80.0-120	
Sodium	10.0	10.4	104	80.0-120	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed: Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

American Environmental - CO

8191 Southpark Lane
Suite 107
Littleton, CO 80120

Report to: Jordan Adkins

Project Description: Keenesburg Mine

Phone: 303-948-7733

Collected by (print): JDA

Collected by (signature): [signature]

Immediately Packed on Ice N___ Y X

Billing Information: Accounts Payable, 8191 Southpark Lane, Suite 107, Littleton, CO 80120

Email To: jadkins@aecdenver.com;cahrendsen@aecdenve

City/State Collected: Keenesburg, CO

Please Circle: PT MT CT ET

Client Project #:

Lab Project #: AMEENVLCO-KEENESBURG

Site/Facility ID #:

P.O. #:

Rush? (Lab MUST Be Notified): ___ Same Day ___ Five Day ___ Next Day ___ 5 Day (Rad Only) ___ Two Day ___ 10 Day (Rad Only) ___ Three Day

Quote #:

Date Results Needed:

Chain of Custody Page 1 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd, Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1212410

A086

Acctnum: AMEENVLCO
Template: T160430
Prelogin: P767894
PM: 824 - Chris Ward
PB:
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALKBI,ALKCA 250mlHDPE-NoPres	Cl,F,SO4 125mlHDPE-NoPres	Diss Metals 250mlHDPE-NoPres	HARD 250mlHDPE-HNO3	SAR 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres	V8260 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
PC-1		GW	23.48'	4/23/20	11:00	6	X	X	X	X	X	X			01
~~[struck]~~ DH-96		GW	4.10'	4/24/20	730	6	X	X	X	X	X	X			02
PC-5		GW	33.20'	4/23/20	1330	6	X	X	X	X	X	X			03
PC-6		GW	27.37'	4/23/20	1430	6	X	X	X	X	X	X			04
~~AMW-1~~		~~GW~~				~~6~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~[struck]~~		~~GW~~				~~6~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~[struck]~~		~~GW~~				~~6~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
~~[struck]~~		~~GW~~				~~6~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
FPW		GW	11.05'	4/24/20	645	6	X	X	X	X	X	X			05
~~Trip Blank~~		~~GW~~				~~X~~							~~X~~	NA	

* Matrix: SS - Soil, AIR - Air, F - Filter, GW - Groundwater, B - Bioassay, WW - WasteWater, DW - Drinking Water, OT - Other

Remarks: Diss Metals=As,Ba,B,Ca,Cd,Fe,Kd,Mg,Mn,Na,Pb,Sb,Se
PC-1,PC-2PC-6,AMW-1,AMW-2,SMW-2: Fluoride, SBDICP, BDICP, KDICP
AMW-1,AMW-2,SMW-2,FPW,DH-96,DH-122: ALKOH, ALK
Red Cooler

pH ___ Temp ___
Flow ___ Other ___

Samples returned via: ___ UPS ___ FedEx ___ Courier ___

Tracking # 1145 2233 0097

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
[signature]	4/24/20	1645		2
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.4-1=1.3 AGC; Bottles Received: 48
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) Sandy Yossef	Date: 4/25/20 Time: 9:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Chain of Custody Page 2 of 2

American Environmental - CO

8191 Southpark Lane
Suite 107
Littleton, CO 80120

Report to: Jordan Adkins

Billing Information:
Accounts Payable
8191 Southpark Lane
Suite 107
Littleton, CO 80120

Email To: jadkins@aecdenver.com;cahrendsen@aecdenve

Pace Analytical® National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Project Description: Keenesburg Mine
City/State Collected:
Please Circle: PT MT CT ET

Phone: 303-948-7733
Client Project #
Lab Project # AMEENVLCO-KEENESBURG

Collected by (print):
Site/Facility ID #
P.O. #

Collected by (signature):
Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Quote #
Date Results Needed

Immediately Packed on Ice N ___ Y ___

SDG #
Table #
Acctnum: AMEENVLCO
Template: T160430
Prelogin: P767894
PM: 824 - Chris Ward
PB:
Shipped Via: FedEX Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALKBI,ALKCA 250mlHDPE-NoPres	Cl,F,SO4 125mlHDPE-NoPres	Diss Metals 250mlHDPE-NoPres	HARD 250mlHDPE-HNO3	SAR 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres	V8260 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
~~DH-96~~ PC-2		GW	37.96'	4/24/20	1030	6	X	X	X	X	X	X			06
DH-122		GW	13.20'	4/24/20	800	6	X	X	X	X	X	X			07
SMW-2		GW	34.25'	4/24/20	845	6	X	X	X	X	X	X			08
AMW-1		GW	28.00'	4/24/20	9:15	6	X	X	X	X	X	X			09
AMW-2		GW	25.80'	4/24/20	9:40	6	X	X	X	X	X	X			10
Dup		GW	NA	11	NA	6	X	X	X	X	X	X			11
~~Trip blank~~														~~Seenot~~	

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ______

Remarks: Diss Metals=As,Ba,B,Ca,Cd,Fe,Kd,Mg,Mn,Na,Pb,Sb,Se
PC-1,PC-2,PC-6,AMW-1,AMW-2,SMW-2: Fluoride, SBDICP, BDICP, KDICP
AMW-1,AMW-2,SMW-2,PPW,DH-96,DH-122 ALKOH, ALK
F=DUP
Blue cooler

pH ______ Temp ______
Flow ______ Other ______

Samples returned via: ___ UPS ___ FedEx ___ Courier ______

Tracking # 1145 2233 0097

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)		
[signature]	4/24/20	16:45		Trip Blank Received: Yes / No (circled Yes); HCl / MeoH (circled HCl); TBR; 2	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: AG °C 3-1=2	Bottles Received: 48
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) Sandy Yossef	Date: 4/25/20	Time: 9:00

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

ATTACHMENT 3.2

SEPTEMBER 2020 REPORT

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

October 02, 2020

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

American Environmental - CO

Sample Delivery Group:	L1265820
Samples Received:	09/24/2020
Project Number:	
Description:	Keenesburg Mine

Report To:

Jordan Adkins
8191 Southpark Lane
Suite 107
Littleton, CO 80120

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

TABLE OF CONTENTS

ONE LAB. NATIONWIDE.

