

EXHIBIT 10
WATER QUALITY ANALYSIS



ARCADIS U.S., Inc.
630 Plaza Drive
Suite 200
Highlands Ranch
Colorado 80129
Tel 720 344 3500
Fax 720 344 3535

MEMO

To
Mr. Ron Thompson
New Elk Coal Company, LLC

Copies
Monica Heintz, ARCADIS

From
Jerry Koblitz
ARCADIS US, Inc.

Date
February 27, 2014

ARCADIS Project No
CO001572.0003.00001

Subject

Assessment of the Influence of Mining Activities at New Elk Mine on Surface Water Quality in the Purgatoire River

1. Introduction

On behalf of New Elk Coal Company, LLC (NECC), ARCADIS U.S. Inc. (ARCADIS) presents this memorandum *Assessment of the Influence of Mining Activities at New Elk Mine on Surface Water Quality at the Purgatoire River* (memo). This memo summarizes geochemical data analysis and modeling conducted in support of assessing potential effects to surface water quality from mine dewatering activities at the New Elk underground coal mine and preparation plant (New Elk Mine). Background information presented here and the data used in analysis and modeling were previously reported in the New Elk Mine Annual Hydrologic Monitoring Report 2012 (NECC 2012).

Production from the Allen Seam at the New Elk Mine occurred intermittently between 1952 and 1988. In 1988, the mine was temporally sealed and was allowed to flood. Between February 2001 and November 2008 depth to water in the mine and mine water quality were monitored. In December 2008, active dewatering of the mine began in order to prepare for mine rehabilitation. Mining activities were resumed in late 2011 with mining of the Blue Seam, and in January 2012 mining in the Allen Seam was resumed. Additional details regarding past and current facility operations, as well as environmental monitoring and compliance programs at the New Elk Mine are presented in the Annual Hydrogeologic Monitoring Report 2012 (NECC 2012) and in National Pollution Discharge Elimination System (NPDES) permit documentation.

ARCADIS

The New Elk Mine is located at the Middle Fork of the Purgatoire River in Las Animas County, Colorado, approximately 1.5 miles upstream of the confluence of the North Fork, and on stream segment number COARLA05a of the Lower Arkansas River. Coal mining has historically been conducted in an area called the Picketwire Valley, underneath as well as north and south of the Purgatoire River. Following temporary mine closure and cessation of dewatering in 1988, lower areas of the mine gradually flooded. In 2008, dewatering activities were resumed (NECC 2012). The purpose of the geochemical analyses and modeling presented in this memo was to assess if mine dewatering activities have influenced or may be expected to influence surface water quality in the Purgatoire River.

Relevant geologic units in the area of the mine include recent alluvial deposits and the Raton Formation. Recent alluvium is deposited in channels that cut various geologic formations along the Purgatoire River, including the Raton Formation. Groundwater in recent alluvium is hydraulically connected with the Purgatoire River. The Raton Formation is characterized by very fine- to medium- grained sandstone interbedded with siltstone and shale, and is the formation in which mined coal is located (NECC 2012).

Surface water availability is related to precipitation in the drainage area, mean annual precipitation near the mine is estimated at approximately 16.92 inches. Discharge rates in the Purgatoire River have been historically measured at stations upstream and downstream of the mine. Between 1978 and 1981, discharge rates between 2.8 and 522 cubic feet per second (cfs) were measured upstream of the mine at United States Geologic Survey (USGS) station Stonewall (07124050). Between 1972 and 2011 the average annual discharge at downstream USGS station Madrid (07124200) was 69.5 cfs. Water quality of the Purgatoire River is controlled by the quantity of flow and the materials through which the water flows. At lower flow rates and further downstream higher electrical conductivity (EC) measurements are reported (NECC 2012; Tetra Tech Inc. [Tetra Tech] 2012).

Because water in the COARLA05a segment of the Lower Arkansas River is designated for beneficial use for agriculture, and as a result of high ionic strength of mine waters, and particularly the high proportion of sodium relative to calcium and magnesium (**Section 3**), discharge of mine waters requires consideration of the defined EC and sodium adsorption ratio (SAR) criteria protective of the most salt sensitive crop that may be irrigated with water from the Purgatoire River downstream of the mine – alfalfa (Water Quality Control Board [WQCB] 2008, Tetra Tech 2012). These considerations have been addressed with a simple geochemical mixing model, as discussed in **Section 5**.

2. Summary of Site Data Used Analysis

Surface and groundwater monitoring programs have been conducted at the mine since February 1984. The monitoring program at the mine has historically included sampling of surface water at the Purgatoire River, ponds and alluvial wells, springs and seeps, mine water, bedrock wells, and discharge points. For the purpose of this assessment, historical monitoring data from two surface water stations, four alluvial

ARCADIS

wells, and two mine water stations were utilized (**Figure 1**). Data used in this assessment were collected from the following sampling stations:

- PRS-1: A surface water monitoring station on the Middle Fork of the Purgatoire River upstream of mining activities at the New Elk Mine facility. Data collected between 1984 and 2012 were included in the assessment of water quality at this station.
- PRS-4: A surface monitoring water station on the Purgatoire River downstream of the New Elk Mine surface facilities. Data collected between 1992 and 2011 were included in the assessment of water quality at this station
- PAW-1: An alluvial groundwater monitoring well located adjacent to PRS-1, upgradient of mining activities. Data collected between 1984 and 2012 were included in the assessment of water quality at this station.
- PAW-2: An alluvial groundwater monitoring well located north of the Purgatoire River, approximately 200 yards downstream of PAW-1 and downgradient of the underground coal development refuse pile. Data collected between 1984 and 2012 were included in the assessment of water quality at this station.
- PAW-8: An alluvial groundwater monitoring well located on the north bank of the Purgatoire River installed with the purpose of monitoring the Refuse Disposal Area. Data collected between 1994 and 2012 were included in the assessment of water quality at this station.
- PAW-9: An alluvial groundwater monitoring well installed on the south bank of the Purgatoire River, downgradient of mining activities, near surface water monitoring station PRS-4. Data collected between 1994 and 2012 were included in the assessment of water quality at this station.
- NEW-2: A mine water monitoring station located at the East Portal shaft of the New Elk Mine. Data collected between 1995 and 2012 were included in the assessment of water quality at this station.
- NEW-4: A mine water monitoring station located in a known flooded portion of the mine (near the conveyor belt). Data collected between 1995 and 2012 were included in the assessment of water quality at this station.

Water quality data from each of these stations was examined to determine if mining activities appear to influence water quality of the Purgatoire River.

3. Geochemical Characterization of Water Types

Piper diagrams were created to graphically classify waters based on their ionic compositions. These diagrams are a common tool used for comparing and classifying waters, and for assessing potential mixing between water types. Piper diagrams are created by: (1) calculating the ternary proportions of cations (calcium, magnesium, and sodium plus potassium) and anions (carbonate plus bicarbonate, sulfate and chloride) in milliequivalents per liter; (2) plotting the resulting compositions on two ternary diagrams; and (3) projecting these compositions onto a diamond shaped chart. For this analysis, the

ARCADIS

United States Geological Survey (USGS) Gw_Chart tool (http://water.usgs.gov/nrp/gwsoftware/GW_Chart/GW_Chart.html) was used to create Piper diagrams. Because the Piper diagram method is based on the calculation of ternary ratios, exclusion of any ionic species from the calculation based on a lack of data during a single sampling event may result in a skewed result that is not representative of the water type. Therefore, at each monitoring location, data was selected from dates where analytical results were reported all relevant ionic species. Average concentrations of each ionic species over the full period of monitoring were used to determine the average water composition for each sampling location. In addition to comparing the ionic compositions of waters, historical average values of: pH, total dissolved solids (TDS), EC, total iron, total recoverable iron, dissolved iron, total manganese and dissolved manganese were compared between sampling stations.