PC-1 L1265820-01 GW

Collected by: SJE | Collected date/time: 09/23/20 09:10 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	09/29/20 23:56	09/29/20 23:56	JDG	Mt. Juliet, TN
Calculated Results	WG1550839	1	09/29/20 23:56	09/29/20 23:56	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551992	1	09/30/20 19:18	09/30/20 19:58	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 19:34	09/26/20 19:34	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 02:26	09/29/20 02:26	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	100	09/29/20 02:45	09/29/20 02:45	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 00:57	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	1	09/29/20 17:48	09/29/20 23:56	JDG	Mt. Juliet, TN

PC-2 L1265820-02 GW

Collected by: SJE | Collected date/time: 09/23/20 08:40 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	10/02/20 12:38	10/02/20 12:38	TRB	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551992	1	09/30/20 19:18	09/30/20 19:58	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 19:42	09/26/20 19:42	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 03:03	09/29/20 03:03	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	100	09/29/20 03:22	09/29/20 03:22	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:00	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	5	09/30/20 14:38	10/01/20 09:02	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	5	09/29/20 17:48	10/02/20 12:38	TRB	Mt. Juliet, TN

PC-5 L1265820-03 GW

Collected by: SJE | Collected date/time: 09/22/20 10:30 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	09/30/20 00:03	09/30/20 00:03	JDG	Mt. Juliet, TN
Calculated Results	WG1550839	1	09/30/20 00:03	09/30/20 00:03	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551103	1	09/29/20 18:59	09/29/20 19:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 19:49	09/26/20 19:49	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 03:40	09/29/20 03:40	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	50	09/29/20 03:59	09/29/20 03:59	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:03	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	1	09/29/20 17:48	09/30/20 00:03	JDG	Mt. Juliet, TN

PC-6 L1265820-04 GW

Collected by: SJE | Collected date/time: 09/22/20 11:00 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	09/30/20 00:06	09/30/20 00:06	JDG	Mt. Juliet, TN
Calculated Results	WG1550839	1	09/30/20 00:06	09/30/20 00:06	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551103	1	09/29/20 18:59	09/29/20 19:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 19:56	09/26/20 19:56	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 04:54	09/29/20 04:54	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	100	09/29/20 05:12	09/29/20 05:12	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:06	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	1	09/29/20 17:48	09/30/20 00:06	JDG	Mt. Juliet, TN

Cp 1 Tc 3 Ss 4 Cn 5 Sr 6 Qc 7 Gl 8 Al 9 Sc

AMW-1 L1265820-05 GW

Collected by: SJE | Collected date/time: 09/22/20 12:30 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	09/30/20 00:09	09/30/20 00:09	JDG	Mt. Juliet, TN
Calculated Results	WG1550839	1	09/30/20 00:09	09/30/20 00:09	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551103	1	09/29/20 18:59	09/29/20 19:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 20:03	09/26/20 20:03	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 05:31	09/29/20 05:31	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	10	09/29/20 05:49	09/29/20 05:49	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:09	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	1	09/29/20 17:48	09/30/20 00:09	JDG	Mt. Juliet, TN

AMW-2 L1265820-06 GW

Collected by: SJE | Collected date/time: 09/23/20 09:35 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	10/02/20 12:41	10/02/20 12:41	TRB	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551992	1	09/30/20 19:18	09/30/20 19:58	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 20:11	09/26/20 20:11	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 06:08	09/29/20 06:08	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	100	09/29/20 06:26	09/29/20 06:26	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:12	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	5	09/30/20 14:38	10/01/20 09:05	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	5	09/29/20 17:48	10/02/20 12:41	TRB	Mt. Juliet, TN

SMW-2 L1265820-07 GW

Collected by: SJE | Collected date/time: 09/22/20 14:40 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	10/02/20 12:44	10/02/20 12:44	TRB	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551103	1	09/29/20 18:59	09/29/20 19:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 20:26	09/26/20 20:26	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 06:45	09/29/20 06:45	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	100	09/29/20 07:03	09/29/20 07:03	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:15	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	5	09/30/20 14:38	10/01/20 09:07	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	5	09/29/20 17:48	10/02/20 12:44	TRB	Mt. Juliet, TN

DUP L1265820-08 GW

Collected by: SJE | Collected date/time: 09/22/20 00:00 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	10/02/20 12:46	10/02/20 12:46	TRB	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551103	1	09/29/20 18:59	09/29/20 19:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 20:33	09/26/20 20:33	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 07:21	09/29/20 07:21	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	100	09/29/20 07:40	09/29/20 07:40	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:24	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	5	09/30/20 14:38	10/01/20 09:15	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	5	09/29/20 17:48	10/02/20 12:46	TRB	Mt. Juliet, TN

FPW L1265820-09 GW

Collected by: SJE | Collected date/time: 09/22/20 13:35 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	09/30/20 00:26	09/30/20 00:26	JDG	Mt. Juliet, TN
Calculated Results	WG1550839	1	09/30/20 00:26	09/30/20 00:26	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551103	1	09/29/20 18:59	09/29/20 19:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 20:41	09/26/20 20:41	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 08:35	09/29/20 08:35	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	5	09/29/20 09:30	09/29/20 09:30	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:26	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	1	09/29/20 17:48	09/30/20 00:26	JDG	Mt. Juliet, TN

DH-96 L1265820-10 GW

Collected by: SJE | Collected date/time: 09/23/20 12:40 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	09/30/20 00:29	09/30/20 00:29	JDG	Mt. Juliet, TN
Calculated Results	WG1550839	1	09/30/20 00:29	09/30/20 00:29	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551402	1	09/29/20 20:20	09/29/20 20:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 20:48	09/26/20 20:48	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	1	09/29/20 10:07	09/29/20 10:07	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	10	09/29/20 10:26	09/29/20 10:26	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:29	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	1	09/29/20 17:48	09/30/20 00:29	JDG	Mt. Juliet, TN

DH-122 L1265820-11 GW

Collected by: SJE | Collected date/time: 09/23/20 11:25 | Received date/time: 09/24/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1550839	1	09/30/20 00:32	09/30/20 00:32	JDG	Mt. Juliet, TN
Calculated Results	WG1550839	1	09/30/20 00:32	09/30/20 00:32	EL	Mt. Juliet, TN
Gravimetric Analysis by Method 2540 C-2011	WG1551402	1	09/29/20 20:20	09/29/20 20:30	VRP	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1549401	1	09/26/20 20:55	09/26/20 20:55	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1549130	20	09/29/20 11:03	09/29/20 11:03	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1549443	1	09/30/20 14:38	10/01/20 01:32	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1550839	1	09/29/20 17:48	09/30/20 00:32	JDG	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward

Chris Ward
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.20		1	09/29/2020 23:56	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	1660		2.50	1	09/29/2020 23:56	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	3260		20.0	1	09/30/2020 19:58	WG1551992

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	277		20.0	1	09/26/2020 19:34	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 19:34	WG1549401

Sample Narrative:

L1265820-01 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	18.2		1.00	1	09/29/2020 02:26	WG1549130
Fluoride	1.75		0.150	1	09/29/2020 02:26	WG1549130
Sulfate	1870		500	100	09/29/2020 02:45	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 00:57	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 00:57	WG1549443
Barium,Dissolved	0.0150		0.00500	1	10/01/2020 00:57	WG1549443
Boron,Dissolved	0.529		0.200	1	10/01/2020 00:57	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 00:57	WG1549443
Calcium	507		1.00	1	09/29/2020 23:56	WG1550839
Calcium,Dissolved	537		1.00	1	10/01/2020 00:57	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 00:57	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 00:57	WG1549443
Magnesium	94.7		1.00	1	09/29/2020 23:56	WG1550839
Magnesium,Dissolved	91.3		1.00	1	10/01/2020 00:57	WG1549443
Manganese,Dissolved	ND		0.0100	1	10/01/2020 00:57	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 00:57	WG1549443
Potassium,Dissolved	10.5		2.00	1	10/01/2020 00:57	WG1549443
Selenium,Dissolved	0.0913		0.0100	1	10/01/2020 00:57	WG1549443
Sodium	393		3.00	1	09/29/2020 23:56	WG1550839
Sodium,Dissolved	381		3.00	1	10/01/2020 00:57	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	21.9		1	10/02/2020 12:38	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	2600		12.5	1	10/02/2020 12:38	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	10400		40.0	1	09/30/2020 19:58	WG1551992

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	873		20.0	1	09/26/2020 19:42	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 19:42	WG1549401

Sample Narrative:

L1265820-02 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	874		100	100	09/29/2020 03:22	WG1549130
Fluoride	0.276		0.150	1	09/29/2020 03:03	WG1549130
Sulfate	5850		500	100	09/29/2020 03:22	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 01:00	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:00	WG1549443
Barium,Dissolved	0.0140		0.00500	1	10/01/2020 01:00	WG1549443
Boron,Dissolved	0.287		0.200	1	10/01/2020 01:00	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:00	WG1549443
Calcium	455		5.00	5	10/02/2020 12:38	WG1550839
Calcium,Dissolved	484		1.00	1	10/01/2020 01:00	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:00	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:00	WG1549443
Magnesium	355		5.00	5	10/02/2020 12:38	WG1550839
Magnesium,Dissolved	345		1.00	1	10/01/2020 01:00	WG1549443
Manganese,Dissolved	2.26		0.0100	1	10/01/2020 01:00	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 01:00	WG1549443
Potassium,Dissolved	22.0		2.00	1	10/01/2020 01:00	WG1549443
Selenium,Dissolved	0.0138		0.0100	1	10/01/2020 01:00	WG1549443
Sodium	2570		15.0	5	10/02/2020 12:38	WG1550839
Sodium,Dissolved	2570		15.0	5	10/01/2020 09:02	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	2.41		1	09/30/2020 00:03	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	2210		2.50	1	09/30/2020 00:03	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	3540		20.0	1	09/29/2020 19:30	WG1551103

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	554		20.0	1	09/26/2020 19:49	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 19:49	WG1549401

Sample Narrative:

L1265820-03 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	128		50.0	50	09/29/2020 03:59	WG1549130
Fluoride	ND		0.150	1	09/29/2020 03:40	WG1549130
Sulfate	1960		250	50	09/29/2020 03:59	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 01:03	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:03	WG1549443
Barium,Dissolved	0.0384		0.00500	1	10/01/2020 01:03	WG1549443
Boron,Dissolved	ND		0.200	1	10/01/2020 01:03	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:03	WG1549443
Calcium	622		1.00	1	09/30/2020 00:03	WG1550839
Calcium,Dissolved	648		1.00	1	10/01/2020 01:03	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:03	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:03	WG1549443
Magnesium	160		1.00	1	09/30/2020 00:03	WG1550839
Magnesium,Dissolved	157		1.00	1	10/01/2020 01:03	WG1549443
Manganese,Dissolved	18.3		0.0100	1	10/01/2020 01:03	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 01:03	WG1549443
Potassium,Dissolved	19.5		2.00	1	10/01/2020 01:03	WG1549443
Selenium,Dissolved	0.0263		0.0100	1	10/01/2020 01:03	WG1549443
Sodium	261		3.00	1	09/30/2020 00:03	WG1550839
Sodium,Dissolved	262		3.00	1	10/01/2020 01:03	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	6.99		1	09/30/2020 00:06	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	789		2.50	1	09/30/2020 00:06	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	2240		10.0	1	09/29/2020 19:30	WG1551103

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity,Bicarbonate	303		20.0	1	09/26/2020 19:56	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 19:56	WG1549401

Sample Narrative:

L1265820-04 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	56.8		1.00	1	09/29/2020 04:54	WG1549130
Fluoride	2.89		0.150	1	09/29/2020 04:54	WG1549130
Sulfate	1250		500	100	09/29/2020 05:12	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 01:06	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:06	WG1549443
Barium,Dissolved	0.0102		0.00500	1	10/01/2020 01:06	WG1549443
Boron,Dissolved	0.574		0.200	1	10/01/2020 01:06	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:06	WG1549443
Calcium	179		1.00	1	09/30/2020 00:06	WG1550839
Calcium,Dissolved	191		1.00	1	10/01/2020 01:06	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:06	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:06	WG1549443
Magnesium	83.3		1.00	1	09/30/2020 00:06	WG1550839
Magnesium,Dissolved	80.8		1.00	1	10/01/2020 01:06	WG1549443
Manganese,Dissolved	0.0110		0.0100	1	10/01/2020 01:06	WG1549443
Molybdenum,Dissolved	0.00516		0.00500	1	10/01/2020 01:06	WG1549443
Potassium,Dissolved	6.90		2.00	1	10/01/2020 01:06	WG1549443
Selenium,Dissolved	0.0802		0.0100	1	10/01/2020 01:06	WG1549443
Sodium	451		3.00	1	09/30/2020 00:06	WG1550839
Sodium,Dissolved	438		3.00	1	10/01/2020 01:06	WG1549443

Cp
Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.32		1	09/30/2020 00:09	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	1320		2.50	1	09/30/2020 00:09	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1160		10.0	1	09/29/2020 19:30	WG1551103

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	209		20.0	1	09/26/2020 20:03	WG1549401
Alkalinity,Bicarbonate	209		20.0	1	09/26/2020 20:03	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 20:03	WG1549401
Alkalinity,Hydroxide	ND		20.0	1	09/26/2020 20:03	WG1549401

Sample Narrative:

L1265820-05 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	31.6		1.00	1	09/29/2020 05:31	WG1549130
Fluoride	1.05		0.150	1	09/29/2020 05:31	WG1549130
Sulfate	824		50.0	10	09/29/2020 05:49	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 01:09	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:09	WG1549443
Barium,Dissolved	0.0329		0.00500	1	10/01/2020 01:09	WG1549443
Boron,Dissolved	ND		0.200	1	10/01/2020 01:09	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:09	WG1549443
Calcium	351		1.00	1	09/30/2020 00:09	WG1550839
Calcium,Dissolved	260		1.00	1	10/01/2020 01:09	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:09	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:09	WG1549443
Magnesium	109		1.00	1	09/30/2020 00:09	WG1550839
Magnesium,Dissolved	66.8		1.00	1	10/01/2020 01:09	WG1549443
Manganese,Dissolved	ND		0.0100	1	10/01/2020 01:09	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 01:09	WG1549443
Potassium,Dissolved	3.04		2.00	1	10/01/2020 01:09	WG1549443
Selenium,Dissolved	0.0294		0.0100	1	10/01/2020 01:09	WG1549443
Sodium	111		3.00	1	09/30/2020 00:09	WG1550839
Sodium,Dissolved	111		3.00	1	10/01/2020 01:09	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	14.7		1	10/02/2020 12:41	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	1920		12.5	1	10/02/2020 12:41	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	7020		20.0	1	09/30/2020 19:58	WG1551992

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	736		20.0	1	09/26/2020 20:11	WG1549401
Alkalinity,Bicarbonate	736		20.0	1	09/26/2020 20:11	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 20:11	WG1549401
Alkalinity,Hydroxide	ND		20.0	1	09/26/2020 20:11	WG1549401

Sample Narrative:

L1265820-06 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	344		100	100	09/29/2020 06:26	WG1549130
Fluoride	0.155		0.150	1	09/29/2020 06:08	WG1549130
Sulfate	3710		500	100	09/29/2020 06:26	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 01:12	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:12	WG1549443
Barium,Dissolved	0.0191		0.00500	1	10/01/2020 01:12	WG1549443
Boron,Dissolved	0.227		0.200	1	10/01/2020 01:12	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:12	WG1549443
Calcium	467		5.00	5	10/02/2020 12:41	WG1550839
Calcium,Dissolved	503		1.00	1	10/01/2020 01:12	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:12	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:12	WG1549443
Magnesium	182		5.00	5	10/02/2020 12:41	WG1550839
Magnesium,Dissolved	173		1.00	1	10/01/2020 01:12	WG1549443
Manganese,Dissolved	3.48		0.0100	1	10/01/2020 01:12	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 01:12	WG1549443
Potassium,Dissolved	28.0		2.00	1	10/01/2020 01:12	WG1549443
Selenium,Dissolved	0.0102		0.0100	1	10/01/2020 01:12	WG1549443
Sodium	1480		15.0	5	10/02/2020 12:41	WG1550839
Sodium,Dissolved	1460		15.0	5	10/01/2020 09:05	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	15.8		1	10/02/2020 12:44	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	1980		12.5	1	10/02/2020 12:44	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	6460	J3	40.0	1	09/29/2020 19:30	WG1551103