The characteristics of surface water samples collected at upstream (PRS-1) and downstream (PRS-4) stations are similar to one another and are distinct from the composition of mine waters (NEW-2 and NEW-4) (**Figure 2, Table 1**). The concentration of TDS and EC values measured in surface water are lower than those measured in mine water (**Table 1**). Surface waters are characterized by a high average proportion of calcium (72.4 to 73.5 percent) and similar average proportions of magnesium (13.1 to 13.3 percent) and sodium plus potassium (13.3 to 14.5 percent). In contrast, mine waters are characterized by a high average proportion of sodium plus potassium (95.6 to 98.2 percent) with a dominant contribution from sodium – 279 to 619 mg/L sodium, compared to 6 to 6.4 mg/L potassium. Surface waters are also characterized by lower carbonate plus bicarbonate concentrations (140.6 to 140 mg/L) than mine waters (544 to 1,417 mg/L). As illustrated by clustering of data points in **Figures 3 and 4** (surface waters) and **Figures 5 and 6** (mine waters) the compositions of these waters show relatively little variability over time. At mine water station NEW-2 (**Figure 9**) two data points appear to be anomalous. These samples were collected in 1996 and 2008 and show a high proportion of calcium, a low proportion of sodium, a low concentration of TDS, and a low EC relative to other samples collected at this location. One data point at surface water station PRS-1 (**Figure 3**) appears to be anomalous, with a relatively low bicarbonate concentration.

As illustrated in **Figures 7 through 10**, the ionic composition of alluvial groundwater shows a greater degree of temporal variability than that of surface waters and mine waters. The EC values and average ionic compositions of alluvial groundwater samples are between those observed in surface waters and mine waters (**Table 1**). Alluvial groundwater has a lower average proportion of calcium than surface water (43.3 to 49.3 percent) and a lower average proportion of sodium plus potassium than mine water (33.0 to 48.1 percent). With the exception of upgradient alluvial well PAW-1, alluvial groundwater samples also have TDS and carbonate plus bicarbonate concentrations between those measured in surface water and mine water. The ionic composition of the upgradient alluvial well (PAW-1) is somewhat distinct from that of downgradient alluvial wells (PAW-2, PAW-8 and PAW-9), with a signature more similar to that of surface water with a higher proportion of calcium relative to sodium, lower concentrations of carbonate plus bicarbonate and TDS, and a lower EC. These results suggest that either mining activities or a change in lithology in the downgradient direction influence groundwater ionic compositions.

ARCADIS

In addition to ionic compositions, pH and metals concentrations have the potential to elucidate potential influence of mining activities on surface water quality. Maximum, minimum and average pH and concentrations of total iron, total recoverable iron, dissolved iron, total manganese, and dissolved manganese are presented in **Table 2**. As shown, there is little variability in pH between surface water, alluvial groundwater, and mine water, with average values ranging between 7.6 and 8.1. Average concentrations of total iron, total recoverable iron, and total manganese are generally higher at alluvial wells, including upgradient well PAW-1, relative to surface water and mine water sampling stations. Because metals concentrations are elevated in the upgradient alluvial well, and are only slightly elevated in mine water relative to surface water, based on the available data presence of these constituents in groundwater and surface water cannot be directly attributed to mining activities.

4. Comparison of Upgradient and Downgradient Surface Water Quality

To evaluate the potential effect of mine dewatering activities on surface water quality in the Purgatoire River, three key water quality parameters were compared over time at upstream station PRS-1 and downstream station PRS-4: total recoverable iron, EC, and SAR (**Figures 11 through 13**).

Iron may serve as an important indicator parameter for the influence of mining activities, although as mentioned in the previous section, the presence of elevated iron concentrations in the upgradient alluvial well suggests that elevated iron concentrations cannot be fully attributed to mining activities. The chronic aquatic life standard for total recoverable iron is 1 mg/L. As shown in **Figure 11**, this concentration was exceeded during one sampling event at PRS-4 in 2008. With the exception of the period between 2006 and 2008, concentrations of total recoverable iron at the upstream and downstream stations show a similar temporal pattern and are similar in magnitude, and therefore do not indicate an influence of mine water discharge on surface water quality.

Waters of the Purgatoire River are designated for beneficial use in agriculture, and the salinity of irrigation water is an important control on rates of water infiltration. Waters with low values of EC (less than 200 to 500 $\mu\text{mhos/cm}$), and waters with high EC values and with high sodium to calcium ratios, tend to reduce the infiltration capacity of soils (Colorado Water Quality Control Division [WQCD] 2008; Ayers and Westcot 1985). Therefore, both the EC and sodium content of waters that may be designated for beneficial use in agriculture must be considered. The SAR is a measure of the sodicity of water and is an expression of the relative concentration of sodium ions to calcium and magnesium ions (WQCD 2008). In cases where high concentrations of bicarbonate are also present (at concentrations exceeding approximately 150 mg/L), the adverse effect of a sodium imbalance may be worsened by the loss of calcium due to carbonate mineral precipitation. In these cases, an index known as the adjusted SAR is most appropriate (WQCD 2008; Lesch and Suarez 2009). The adjusted SAR was calculated for each monitoring event conducted at the upstream and downstream Purgatoire River stations based on the guidance outlined in Lesch and Suarez (2009).

ARCADIS

Figures 12 and 13 present EC and SAR over time at upstream (PRS-1) and downstream (PRS-4) surface water stations. As shown in Figure 12, the EC of upstream and downstream waters are typically similar in magnitude, and with the exception of a few historical periods (e.g. 1994 through 1996, and 2004 through 2007) the temporal trends in EC at these two stations match well. Notably, in 2008 EC dropped significantly at both stations. As shown in Figure 13, the magnitude of and temporal trends in SAR were very similar at upstream and downstream stations until 2009, when the magnitude of the SAR at the downstream station (PRS-4) increased. This result suggests an influence of discharge of sodium-rich waters on downstream surface water quality.

5. Geochemical Mixing Model Results

A dilution model was used to assess the potential impact of mine water discharge on surface water quality in terms of total recoverable iron, EC, and SAR. The following equation was used to estimate the resultant concentrations of calcium, sodium, magnesium, bicarbonate and total recoverable iron as well as the EC of river water downstream from mine water discharge. From the concentrations of the ionic species, the adjusted SAR was calculated according to the guidance outlined in Lesch and Suarez (2008). This model assumes complete mixing.

$$CRiver_{Mixed} = [CRiver \times (\frac{QRiver}{QRiver + QMine})] + [CMine \times (\frac{QMine}{QRiver + QMine})]$$

Where:

$CRiver_{Mixed}$ = Estimated resultant concentration from mine discharge and river mixing (mg/L or μ mhos/cm)

$CRiver$ = Average background concentration in river water (mg/L or μ mhos/cm)

$CMine$ = Average concentration in mine water (mg/L or μ mhos/cm)

$QMine$ = Estimated mine discharge rate (cfs)

$QRiver$ = Estimated river discharge rate (cfs)

For each constituent, the average background concentration in river water was taken as the average concentration at upstream station PRS-1. The average concentration of each constituent in mine water was taken as the average of values measured at the two mine water monitoring stations NEW-2 and NEW-4. As shown in the equation, the magnitude of dilution calculated from this model is based on the relative proportions of mine water discharge and river discharge as components of the total discharge.

Maximum acceptable levels of EC and SAR in waters that may be used for irrigation are provided in the WQCD (2008) guidance for discharge permits. A maximum EC value of 1,300 μ mhos/cm is protective of

alfalfa, the most salt sensitive crop grown in the region. Waters with EC values below this threshold are not expected to impact the 100 percent yield of alfalfa. The maximum allowable SAR is dependent on EC, with higher SAR permissible at higher EC levels, and is defined by the Ayers-Westcot relationship (Ayers and Westcot 1985). **Figure 14** presents this relationship as it is presented in WQCD (2008), with a maximum low-risk capacity value of SAR equal to nine, along with modeling results described below. As illustrated in **Figure 14**, the maximum allowable SAR at an EC of 1,300 $\mu\text{mhos/cm}$ is 6.8, and at EC values below this threshold, the threshold value of SAR that will result in “no reduction in infiltration” decreases. Waters with EC values of approximately 350 $\mu\text{mhos/cm}$ are expected to result in some reduction to infiltration regardless of the SAR.

Figure 14 shows the EC and SAR relationship of Purgatoire River water at PRS-1 (upstream of the mine) as well as the relationship for five modeling scenarios. The average discharge rates at upstream (PRS-1) and downstream (PRS-4) stations over the period of record are 45.9 cfs and 50.8 cfs, respectively. If the mine dewatering rate is assumed to be within the range of calculated mine inflow rates (142 to 468 gallons per minute; NECC 2012), the mine discharge rate is estimated to be between approximately 0.6 and 2 percent of the river discharge rate. Modeling scenarios A and B represent results from modeling with mine discharge equal to 0.6 percent and 2 percent of the total discharge. Model scenario C represents the result from modeling with mine discharge equal to 10 percent of total discharge. Model scenario D represents a back-calculation of the total proportion of mine discharge that would result in a SAR approximately equal to the 6.8 threshold established at an EC value of 1,300 $\mu\text{mhos/cm}$, and illustrates that the EC of the resulting mixture remains too low to meet the criteria for “no reduction in infiltration”. Model scenario E represents a back-calculation of the total proportion of mine discharge that would result in an EC of approximately 1,300 $\mu\text{mhos/cm}$, and illustrates that the SAR of the resulting mixture is too high to meet the criteria for “no reduction in infiltration”. Modeling results are summarized in **Table 3**.