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	1020		20.0	1	09/26/2020 20:26	WG1549401
Alkalinity,Bicarbonate	1020		20.0	1	09/26/2020 20:26	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 20:26	WG1549401
Alkalinity,Hydroxide	ND		20.0	1	09/26/2020 20:26	WG1549401

Sample Narrative:

L1265820-07 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	740		100	100	09/29/2020 07:03	WG1549130
Fluoride	0.269		0.150	1	09/29/2020 06:45	WG1549130
Sulfate	3260		500	100	09/29/2020 07:03	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 01:15	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:15	WG1549443
Barium,Dissolved	0.0112		0.00500	1	10/01/2020 01:15	WG1549443
Boron,Dissolved	0.341		0.200	1	10/01/2020 01:15	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:15	WG1549443
Calcium	491		5.00	5	10/02/2020 12:44	WG1550839
Calcium,Dissolved	521		1.00	1	10/01/2020 01:15	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:15	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:15	WG1549443
Magnesium	184		5.00	5	10/02/2020 12:44	WG1550839
Magnesium,Dissolved	173		1.00	1	10/01/2020 01:15	WG1549443
Manganese,Dissolved	0.504		0.0100	1	10/01/2020 01:15	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 01:15	WG1549443
Potassium,Dissolved	16.3		2.00	1	10/01/2020 01:15	WG1549443
Selenium,Dissolved	0.0126		0.0100	1	10/01/2020 01:15	WG1549443
Sodium	1610		15.0	5	10/02/2020 12:44	WG1550839
Sodium,Dissolved	1550		15.0	5	10/01/2020 09:07	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	15.8		1	10/02/2020 12:46	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	1960		12.5	1	10/02/2020 12:46	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	6860		40.0	1	09/29/2020 19:30	WG1551103

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	1020		20.0	1	09/26/2020 20:33	WG1549401
Alkalinity,Bicarbonate	1020		20.0	1	09/26/2020 20:33	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 20:33	WG1549401
Alkalinity,Hydroxide	ND		20.0	1	09/26/2020 20:33	WG1549401

Sample Narrative:

L1265820-08 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	728		100	100	09/29/2020 07:40	WG1549130
Fluoride	0.283		0.150	1	09/29/2020 07:21	WG1549130
Sulfate	3200		500	100	09/29/2020 07:40	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony,Dissolved	ND		0.0100	1	10/01/2020 01:24	WG1549443
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:24	WG1549443
Barium,Dissolved	0.0111		0.00500	1	10/01/2020 01:24	WG1549443
Boron,Dissolved	0.339		0.200	1	10/01/2020 01:24	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:24	WG1549443
Calcium	486		5.00	5	10/02/2020 12:46	WG1550839
Calcium,Dissolved	527		1.00	1	10/01/2020 01:24	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:24	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:24	WG1549443
Magnesium	181		5.00	5	10/02/2020 12:46	WG1550839
Magnesium,Dissolved	175		1.00	1	10/01/2020 01:24	WG1549443
Manganese,Dissolved	0.485		0.0100	1	10/01/2020 01:24	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 01:24	WG1549443
Potassium,Dissolved	16.3		2.00	1	10/01/2020 01:24	WG1549443
Selenium,Dissolved	ND		0.0100	1	10/01/2020 01:24	WG1549443
Sodium	1600		15.0	5	10/02/2020 12:46	WG1550839
Sodium,Dissolved	1580		15.0	5	10/01/2020 09:15	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.40		1	09/30/2020 00:26	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	502		2.50	1	09/30/2020 00:26	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	854		10.0	1	09/29/2020 19:30	WG1551103

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	199		20.0	1	09/26/2020 20:41	WG1549401
Alkalinity,Bicarbonate	199		20.0	1	09/26/2020 20:41	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 20:41	WG1549401
Alkalinity,Hydroxide	ND		20.0	1	09/26/2020 20:41	WG1549401

Sample Narrative:

L1265820-09 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	34.7		1.00	1	09/29/2020 08:35	WG1549130
Sulfate	197		25.0	5	09/29/2020 09:30	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:26	WG1549443
Barium,Dissolved	0.0668		0.00500	1	10/01/2020 01:26	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:26	WG1549443
Calcium	136		1.00	1	09/30/2020 00:26	WG1550839
Calcium,Dissolved	146		1.00	1	10/01/2020 01:26	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:26	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:26	WG1549443
Magnesium	39.2		1.00	1	09/30/2020 00:26	WG1550839
Magnesium,Dissolved	37.8		1.00	1	10/01/2020 01:26	WG1549443
Manganese,Dissolved	ND		0.0100	1	10/01/2020 01:26	WG1549443
Molybdenum,Dissolved	ND		0.00500	1	10/01/2020 01:26	WG1549443
Selenium,Dissolved	ND		0.0100	1	10/01/2020 01:26	WG1549443
Sodium	71.9		3.00	1	09/30/2020 00:26	WG1550839
Sodium,Dissolved	68.8		3.00	1	10/01/2020 01:26	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.26		1	09/30/2020 00:29	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	485		2.50	1	09/30/2020 00:29	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1310		10.0	1	09/29/2020 20:30	WG1551402