As illustrated in **Figure 14**, Purgatoire river water does not meet the criteria for “no reduction to infiltration” at the upstream sampling location. In the dilution model, the initial characteristics of the river water and mine water dictate the mixing line, and modeling results indicate that the high proportions of sodium and bicarbonate in mine discharge water relative to the background EC of river water and the EC of mine water preclude the resultant mixture from meeting the standard for “no reduction in infiltration”. To meet this standard, the EC of the mixture would need to be increased or the sodium concentration relative calcium and magnesium concentrations would need to be decreased. As shown in **Table 3**, all modeled scenarios meet the aquatic life standard for total recoverable iron (1 mg/L).

6. Conclusions

Surface water in the Purgatoire River and mine water from the New Elk Mine have distinct compositions, and the composition of water in alluvial wells both upgradient and downgradient is an intermediate type. Examination of temporal trends in total recoverable iron, EC, and SAR over time at upstream and downstream stations on the Purgatoire River reveals a change in the SAR at the downstream station that

ARCADIS

may be attributed to the reinitiation of mine dewatering in 2008. An evaluation of surface water composition at the upstream Purgatoire River station reveals that river water does not meet the defined criteria for irrigation water for protection of 100 percent yield of alfalfa. Modeling results indicate that mixing of sodium-rich mine discharge waters with river water results in an increase in the SAR of the resultant mixture, but does not result in a sufficient increase in EC to meet the established criteria for protection of alfalfa yields. Although theoretical surface and mine water mixtures do not result in a composition that is protective of alfalfa yields, when the proportion of mine discharge is maintained below approximately 2 percent of the total discharge, little shift in the composition of surface water is expected.

7. References

Ayers, R.S. and D.S. Westcot. 1985. Water Quality for Agriculture. Food and Agriculture Organization of the United Nations. Paper 29.

Colorado Water Quality Control Division (WQCD). 2008. Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops. Water Quality Permits Policies and Procedures. March 10.

Lesch, S.M. and D.L. Suarez. 2009. Technical Note; A Short Note on Calculating the Adjusted SAR Index. Transactions of the American Society of Agricultural and Biological Engineers. Vol. 52(2): 493-496.

New Elk Coal Company (NECC), LLC. 2012. New Elk Mine Annual Hydrologic Monitoring Report. October 25.

Tetra Tech Inc. (Tetra Tech) 2012. Purgatoire River Watershed Monitoring Raton Basin, Colorado 2012 Monitoring Report. July.

United States Geological Survey (USGS) Gw_Chart tool
(http://water.usgs.gov/nrp/gwsoftware/GW_Chart/GW_Chart.html)

Table 1 - Average ionic composition and ion proportions
New Elk Coal Company, LLC
New Elk Mine

Constituent	Surface Water		Alluvial Wells				Mine Water	
	PRS-1	PRS-4	PAW-1	PAW-2	PAW-8	PAW-9	NEW-2	NEW-4
Average TDS (mg/L)	179	193	122	410.2	580.2	461.8	709	1398
Average EC (µmhos/cm)	284	281.9	390.6	671	844.7	728.8	1075	1932
Average Ca ²⁺ Concentration (mg/L)	46	46.6	21.32	68.3	100	74.6	9.9	8
Ca ²⁺ Proportion of Cations (%)	73.5%	72.4%	49.3%	44.5%	45.8%	43.3%	3.3%	1.3%
Average Mg ²⁺ Concentration (mg/L)	8.3	8.4	7.63	13.2	20.5	14.8	3.1	3.6
Mg ²⁺ Proportion of Cations (%)	13.3%	13.1%	17.7%	8.6%	9.4%	8.6%	1.0%	0.6%
Average Na ⁺ Concentration (mg/L)	7.1	8.1	13.16	69.31	96.1	80.2	279	619
Average K ⁺ Concentration (mg/L)	1.21	1.24	1.11	2.78	1.9	2.6	6.4	6
Na ⁺ plus K ⁺ Proportion of Cations (%)	13.3%	14.5%	33.0%	46.9%	44.9%	48.1%	95.6%	98.2%
Average CO ₃ ²⁻ +HCO ₃ ⁻ Concentration (mg/L)	140.61	139.75	108.56	341	423	350.1	543.5	1417
CO ₃ ²⁻ +HCO ₃ ⁻ Proportion of Anions (%)	79.6%	79.8%	83.3%	82.3%	78.9%	80.9%	90.7%	97.3%
Average Cl ⁻ Concentration (mg/L)	2.1	2.31	6.7	5	15	24.3	7	8.08
Cl ⁻ Proportion of Anions (%)	1.2%	1.3%	5.1%	1.2%	2.8%	5.6%	1.2%	0.6%
Average SO ₄ ²⁻ Concentration (mg/L)	34	33	15	68.3	98.4	58.1	49	30.8
SO ₄ ²⁻ Proportion of Anions (%)	19.2%	18.9%	11.5%	16.5%	18.3%	13.4%	8.2%	2.1%

Notes:

mg/L = milligrams per liter
µmhos/cm = micromho per centimeter
% = percent
TDS = Total dissolved solids
EC = Electrical conductivity
Ca²⁺ = Calcium ion
Mg²⁺ = Magnesium ion
Na⁺ = Sodium ion
K⁺ = potassium ion
CO₃²⁻ = carbonate ion
HCO₃⁻ = bicarbonate ion
Cl⁻ = chloride ion
SO₄²⁻ = sulfate ion

Table 2 - Average ionic composition and ion proportions
New Elk Coal Company, LLC
New Elk Mine

Constituent		Surface Water		Alluvial Wells				Mine Water	
		PRS-1	PRS-4	PAW-1	PAW-2	PAW-8	PAW-9	NEW-2	NEW-4
Field pH (standard)	maximum	8.56	8.5	8.92	8.6	8.9	8.8	8.75	8.4
	minimum	7.38	7.3	7	6.8	6.62	7.32	7.3	7.3
	average	7.96	8	8.1	7.6	7.6	7.9	8.13	7.85
Total Iron (mg/L)	maximum	0.64	0.73	65	608	30.2	8.99	2.15	0.62
	minimum	0.06	0.07	0.015	<0.03	0.43	0.39	0.14	0.07
	average	0.24	0.27	14.8	66	5.6	2.9	0.88	0.35
Total Recoverable Iron (mg/L)	maximum	0.64	1.02	60.7	99.4	29.4	8.16	3.12	0.72
	minimum	0.03	0.11	4.48	5.9	0.12	0.4	0.14	0.01
	average	0.21	0.28	26	47.7	4.4	2.4	1.08	0.29
Dissolved Iron (mg/L)	maximum	0.15 ⁽¹⁾	0.83	0.96	4	0.29	0.47	0.4	0.79
	minimum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0007	<0.01
	average	0.05	0.11	0.04	0.7	0.1	0.19	0.18	0.28
Total Manganese (mg/L)	maximum	0.072	0.078	0.65	2.53	0.8	0.286	0.582	4.1
	minimum	0.013	0.022	0.005	0.021	0.009	0.01	<0.005	<0.005
	average	0.034	0.043	0.14	1.27	0.2	0.1	0.09	0.36
Dissolved Manganese (mg/L)	maximum	0.036	0.042	0.198	1.73	0.101	0.173	0.024	3.8
	minimum	0.006	0.007	<0.005	0.012	<0.005	<0.005	0.005	<0.005
	average	0.017	0.021	0.046	0.984	0.03	0.1	0.01	0.55

Notes:

(1) Data flagged as questionable lab result excluded from statistics
mg/L = milligrams per liter

Table 3 - Geochemical Modeling Results
New Elk Coal Company, LLC
New Elk Mine

	Mixing En
	PRS-1
Percent mine discharge contribution to total flow	0
Estimated Calcium Concentration (mg/L)	46
Estimated Magnesium Concentration (mg/L)	8.3
Estimated Sodium Concentration (mg/L)	7.1
Estimated Bicarbonate Concentration (mg/L)	141
Estimated Total Recoverable Iron Concentration (mg/L)	0.2
Estimated EC (µmhos/cm)	284
Estimated Adjusted SAR	0.27

Notes:

(1) Modeling scenarios described in text

mg/L = milligrams per liter

µmhos/cm = micromho per centimeter

EC = Electrical Conductivity

SAR = Sodium Adsorption Ratio

NA = not applicable

119518
T24

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



Reply to

Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

June 4, 1979

Mr. Jack Gillespie
C F & I Steel Corporation
P O Box 316
Pueblo, Colorado 81002

RE: IAD #97-C543-032-07
Purchase Order # M26144

Corrected Analytical Report

Water samples were received for analyses on ^{APC} March 20, 1979. The samples were given our identification IAD #97-C543-032-07.

This report is to report values for boron after re-analyzing the samples.

The samples were prepared for analyses by filtering through 0.45u pore membrane filters. Barium, calcium, iron, magnesium, manganese and silicon were determined by flame atomic absorption, potassium and sodium by flame atomic emission spectrophotometry, and arsenic and selenium by hydride generation.

The remaining parameters were determined by the methods of U.S. Geological Survey Techniques of Water Resources Investigation, Chapter A1, Book 5.

The results of these analyses are presented in the following tables and are reported in mg/l unless otherwise indicated.

If you have any questions concerning these analyses, please call.

Ernest Appelhaus
Ernest Appelhaus, Analyst

M. L. Jacobs (SS)
M. L. Jacobs, Ph.D., Mgr.
Instrumental Analysis Div.

EA/as



Table No. 1 - Purgatoire River

Date of Sampling: April 19, 1979

Concentration in mg/l

<u>Parameter</u>	<u>East of Allen</u>
Boron, $\mu\text{g/l}$	≤ 30
Calcium	35
Iron	≤ 0.02
Magnesium	6.3
Manganese	≤ 0.01
Potassium	1.2
Silica, SiO_2	6.4
Sodium	49
Total Alkalinity	161
Bicarbonate, HCO_3	190
Chloride	3.0
Specific Conductance, $\mu\text{mhos/cm}$	397
Fluoride	0.4
Hardness (EDTA)	95
Noncarbonate Hardness	0
Nitrate nitrogen	0.60
pH value	8.5
Total dissolved solids @ 180°C	236
Sulfate, SO_4	44
Sodium absorption ratio	2.0



Table No. 2 - Purgatoire River

Date of Sampling: April 19, 1979

Concentration in mg/l

<u>Parameter</u>	<u>Above Maxwell</u>
Boron, $\mu\text{g/l}$	44
Calcium	38
Iron	≤ 0.02
Magnesium	8.4
Manganese	≤ 0.01
Potassium	1.1
Silica, SiO_2	6.4
Sodium	8.1
Total Alkalinity	118
Bicarbonate, HCO_3	144
Chloride	2.4
Specific Conductance, $\mu\text{mhos/cm}$	315
Fluoride	0.2
Hardness (EDTA)	120
Noncarbonate Hardness	0
Nitrate nitrogen	0.05
pH value	8.3
Total dissolved solids @ 180°C	156
Sulfate, SO_4	28
Sodium absorption ratio	0.3



Table No. 3 - Purgatoire River

Date of Sampling: April 19, 1979

Concentration in mg/l

<u>Parameter</u>	<u>Below Maxwell</u>
Boron, $\mu\text{g/l}$	≤ 30
Calcium	41
Iron	≤ 0.02
Magnesium	8.9
Manganese	≤ 0.01
Potassium	1.1
Silica, SiO_2	6.4
Sodium	11
Total Alkalinity	128
Bicarbonate, HCO_3	156
Chloride	2.4
Specific Conductance, $\mu\text{mhos/cm}$	324
Fluoride	0.2
Hardness (EDTA)	120
Noncarbonate Hardness	0
Nitrate nitrogen	0.08
pH value	8.2
Total dissolved solids @ 180°C	174
Sulfate, SO_4	30
Sodium absorption ratio	0.4



Table No. 4 - Purgatoire River

Date of Sampling: April 19, 1979

Concentration in mg/l

<u>Parameter</u>	<u>Above West Portal Allen</u>
Boron, $\mu\text{g/l}$	80
Calcium	33
Iron	≤ 0.02
Magnesium	5.5
Manganese	≤ 0.01
Potassium	1.0
Silica, SiO_2	6.4
Sodium	4.6
Total Alkalinity	100
Bicarbonate, HCO_3	122
Chloride	1.9
Specific Conductance $\mu\text{mhos/cm}$	256
Fluoride	0.2
Hardness (EDTA)	95
Noncarbonate Hardness	0
Nitrate nitrogen	0.08
pH value	8.1
Total dissolved solids @ 180°C	126
Sulfate, SO_4	22
Sodium absorption ratio	0.2



Table No. 5

Date of Sampling: April 19, 1979

Concentration in mg/l

<u>Parameter</u>	<u>Allen Discharge</u>
Arsenic	≤0.002
Barium	0.23
Boron, µg/l	44
Calcium	15
Iron	≤0.02
Magnesium	5.1
Manganese	≤0.01
Potassium	5.2
Selenium	≤0.001
Silica, SiO ₂	6.4
Sodium	320
Total Alkalinity	511
Bicarbonate, HCO ₃	610
Chloride	9.1
Specific Conductance, µmhos/cm	1400
Fluoride	1.3
Hardness (EDTA)	33
Noncarbonate Hardness	0
Nitrate nitrogen	4.6
pH value	8.5
Total dissolved solids @ 180°C	870
Sulfate, SO ₄	190
Sodium absorption ratio	17.9



Table No. 6

Date of Sampling: April 19, 1979

Concentration in mg/l

<u>Parameter</u>	<u>Maxwell Discharge</u>
Arsenic	≤ 0.002
Barium	0.36
Boron, $\mu\text{g/l}$	44
Calcium	2.9
Iron	≤ 0.02
Magnesium	1.2
Manganese	≤ 0.01
Potassium	3.4
Selenium	≤ 0.001
Silica, SiO_2	11
Sodium	310
Total Alkalinity	577
Bicarbonate, HCO_3	703
Chloride	33
Specific Conductance, $\mu\text{mhos/cm}$	1390
Fluoride	3.8
Hardness (EDTA)	≤ 3
Noncarbonate Hardness	0
Nitrate nitrogen	0.54
pH value	7.8
Total dissolved solids @ 180°C	774
Sulfate, SO_4	11
Sodium absorption ratio	39.0



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 728-8434
INSTRUMENTAL ANALYSIS DIVISION. 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

Reply to

To: Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002



Date: April 26, 1979

Analyst: J. Oldham

P. O. No.: M26144

Sample No.: Max discharge 12:30 4/19

IAD No.: 97-C543-032-07

CONCENTRATION IN $\mu\text{g/ml}$

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	<0.007	Terbium		Ruthenium		Vanadium	0.007
Thorium	<0.008	Gadolinium		Molybdenum	0.01	Titanium	0.5
Bismuth		Europium		Niobium	0.002	Scandium	<0.001
Lead	0.008	Samarium		Zirconium	0.006	Calcium	MC
Thallium		Neodymium	<0.002	Yttrium	0.003	Potassium	MC
Mercury	NR	Praseodymium	0.001	Strontium	0.2	Chlorine	*MC
Gold		Cerium	0.01	Rubidium	0.008	Sulfur	0.3
Platinum		Lanthanum	0.01	Bromine	0.008	Phosphorus	0.4
Iridium		Barium	0.5	Selenium	0.005	Silicon	8
Osmium		Cesium	<0.001	Arsenic	0.009	Aluminum	>0.9
Rhenium		Iodine	0.002	Germanium	0.002	Magnesium	1
Tungsten		Tellurium		Gallium	0.003	Sodium	>2
Tantalum		Antimony	0.007	Zinc	0.03	Fluorine	=1
Hafnium		Tin		Copper	0.01	Oxygen	NR
Lutecium		Indium	STD	Nickel	<0.004	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	<0.001	Carbon	NR
Thulium		Silver		Iron	2	Boron	<0.001
Erbium		Palladium		Manganese	0.005	Beryllium	
Holmium		Rhodium		Chromium	0.005	Lithium	0.001
Dysprosium						Hydrogen	NR