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	285		20.0	1	09/26/2020 20:48	WG1549401
Alkalinity,Bicarbonate	285		20.0	1	09/26/2020 20:48	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 20:48	WG1549401
Alkalinity,Hydroxide	ND		20.0	1	09/26/2020 20:48	WG1549401

Sample Narrative:

L1265820-10 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	33.9		1.00	1	09/29/2020 10:07	WG1549130
Sulfate	729		50.0	10	09/29/2020 10:26	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:29	WG1549443
Barium,Dissolved	0.00965		0.00500	1	10/01/2020 01:29	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:29	WG1549443
Calcium	111		1.00	1	09/30/2020 00:29	WG1550839
Calcium,Dissolved	120		1.00	1	10/01/2020 01:29	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:29	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:29	WG1549443
Magnesium	50.5		1.00	1	09/30/2020 00:29	WG1550839
Magnesium,Dissolved	49.9		1.00	1	10/01/2020 01:29	WG1549443
Manganese,Dissolved	0.523		0.0100	1	10/01/2020 01:29	WG1549443
Molybdenum,Dissolved	0.00622		0.00500	1	10/01/2020 01:29	WG1549443
Selenium,Dissolved	ND		0.0100	1	10/01/2020 01:29	WG1549443
Sodium	266		3.00	1	09/30/2020 00:29	WG1550839
Sodium,Dissolved	260		3.00	1	10/01/2020 01:29	WG1549443

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.13		1	09/30/2020 00:32	WG1550839

Calculated Results

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	750		2.50	1	09/30/2020 00:32	WG1550839

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	1850		10.0	1	09/29/2020 20:30	WG1551402

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	295		20.0	1	09/26/2020 20:55	WG1549401
Alkalinity,Bicarbonate	295		20.0	1	09/26/2020 20:55	WG1549401
Alkalinity,Carbonate	ND		20.0	1	09/26/2020 20:55	WG1549401
Alkalinity,Hydroxide	ND		20.0	1	09/26/2020 20:55	WG1549401

Sample Narrative:

L1265820-11 WG1549401: Endpoint pH 4.5

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	128		20.0	20	09/29/2020 11:03	WG1549130
Sulfate	953		100	20	09/29/2020 11:03	WG1549130

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Arsenic,Dissolved	ND		0.0100	1	10/01/2020 01:32	WG1549443
Barium,Dissolved	0.0229		0.00500	1	10/01/2020 01:32	WG1549443
Cadmium,Dissolved	ND		0.00200	1	10/01/2020 01:32	WG1549443
Calcium	194		1.00	1	09/30/2020 00:32	WG1550839
Calcium,Dissolved	213		1.00	1	10/01/2020 01:32	WG1549443
Iron,Dissolved	ND		0.100	1	10/01/2020 01:32	WG1549443
Lead,Dissolved	ND		0.00600	1	10/01/2020 01:32	WG1549443
Magnesium	64.5		1.00	1	09/30/2020 00:32	WG1550839
Magnesium,Dissolved	64.0		1.00	1	10/01/2020 01:32	WG1549443
Manganese,Dissolved	0.473		0.0100	1	10/01/2020 01:32	WG1549443
Molybdenum,Dissolved	0.00757		0.00500	1	10/01/2020 01:32	WG1549443
Selenium,Dissolved	ND		0.0100	1	10/01/2020 01:32	WG1549443
Sodium	323		3.00	1	09/30/2020 00:32	WG1550839
Sodium,Dissolved	318		3.00	1	10/01/2020 01:32	WG1549443

Method Blank (MB)

(MB) R3576215-1 09/29/20 19:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1265499-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1265499-05 09/29/20 19:30 • (DUP) R3576215-3 09/29/20 19:30

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	2640	2810	1	6.10	J3	5

L1265820-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1265820-07 09/29/20 19:30 • (DUP) R3576215-4 09/29/20 19:30

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	6460	7170	1	10.3	J3	5

Laboratory Control Sample (LCS)

(LCS) R3576215-2 09/29/20 19:30

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8540	97.0	77.4-123	

Cp
Tc
Ss
Cn
Sr
Qc
Gl
Al
Sc

Method Blank (MB)

(MB) R3576226-1 09/29/20 20:30

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L1265597-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1265597-02 09/29/20 20:30 • (DUP) R3576226-3 09/29/20 20:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	509	522	1	2.52		5

L1265710-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1265710-04 09/29/20 20:30 • (DUP) R3576226-4 09/29/20 20:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	2990	3000	1	0.334		5

Laboratory Control Sample (LCS)

(LCS) R3576226-2 09/29/20 20:30

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Dissolved Solids	8800	8640	98.2	77.4-123	

Method Blank (MB)

(MB) R3576769-1 09/30/20 19:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L1265820-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1265820-02 09/30/20 19:58 • (DUP) R3576769-3 09/30/20 19:58

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	10400	10500	1	0.839		5

L1266826-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1266826-01 09/30/20 19:58 • (DUP) R3576769-4 09/30/20 19:58

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	3030	3020	1	0.264		5

Laboratory Control Sample (LCS)

(LCS) R3576769-2 09/30/20 19:58

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Dissolved Solids	8800	8370	95.1	77.4-123	

Method Blank (MB)

(MB) R3574865-1 09/26/20 19:04

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	U		8.45	20.0
Alkalinity,Bicarbonate	U		8.45	20.0
Alkalinity,Carbonate	U		8.45	20.0
Alkalinity,Hydroxide	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1265724-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1265724-01 09/26/20 19:11 • (DUP) R3574865-2 09/26/20 19:19

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	305	306	1	0.227		20
Alkalinity,Bicarbonate	305	306	1	0.227		20
Alkalinity,Carbonate	ND	ND	1	0.000		20
Alkalinity,Hydroxide	ND	ND	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