STD — Internal Standard

NR — Not Reported

All elements not detected < 0.001 $\mu\text{g/ml}$

MC — Major Component > 10 $\mu\text{g/ml}$

INT — Interference

Approved:
*Heterogeneous

M. J. Specchio

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434
INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

Reply to

To: Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002



Date: April 24, 1979

Analyst: J. Oldham

P. O. No.: M25144

Sample No.: Purgatoire R Below Max 10:55 4/19/79

IAD No.: 97-C543-032-07

CONCENTRATION IN $\mu\text{g/ml}$

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	≤ 0.006	Terbium		Ruthenium		Vanadium	0.03
Thorium	≤ 0.008	Gadolinium		Molybdenum	0.005	Titanium	0.8
Bismuth		Europium		Niobium	≤ 0.005	Scandium	0.002
Lead	0.02	Samarium		Zirconium	0.01	Calcium	MC
Thallium		Neodymium		Yttrium	0.003	Potassium	MC
Mercury	NR	Praseodymium	0.001	Strontium	0.1	Chlorine	0.1
Gold		Cerium	0.01	Rubidium	0.02	Sulfur	2
Platinum		Lanthanum	0.009	Bromine	0.008	Phosphorus	0.2
Iridium		Barium	0.4	Selenium		Silicon	MC
Osmium		Cesium	0.1	Arsenic	≤ 0.002	Aluminum	>0.9
Rhenium		Iodine	0.001	Germanium		Magnesium	4
Tungsten		Tellurium		Gallium	0.003	Sodium	>2
Tantalum		Antimony	≤ 0.002	Zinc	0.006	Fluorine	=0.3
Hafnium		Tin	0.004	Copper	0.01	Oxygen	NR
Lutecium		Indium	STD	Nickel	0.004	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	<0.001	Carbon	NR
Thulium		Silver		Iron	5	Boron	0.002
Erbium		Palladium		Manganese	0.1	Beryllium	
Holmium		Rhodium		Chromium	0.008	Lithium	0.003
Dysprosium						Hydrogen	NR

STD - Internal Standard

NR - Not Reported

All elements not detected < 0.001 $\mu\text{g/ml}$

MC - Major Component MC > 10 $\mu\text{g/ml}$

INT - Interference

Approved:

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434
INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303-278-9521

Reply to

To: Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002



Date: April 26, 1979

Analyst: J. Oldham

P. O. No.: M26144

Sample No.: Allen discharge 1:00 PM

IAD No.: 97-C543-032-07

CONCENTRATION IN $\mu\text{g/ml}$

ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.	ELEMENT	CONC.
Uranium	≤ 0.007	Terbium		Ruthenium		Vanadium	0.02
Thorium	≤ 0.008	Gadolinium		Molybdenum	0.01	Titanium	0.3
Bismuth		Europium		Niobium	0.002	Scandium	≤ 0.001
Lead	≤ 0.004	Samarium		Zirconium	0.006	Calcium	MC
Thallium		Neodymium		Yttrium	0.003	Potassium	MC
Mercury	NR	Praseodymium	0.001	Strontium	0.4	Chlorine	2
Gold		Cerium	0.006	Rubidium	0.008	Sulfur	>6
Platinum		Lanthanum	0.01	Bromine	0.008	Phosphorus	0.04
Iridium		Barium	0.3	Selenium	0.009	Silicon	8
Osmium		Cesium	<0.001	Arsenic	<0.001	Aluminum	>0.9
Rhenium		Iodine	0.001	Germanium	≤ 0.001	Magnesium	4
Tungsten		Tellurium		Gallium	0.003	Sodium	>2
Tantalum		Antimony		Zinc	0.06	Fluorine	=0.8
Hafnium		Tin		Copper	0.01	Oxygen	NR
Lutecium		Indium	STD	Nickel	0.002	Nitrogen	NR
Ytterbium		Cadmium		Cobalt	≤ 0.001	Carbon	NR
Thulium		Silver		Iron	1	Boron	<0.001
Erbium		Palladium		Manganese	0.005	Beryllium	
Holmium		Rhodium		Chromium	0.005	Lithium	
Dysprosium						Hydrogen	NR

STD - Internal Standard

NR - Not Reported

All elements not detected < 0.001 $\mu\text{g/ml}$

MC - Major Component > 10 $\mu\text{g/ml}$

INT - Interference

Approved:

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 725-8434



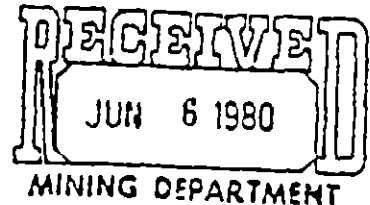
Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

June 4, 1980

Mr. Jack Gillespie
CF&I Steel Corporation
P.O. Box 316
Pueblo, Colorado 81002

RE: IAD #97-E364-032-08
Release No. R-26667
Purchase Order No. M26144



ANALYTICAL REPORT

Eight water samples were received for analyses on April 24, 1980. The samples were given our identification IAD #97-E364-032-08.

The samples were analyzed for calcium, iron, magnesium, manganese, and zinc by flame atomic absorption, for sodium and potassium by flame emission, and for selenium by hydride generation atomic absorption.

Boron was determined colorimetrically. Alkalinity, chloride, fluoride, hardness, pH, sulfate, specific conductance, suspended solids, oil & grease, and dissolved solids were determined by the procedures of Standard Methods, 14th edition. Ion balance and sodium absorption ratio were calculated.

The results of these analyses are presented in the following tables and are reported in mg/l unless otherwise noted.

The Allen Mine 4/22/80, 11:50 sample has an ion balance problem due to a lack of anions. Further work may be needed to make the ions balance.



Table No. 1
Concentration in mg/l

Parameter	#1 Allen Mine 4/22/80 - 11:25	#20 Allen Mine 4/22/80 - 11:45	#30 Allen Mine 4/22/80 - 11:46
Calcium	35	36	36
Iron, total	0.23	0.22	0.28
Magnesium	5.6	5.4	5.9
Manganese, total	0.02	0.02	0.02
Potassium	1.0	1.0	0.8
Selenium (µg/l)	<3	<3	<3
Sodium	3.0	4.3	4.4
Zinc, total	0.002	<0.002	<0.002
Boron, total (µg/l)	2	5	4
Alkalinity, as CaCO ₃	97	108	109
Bicarbonate, HCO ₃	118	131	133
Carbonate, CO ₃	0	0	0
Chloride	2.2	1.8	2.0
Fluoride	0.14	0.17	0.17
Hardness, EDTA, as CaCO ₃	103	94	103
pH value	8.2	8.2	8.2
Sulfate	21	23	23
Specific Conductance (µmhos/cm)	1400	260	260
Dissolved Solids	209	232	172
Suspended Solids	22	26	24
Oil and Grease	4	<4	<4
Sodium Absorption Ratio	0.1	0.2	0.2
Ion Balance (meq/l)	+0.4	+2.0	+1.6

Table No. 2
Concentration in mg/l

Parameter	#4 Allen Mine 4/22/80 - 11:55	#5 Allen Mine 4/22/80 - 12:00
Calcium	8.1	36
Iron, total	0.15	0.37
Magnesium	2.4	5.7
Manganese, total	≤0.003	0.03
Potassium	4.7	1.0
Selenium (µg/l)	≤3	≤3
Sodium	259	7.1
Zinc, total	0.005	≤0.002
Boron, total (µg/l)	2	2
Alkalinity, as CaCO ₃	479	113
Bicarbonate, HCO ₃	578	138
Carbonate, CO ₃	3.4	0
Chloride	5.2	2.2
Fluoride	1.1	0.28
Hardness, EDTA, as CaCO ₃	9.4	98
pH value	8.4	8.3
Sulfate	100	27
Specific Conductance (µmhos/cm)	1200	250
Dissolved Solids	753	150
Suspended Solids	4	24
Oil and Grease	≤4	≤4
Sodium Absorption Ratio	21	0.3
Ion Balance (meq/l)	-0.5	+1.9



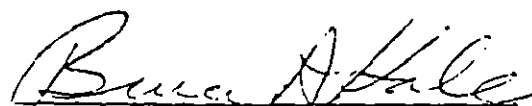
Table No. 3
Concentration in mg/l

<u>Parameter</u>	<u>Allen Mine</u> <u>4/22/80 - 11:50</u>
Calcium	20
Iron, total	0.12
Magnesium	15
Manganese, total	0.005
Potassium	9.4
Selenium ($\mu\text{g/l}$)	8
Sodium	1070
Zinc, total	0.009
Boron, total ($\mu\text{g/l}$)	4
Alkalinity, as CaCO_3	713
Bicarbonate, HCO_3	825
Carbonate, CO_3	59
Chloride	31.0
Fluoride	0.59
Hardness, EDTA, as CaCO_3	100
pH value	8.9
Sulfate	1150
Specific Conductance ($\mu\text{mhos/cm}$)	4800
Dissolved Solids	3570
Suspended Solids	24
Oil and Grease	4
Sodium Absorption Ratio	44
Ion Balance (meq/l)	-11.9

Table No. 4
Concentration in mg/l

<u>Parameter</u>	<u>#8</u> <u>Maxwell Mine</u> <u>4/22/80</u>	<u>#9</u> <u>Maxwell Mine</u> <u>4/22/80 - 1:25</u>
Calcium	36	36
Iron, total	1.4	2.3
Magnesium	6.4	6.8
Manganese, total	0.10	0.08
Potassium	0.9	1.0
Selenium (ug/l)	<u><3</u>	<u><3</u>
Sodium	8.7	6.5
Zinc, total	0.008	0.005
Boron, total (ug/l)	3	2
Alkalinity, as CaCO ₃	120	117
Bicarbonate, HCO ₃	147	142
Carbonate, CO ₃	0	0
Chloride	2.5	2.5
Fluoride	0.22	0.19
Hardness, EDTA, as CaCO ₃	100	106
pH value	8.2	8.2
Sulfate	25	25
Specific Conductance (umhos/cm)	280	280
Dissolved Solids	170	174
Suspended Solids	87	70
Oil and Grease	---	---
Sodium Absorption Ratio	0.4	0.3
Ion Balance (meq/l)	+1.5	+0.9

If you have any questions regarding these analyses, please call.


Bruce A. Hale
Section Supervisor


M. L. Jacobs, Ph.D., Mgr.
Instrumental Analysis Div.

BAH/ams

COMMERCIAL TESTING & ENGINEERING CO.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 726-8434



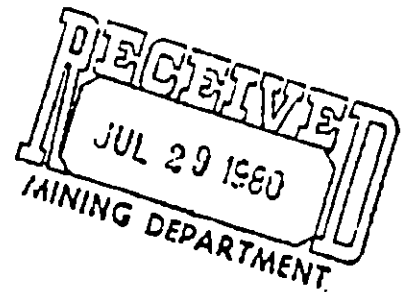
Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

July 24, 1980

Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

Re: IAD #97-E733-032-10
Release #R26675
Purchase Order #M26144



ANALYTICAL REPORT

Ten water samples were received for analyses on July 7, 1980. These samples were given our identification IAD #97-E733-032-10.

The samples were analyzed for total iron, manganese, zinc, magnesium, and calcium by flame atomic absorption for sodium and potassium by flame emission and for selenium by hydride generation atomic absorption.

Boron was determined colorimetrically, sulfate turbidimetrically, chloride and fluoride by specific ion electrode, and dissolved solids (TDS), suspended solids (TSS) and oil and grease (O & G) were determined gravimetrically by the procedures of Standard Methods, 14th edition. pH, carbonate, bicarbonate, alkalinity and specific conductance were all done by Standard Method's procedures. Hardness, sodium absorption ratio, and ion balance were calculated.

Note: Ion Balance calculations are made using dissolved alkali metal numbers (Mg, Ca, Na, and K) and neglecting the use of total heavy metals (Fe, Mn, and Zinc) since they may be assumed to be negligible in the dissolved sample. If the ion balance ratio is high it may be due to small amounts of dissolved heavy metals in the sample, not accounted for. Furthermore, in samples of high pH, alkalinity, relationship calculations may include amounts of hydroxide ion that, although not called for in the analysis, needs to be considered when balancing ions.

Hardness calculations are based on the amounts of dissolved calcium and magnesium in the samples. Again, if hardness numbers are low, it would be due to small amounts of dissolved heavy metals in the samples that are not accounted for. Hardness calculations should not be made including total metals since a digestion puts into solution additional amounts of suspended solids.

The results of these analyses are presented in the following tables and are reported in mg/l unless otherwise noted.



July 24, 1980

TABLE E1

Table No. I
(mg/l)

Parameter	CF&I River Near AL-1-1 7/2/80, 6:00 PM	CF&I AL-1-1 7/2/80, 6:00 PM	CF&I River Near AL-2-1, 7/2/80
Calcium, dissolved	28.0	87.4	30.0
Sodium, dissolved	2.7	43.0	2.9
Magnesium, dissolved	4.2	13.1	4.2
Potassium, dissolved	1.12	2.5	1.3
Iron, total	0.88	205	0.88
Manganese, total	0.025	5.86	0.029
Zinc, total	≤ 0.009	0.913	≤ 0.009
Selenium, total	≤ 0.002	≤ 0.002	≤ 0.002
Boron, total	0.05	0.09	0.03
Alkalinity (as CaCO_3)	72.5	186	70.4
Bicarbonate	88.3	227	85.8
Carbonate	0	0	0
Chloride	3.3	11.7	2.9
Fluoride	0.12	0.20	0.16
Hardness (as CaCO_3)	87.2	468	92.2
pH	7.9	7.3	7.3
Sulfate	8.9	124	11.1
Conductivity ($\mu\text{mhos/cm}$)	140	540	150
Total Dissolved Solids	169	602	121
Total Suspended Solids	17	4500	137
Oil & Grease	16	94	14
Sodium Absorption Ratio	0.1	1.1	0.1
Ion Balance	-1.2	-3.5	-2.0



July 24, 1980

TABLE E1 (continued)

Table No. II
(mg/l)

Parameter	CF&I AL-2-1 7/2/80	CF&I AL-3-3 7/2/80, 4:30 PM	CF&I River Near AL-3-3 7/2/80, 4:30 PM	CF&I AL-4-2 7/2/80, 3:00 PM
Calcium, dissolved	55.2	74.9	29.7	38.3
Sodium, dissolved	244	26.9	5.1	23.7
Magnesium, dissolved	13.2	15.6	4.8	7.6
Potassium, dissolved	6.5	2.5	0.9	1.1
Iron, total	65.0	50.1	22.8	0.49
Manganese, total	0.88	4.98	0.40	0.27
Zinc, total	1.64	0.349	0.080	≤0.009
Selenium, total	0.020	0.003	≤0.002	≤0.002
Boron, total	0.03	0.04	≤0.02	0.03
Alkalinity (as CaCO ₃)	522	275	93.2	143
Bicarbonate	636	336	114	174
Carbonate	0	0	0	0
Chloride	14.0	10.2	5.5	6.8
Fluoride	0.18	0.60	0.20	0.28
Hardness (as CaCO ₃)	192	251	93.9	127
pH	7.4	7.4	7.8	7
Sulfate	198	20.5	11.7	5.
Conductivity (μmhos/cm)	1200	480	170	280
Total dissolved solids	951	404	219	223
Total suspended solids	1090	156	844	5
Oil & Grease	19	21	≤1	2
Sodium Absorption Ratio	7.7	0.7	0.2	0.9
Ion Balance	1.0	0	1.1	-2.8



July 25, 1980

TABLE E2

Table No. III
(mg/l)

Parameter	LA-218A 7/3/80, 4:00 PM	Well 221A 7/2/80	LA-264 11:10 AM 7/3/80
Calcium, dissolved	20.2	1.8	3.3
Sodium, dissolved	244	251	294
Magnesium, dissolved	≤0.2	0.7	1.4
Potassium, dissolved	3.1	2.1	2.3
Iron, total	117	25.9	0.27
Manganese, total	0.88	0.14	≤0.01
Zinc, total	1.14	1.66	0.042
Selenium, total	≤0.002	≤ 0.002	≤0.002
Boron, total	0.16	0.06	0.06
Alkalinity (as CaCO ₃)	579	596	615
Bicarbonate	0	606	749
Carbonate	225	59.6	0
Chloride	14.8	15.0	16.0
Fluoride	2.9	2.8	2.4
Hardness (as CaCO ₃)	50.4	7.4	14.0
pH	11.4	8.8	8.2
Sulfate	33.7	15.0	88
Conductivity (μmhos/cm)	1600	1000	1100
Total dissolved solids	891	775	846
Total suspended solids	6190	85	3
Oil & Grease	9	8	4
Hydroxide	70	-	-
Sodium Absorption Ratio	15	40	34
Ion Balance	3.9	5.5	4.7

If there are any questions concerning these analyses, please call.