L1265828-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1265828-07 09/26/20 22:05 • (DUP) R3574865-4 09/26/20 22:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	77.4	77.2	1	0.196		20
Alkalinity,Bicarbonate	77.4	77.2	1	0.196		20
Alkalinity,Carbonate	ND	ND	1	0.000		20
Alkalinity,Hydroxide	ND	ND	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3574865-3 09/26/20 20:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	99.8	99.8	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3575680-1 09/28/20 21:20

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1265734-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1265734-08 09/28/20 23:10 • (DUP) R3575680-3 09/28/20 23:28

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	52.6	52.6	1	0.0502		15
Fluoride	0.360	0.375	1	4.13		15
Sulfate	7.87	8.02	1	1.79		15

L1265820-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1265820-09 09/29/20 08:35 • (DUP) R3575680-6 09/29/20 08:54

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	34.7	34.7	1	0.135		15
Fluoride	1.31	1.33	1	1.57		15

L1265820-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1265820-09 09/29/20 09:30 • (DUP) R3575680-8 09/29/20 09:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	197	200	5	1.37		15

Laboratory Control Sample (LCS)

(LCS) R3575680-2 09/28/20 21:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	40.2	100	80.0-120	
Fluoride	8.00	8.20	102	80.0-120	
Sulfate	40.0	41.1	103	80.0-120	

L1265734-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1265734-11 09/28/20 23:46 • (MS) R3575680-4 09/29/20 00:05 • (MSD) R3575680-5 09/29/20 00:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	87.8	132	133	88.5	89.5	1	80.0-120	E	E	0.392	15
Fluoride	5.00	0.988	5.75	5.78	95.3	95.9	1	80.0-120			0.541	15
Sulfate	50.0	32.7	80.6	80.6	95.7	95.8	1	80.0-120			0.0517	15

L1265820-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1265820-09 09/29/20 08:35 • (MS) R3575680-7 09/29/20 09:12

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	34.7	84.6	99.8	1	80.0-120	
Fluoride	5.00	1.31	6.34	101	1	80.0-120	
Sulfate	50.0	203	245	84.9	1	80.0-120	E

Method Blank (MB)

(MB) R3576417-1 10/01/20 00:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.00430	0.0100
Arsenic,Dissolved	U		0.00440	0.0100
Barium,Dissolved	U		0.000736	0.00500
Boron,Dissolved	U		0.0200	0.200
Cadmium,Dissolved	U		0.000479	0.00200
Calcium,Dissolved	U		0.0793	1.00
Iron,Dissolved	U		0.0180	0.100
Lead,Dissolved	U		0.00299	0.00600
Magnesium,Dissolved	U		0.0853	1.00
Manganese,Dissolved	U		0.000934	0.0100
Molybdenum,Dissolved	U		0.00116	0.00500
Potassium,Dissolved	U		0.261	2.00
Selenium,Dissolved	U		0.00735	0.0100
Sodium,Dissolved	U		0.504	3.00

Laboratory Control Sample (LCS)

(LCS) R3576417-2 10/01/20 00:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony,Dissolved	1.00	0.948	94.8	80.0-120	
Arsenic,Dissolved	1.00	0.947	94.7	80.0-120	
Barium,Dissolved	1.00	1.01	101	80.0-120	
Boron,Dissolved	1.00	1.01	101	80.0-120	
Cadmium,Dissolved	1.00	0.977	97.7	80.0-120	
Calcium,Dissolved	10.0	10.2	102	80.0-120	
Iron,Dissolved	10.0	10.0	100	80.0-120	
Lead,Dissolved	1.00	0.976	97.6	80.0-120	
Magnesium,Dissolved	10.0	9.79	97.9	80.0-120	
Manganese,Dissolved	1.00	0.996	99.6	80.0-120	
Molybdenum,Dissolved	1.00	1.02	102	80.0-120	
Potassium,Dissolved	10.0	9.41	94.1	80.0-120	
Selenium,Dissolved	1.00	0.986	98.6	80.0-120	
Sodium,Dissolved	10.0	10.1	101	80.0-120	

L1265734-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1265734-08 10/01/20 00:21 • (MS) R3576417-4 10/01/20 00:26 • (MSD) R3576417-5 10/01/20 00:29

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	1.00	ND	0.951	0.963	95.1	96.3	1	75.0-125			1.24	20
Arsenic,Dissolved	1.00	0.0193	0.981	0.981	96.1	96.1	1	75.0-125			0.00630	20
Barium,Dissolved	1.00	0.631	1.58	1.59	94.8	95.8	1	75.0-125			0.604	20
Boron,Dissolved	1.00	0.596	1.57	1.56	97.5	96.9	1	75.0-125			0.429	20
Cadmium,Dissolved	1.00	ND	0.984	0.986	98.4	98.6	1	75.0-125			0.211	20
Calcium,Dissolved	10.0	102	111	111	93.2	89.6	1	75.0-125			0.328	20
Iron,Dissolved	10.0	1.93	11.6	11.6	96.9	96.8	1	75.0-125			0.111	20
Lead,Dissolved	1.00	ND	0.968	0.969	96.8	96.9	1	75.0-125			0.153	20
Magnesium,Dissolved	10.0	42.9	51.2	51.2	83.5	83.2	1	75.0-125			0.0489	20
Manganese,Dissolved	1.00	1.25	2.18	2.18	92.7	93.1	1	75.0-125			0.164	20
Molybdenum,Dissolved	1.00	ND	1.00	1.01	100	101	1	75.0-125			0.516	20
Potassium,Dissolved	10.0	ND	10.5	10.6	92.1	92.5	1	75.0-125			0.408	20
Selenium,Dissolved	1.00	ND	1.03	1.04	103	104	1	75.0-125			0.962	20
Sodium,Dissolved	10.0	146	152	152	53.2	54.6	1	75.0-125	V	V	0.0936	20