Bruce A. Hale
Bruce A. Hale
Section Supervisor

M. L. Jacobs, Ph.D.
M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div. 6/26/80

BH/jw

CC: David B. McWhorter

COMMERCIAL TESTING & ENGINEERING CO.



AUG 6 1980

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO ILLINOIS 60601

AREA CODE 312 726-8434



Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

August 5, 1980

Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

Re: IAD #97-E858-032-10
(formerly E733-032-10)
Purchase Order #M26144
Release #R26675

UPDATED ANALYTICAL REPORT

The ten samples identified IAD #97-E733-032-10, for which the original report was sent from our office on July 24, 1980, were logged in again for dissolved metals analyses on July 31, 1980 as per our telephone conversation of July 29, 1980. Our identification for these analyses is IAD #97-E858-032-10.

The samples were filtered and analyzed for dissolved Iron, Manganese, and Zinc by flame atomic absorption spectrophotometry. The results of these analyses are presented in Table No. I below and are reported in milligrams per liter (mg/l).

Table No. I
concentration in mg/l

<u>Sample</u>	<u>Iron, dissolved</u>	<u>Manganese, dissolved</u>	<u>Zinc, dissolved</u>
CF&I River Near AL-1-1 6:00 p.m. 7/2/80	≤0.02	≤0.009	≤0.02
CF&I AL-1-1 6:00 p.m. 7/2/80	≤0.02	0.380	≤0.01
CF&I River Near AL-2-1 7/12/80	≤0.02	≤0.009	≤0.01
CF&I AL-2-1 7/2/80	≤0.02	0.183	0.13
CF&I AL-3-3 7/2/80 4:30 p.m.	≤0.02	2.06	≤0.01
CF&I River Near AL-3-3 7/2/80 4:30 p.m.	≤0.02	0.064	0.04

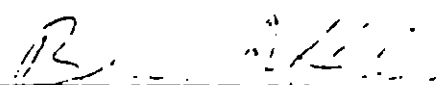


August 5, 1980

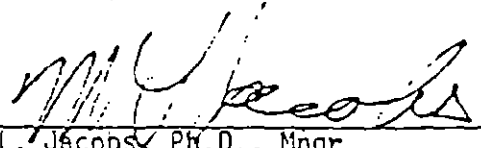
Table No. 1 (cont.)
concentration in mg/l

<u>Sample</u>	<u>Iron, dissolved</u>	<u>Mangarese, dissolved</u>	<u>Zinc, dissolved</u>
CF&I AL-4-2 7/2/80 3:00 p.m.	≤ 0.02	0.220	≤ 0.01
LA-218A 7/3/80 4:00 p.m.	0.02	≤ 0.009	≤ 0.01
Well 221 A 7/2/80	0.03	≤ 0.009	0.03
LA-264 7/3/80 11:10 a.m.	≤ 0.02	≤ 0.009	≤ 0.01

If there are any questions concerning these analyses, please call.



Bruce Hale
Section Supervisor



M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

BH/jw

CC: Dave McWhorter



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 726-8434



Reply to
Instrumental Analysis Division
90 Orchard Street
Golden, CO 80401

January 9, 1980

Phone: 303-278-9521

Mr. Jack Gillespie
CF&I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-0690-032-09
Release No. R 26649
Purchase Order No. M 26144

Analytical Report

Nine water samples were received for analyses on December 17, 1979.
The samples were given our identification IAD #97-0690-032-09.

The samples were analyzed for calcium, magnesium, and zinc by flame atomic absorption, for selenium by hydride generation atomic absorption, and for potassium and sodium by flame atomic emission.

Bicarbonate, carbonate, sulfate, pH value, specific conductance, and total dissolved solids were determined by the procedures of Standard Methods, 14th edition. Chloride and fluoride were determined by selective ion electrode methods. Boron was determined colorimetrically. Ion balance and sodium absorption ratio were calculated.

The results of these analyses are presented in the following tables and are reported in mg/l unless otherwise indicated.



Table No. 1
Concentration in mg/l

<u>Parameter</u>	<u>Allen Mine</u>		
	<u>Above</u> <u>12/14/79</u>	<u>Discharge</u> <u>12/13/79</u>	<u>Below</u> <u>12/14/79</u>
Boron	0.056	0.091	0.078
Calcium	65	9	58
Magnesium	14	3	12
Potassium	1.5	4.4	3.4
Selenium	<u><0.001</u>	<u><0.001</u>	<u><0.001</u>
Sodium	13	310	32
Zinc	<u><0.01</u>	<u><0.01</u>	<u><0.01</u>
Alkalinity, total	179	569	198
Bicarbonate	219	694	242
Carbonate	0	0	0
Chloride	2.0	4.0	3.0
Fluoride	0.3	0.2	0.3
Hardness (EDTA)	212	35	176
Sulfate	76	170	70
pH value	8.2	8.1	8.2
Dissolved Solids	242	836	258
Specific			
Conductance, μ mhos/cm	595	1250	616
Sodium Absorption			
Ratio	0.4	23	1.0
Ion Balance	1.3	2.3	0.9



Table No. 2
Concentration in mg/l

<u>Parameter</u>	<u>Maxwell Mine</u>		
	<u>Above</u> <u>12/14/79</u>	<u>Discharge</u> <u>12/13/79</u>	<u>Below</u> <u>12/14/79</u>
Boron	0.060	0.174	0.094
Calcium	60	35	59
Magnesium	12	3	12
Potassium	1.9	8.7	1.3
Selenium	≤0.001	≤0.001	≤0.001
Sodium	19	330	19
Zinc	≤0.01	≤0.01	≤0.01
Alkalinity, total	189	715	191
Bicarbonate	230	872	233
Carbonate	0	0	0
Chloride	2.8	120	2.4
Fluoride	0.4	0.5	0.3
Hardness (EDTA)	187	80	135
Sulfate	60	19	56
pH value	8.2	8.0	8.2
Dissolved Solids	282	974	294
Specific			
Conductance, μmhos/cm	570	1480	574
Sodium Absorption			
Ratio	0.6	14	0.6
Ion Balance	1.4	4.0	1.5



Table No. 3
Concentration in mg/l

<u>Parameter</u>	<u>Allen Dump</u>		<u>Water Table</u> <u>12/20/79</u>
	<u>Above</u> <u>12/14/79</u>	<u>Below</u> <u>12/14/79</u>	
Boron	0.026	0.134	0.091
Calcium	62	62	46
Magnesium	13	13	10
Potassium	1.2	13	1.2
Selenium	≤0.001	≤0.001	≤0.001
Sodium	13	10	6.1
Zinc	≤0.01	≤0.01	≤0.01
Alkalinity, total	175	172	134
Bicarbonate	213	210	164
Carbonate	0	0	0
Chloride	1.9	1.8	2.9
Fluoride	0.3	0.3	0.2
Hardness (EDTA)	210	201	152
Sulfate	64	70	52
pH value	8.1	8.1	7.2
Dissolved Solids	252	288	250
Specific			
Conductance, umhos/cm	563	570	477
Sodium Absorption			
Ratio	0.4	0.3	0.2
Ion Balance	0.8	0.2	2.7

If you have any questions concerning these analyses, please call.

Ernest Appelkians
Ernest Appelkians, Analyst

M. L. Jacobs
M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

EA/bd

COMMERCIAL TESTING & ENGINEERING CO.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES, 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 756-8424



Reply to

Instrumental Analysis Division

490 Orchard Street

Golden, CO 80401

Phone: 303-278-9521

January 9, 1980

Mr. Jack Gillespie
CF & I Steel Corp.
P.O. Box 316
Pueblo, Co. 81002

RE: IAD #97-0690-032-09
Release No. R26649
Purchase Order No. M26144

Analytical Report

Nine water samples were received for analyses on December 17, 1979.
The samples were given our identification IAD #97-0690-032-09.

The samples were analyzed for total zinc by flame atomic absorption spectrophotometry.

The results of these analyses are presented in Table No. 1 and are reported in mg/l.