Method Blank (MB)

(MB) R3575945-1 09/29/20 23:16

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Calcium	U		0.0793	1.00
Magnesium	U		0.0853	1.00
Sodium	U		0.504	3.00

Laboratory Control Sample (LCS)

(LCS) R3575945-2 09/29/20 23:18

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Calcium	10.0	9.99	99.9	80.0-120	
Magnesium	10.0	9.89	98.9	80.0-120	
Sodium	10.0	9.91	99.1	80.0-120	

L1265784-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1265784-01 09/29/20 23:21 • (MS) R3575945-4 09/29/20 23:26 • (MSD) R3575945-5 09/29/20 23:29

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Calcium	10.0	14.2	23.9	23.8	96.6	95.9	1	75.0-125			0.268	20
Magnesium	10.0	1.02	10.7	10.7	96.9	97.2	1	75.0-125			0.320	20
Sodium	10.0	10.3	19.9	19.9	96.1	95.8	1	75.0-125			0.131	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J3	The associated batch QC was outside the established quality control range for precision.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

American Environmental - CO

8191 Southpark Lane
Suite 107
Littleton, CO 80120

Billing Information:
Accounts Payable
8191 Southpark Lane
Suite 107
Littleton, CO 80120

Pres Chk

Report to: Jordan Adkins

Email To: jadkins@aecdenver.com;mbucari@aecdenver.c

Project Description: Keenesburg Mine

City/State Collected:

Please Circle: PT MT CT ET

Phone: 303-948-7733

Client Project #

Lab Project # AMEENVLCO-KEENESBURG

Collected by (print): SJE

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1265820
1171

Acctnum: AMEENVLCO
Template: T160430
Prelogin: P796947
PM: 824 - Chris Ward
PB:

Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALKBI,ALKCA 250mlHDPE-NoPres	Cl,F,SO4 125mlHDPE-NoPres	Diss Metals 250mlHDPE-NoPres	HARD 250mlHDPE-HNO3	SAR 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres	V8260 40mlAmb-HCl-Blk	Remarks	Sample # (lab only)
PC-1		GW		9/23	9:10	6	X	X	X	X	X	X			-01
PC-2		GW		9/23	8:40	6	X	X	X	X	X	X			-02
PC-5		GW		9/22	10:30	6	X	X	X	X	X	X			-03
PC-6		GW		9/22	11:00	6	X	X	X	X	X	X			-04
AMW-1		GW		9/22	12:30	6	X	X	X	X	X	X			-05
AMW-2		GW		9/23	9:35	6	X	X	X	X	X	X			-06
SMW-2		GW		9/22	14:40	6	X	X	X	X	X	X			-07
DUP		GW		9/22		6	X	X	X	X	X	X			-08
FPW		GW		9/22	13:35	6	X	X	X	X	X	X			-09
		GW				1							X		

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Diss Metals=As,Ba,B,Ca,Cd,Fe,Kd,Mg,Mn,Na,Pb,Sb,Se
PC-1,PC-2PC-6,AMW-1,AMW-2,SMW-2: Fluoride, SBDICP, BDICP, KDICP
AMW-1,AMW-2,SMW-2,FPW,DH-96,DH-122: ALKOH, ALK

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __UPS ✓FedEx __Courier _____

Temps: 1.2 / 1.3
Tracking # 1922 0802 5644 / 5655

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: ✓Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Stefan Bur	09/23	15:15	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 1.5-3=1.2 °C Bottles Received: 66

If preservation required by Login: Date/Time

Date: 9/24/20 Time: 0930

Hold: Condition: NCF / OK

American Environmental - CO

8191 Southpark Lane
Suite 107
Littleton, CO 80120

Billing Information:
Accounts Payable
8191 Southpark Lane
Suite 107
Littleton, CO 80120

Pres Chk

Report to: Jordan Adkins

Email To: jadkins@aecdenver.com;mbucari@aecdenver.c

Project Description: Keenesburg Mine

City/State Collected:

Please Circle: PT MT CT ET

Phone: 303-948-7733

Client Project #

Lab Project # AMEENVLCO-KEENESBURG

Collected by (print): SJE

Site/Facility ID #

P.O. #

Collected by (signature): Stephen Bucari

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALKBI,ALKCA 250mlHDPE-NoPres	Cl,F,SO4 125mlHDPE-NoPres	Diss Metals 250mlHDPE-NoPres	HARD 250mlHDPE-HNO3	SAR 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres	V8260 40mlAmb-HCl-Blk				Remarks	Sample # (lab only)
DH-96		GW		9/23	12:40	6	X	X	X	X	X	X						-10
DH-122		GW		9/23	11:25	6	X	X	X	X	X	X						-11
		GW				6	X	X	X	X	X	X						

Chain of Custody Page 1 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1265850

Table #

Acctnum: AMEENVLCO
Template: T160430
Prelogin: P796947
PM: 824 - Chris Ward
PB:

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:Diss Metals=As,Ba,B,Ca,Cd,Fe,Kd,Mg,Mn,Na,Pb,Sb,Se
PC-1,PC-2PC-6,AMW-1,AMW-2,SMW-2: Fluoride, SBDICP, BDICP, KDICP
AMW-1,AMW-2,SMW-2,FPW,DH-96,DH-122: ALKOH, ALK

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __UPS ✓ FedEx __ Courier _____

Tracking # same

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Stephen Bucari	09/23	15:15			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.9-3.1 °C Bottles Received: 66	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/24/20 Time: 0930	Hold: Condition: NCF / OK