See Report of 2/14/80

<u>Sample</u>	<u>Zinc, total, mg/l</u>
<u>Allen Mine</u>	
Above 12/14/79	0.30
Discharge 12/13/79	0.70
Below 12/14/79	0.77
<u>Maxwell Mine</u>	
Above 12/14/79	0.10
Discharge 12/13/79	0.07
Below 12/14/79	0.62
<u>Allen Dump</u>	
Above 12/14/79	0.37
Below 12/14/79	0.77
<u>Water Table 12/20/79</u>	0.36

If you have any questions concerning these analyses, please call.

Ernest Appelkang
Ernest Appelkang, Analyst

M. L. Jacobs
M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.



EA/as

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES, 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 - AREA CODE 312 726-8434



Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

January 28, 1980

Phone: 303-278-9521

Mr. Jack Gillespie
CF&I Steel Corporation
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-0690-032-09
Release No.: R26649
Purchase Order No.: M26144

ANALYTICAL REPORT

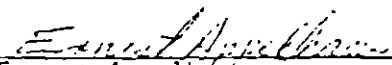
At your request, the nine water samples were additionally analyzed for total iron and total manganese. The analyses were done by flame atomic absorption spectrophotometry.

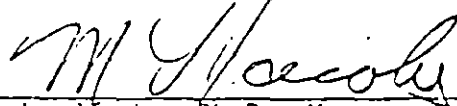
The results of these analyses are presented in Table No. 1 and are reported in mg/l.

Table No. 1
Concentration in mg/l

<u>Sample</u>	<u>Iron, total</u>	<u>Manganese, total</u>
<u>Allen Mine</u>		
Above 12/14/79	0.14	0.02
Discharge 12/13/79	0.06	<0.01
Below 12/14/79	0.17	0.04
<u>Maxwell Mine</u>		
Above 12/14/79	0.11	0.02
Discharge 12/13/79	1.08	0.02
Below 12/14/79	0.13	0.02
<u>Allen Dump</u>		
Above 12/14/79	0.03	0.01
Below 12/14/79	0.21	0.02
<u>Water Table 12/20/79</u>	1.89	0.29

If you have any questions concerning these analyses, please call.


Ernest Appelhaus
Section Supervisor


M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.



EA/ams

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 726-8434



Reply to

Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

February 14, 1980

Mr. Jack Gillespie
CF&I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-D690-032-09
Release No. R 26649
Purchase Order No. M 26144

ANALYTICAL REPORT

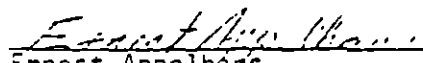
This report is to replace that of January 9, 1980. The nine water samples were re-analyzed for zinc by atomic absorption three more times with separate sample preparations each time.

The best analytical value for each sample is presented in Table No. 1 and is reported in mg/l.

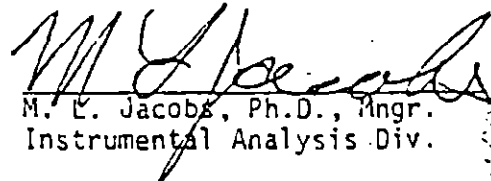
Table No. 1

<u>Sample</u>	<u>Zinc, total, mg/l</u>
<u>Allen Mine</u>	
Above 12/14/79	<0.01
Discharge 12/13/79	<0.01
Below 12/14/79	<0.01
<u>Maxwell Mine</u>	
Above 12/14/79	0.02
Discharge 12/13/79	0.03
Below 12/14/79	0.03
<u>Allen Dump</u>	
Above 12/14/79	<0.01
Below 12/14/79	<0.01
<u>Water Table 12/20/79</u>	0.01

If you have any questions concerning these analyses, please call.


Ernest Appelhaus
Section Supervisor

EA/bd


M. E. Jacobs, Ph.D., Mgr.
Instrumental Analysis Div.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 728-8434



Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

February 19, 1980

Mr. Jack Gillespie
CF & I Steel Corporation
P.O. Box 316
Pueblo, CO 81002

Re: IAD #97-D826-032-09
Release #R26658
Purchase Order #M26144

Analytical Report

Nine water samples were received for analyses on January 17, 1980. The samples were given our identification IAD #97-D826-032-09.

The samples were analyzed for calcium, iron, magnesium, manganese, and zinc by flame atomic absorption, for selenium by hydride generation atomic absorption, and for sodium and potassium by flame atomic emission spectrophotometry.

The samples were analyzed for alkalinity, bicarbonate, carbonate, hardness, specific conductance, sulfate, pH value, dissolved solids, and suspended solids by the procedures of Standard Methods, 14th edition. Chloride and fluoride were determined by selective ion electrode methods, and boron colorimetrically. Sodium absorption ratio and the ion balance were calculated.

The results of these analyses are presented in the following tables and are reported in mg/l unless otherwise indicated.

Table No. 1
Concentration in mg/l

<u>Parameter</u>	<u>Allen Mine - 1/16/80</u>		
	<u>Above</u>	<u>Discharge</u>	<u>Below</u>
Boron	<0.010	<0.010	<0.010
Calcium	52	10	53
Iron, total	0.22	0.18	0.21
Magnesium	10	2.9	11
Manganese, total	0.03	<0.01	0.03



Table No. 1 (Cont.)
Concentration in mg/l

<u>Parameter</u>	<u>Allen Mine - 1/16/80</u>		
	<u>Above</u>	<u>Discharge</u>	<u>Below</u>
Potassium	1.1	4.8	1.1
Sodium	8.8	280	11
Alkalinity, as CaCO_3	145	521	150
Bicarbonate, HCO_3	177	619	183
Carbonate, CO_3	0	8	0
Chloride	3.7	6.0	1.8
Fluoride	0.2	1.2	0.2
Hardness, (EDTA), as CaCO_3	153	31	167
Sulfate	50	145	55
pH value	8.1	8.4	8.2
Specific Conductance, $\mu\text{mhos/cm}$	511	1270	527
Dissolved Solids	240	850	236
Suspended Solids	8	4	2
Sodium Absorption Ratio	0.3	20.1	0.4
Ion Balance	1.4	2.0	0.9

Table No. 2
Concentration in mg/l

<u>Parameter</u>	<u>Maxwell Mine - 1/16/80</u>		
	<u>East of Mine</u>	<u>Discharge</u>	<u>West of Culvert</u>
Boron	≤ 0.010	0.055	≤ 0.010
Calcium	51	81	53
Iron, total	1.41	7.12	7.23
Magnesium	10	11	10
Manganese, total	0.05	0.08	0.14
Potassium	1.5	70	2.2
Sodium	13	340	13
Alkalinity, as CaCO_3	155	750	159
Bicarbonate, HCO_3	188	913	194
Carbonate, CO_3	0	0	0
Chloride	1.6	110	1.6
Fluoride	0.3	3.8	0.2
Hardness (EDTA), as CaCO_3	161	239	152



Table No. 2 (Cont.)
Concentration in mg/l

<u>Parameter</u>	<u>Maxwell Mine - 1/16/80</u>		
	<u>East of Mine</u>	<u>Discharge</u>	<u>West of Culvert</u>
Sulfate	45	143	49
pH value	8.1	7.2	8.2
Specific Conductance, μmhos/cm	529	1850	529
Dissolved Solids	306	1740	300
Suspended Solids	61	1140	200
Sodium Absorption Ratio	0.4	9.4	0.4
Ion Balance	0.6	-0.6	1.0

Table No. 3
Concentration in mg/l

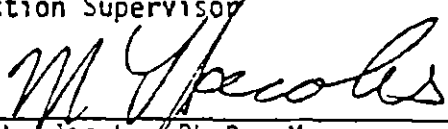
<u>Parameter</u>	<u>Allen Dump - 1/16/80</u>	
	<u>Above</u>	<u>Below</u>
Boron	≤0.010	≤0.010
Calcium	54	55
Iron, total	0.20	0.21
Magnesium	10	10
Manganese, total	0.02	0.02
Potassium	1.2	1.2
Selenium	≤0.002	≤0.002
Sodium	8.8	9.0
Alkalinity, as CaCO ₃	146	148
Bicarbonate, HCO ₃	178	180
Carbonate, CO ₃	0	0
Chloride	1.8	2.1
Fluoride	0.3	0.2
Hardness (EDTA), as CaCO ₃	165	157
Sulfate	50	51
pH value	8.2	8.2
Specific Conductance, μmhos/cm	514	513
Dissolved Solids	224	220
Suspended Solids	3	3
Sodium Absorption Ratio	0.3	0.3
Ion Balance	0.6	0.5



February 20, 1980

If you have any questions concerning these analyses, please call.


Ernest Appelhans
Section Supervisor


M. L. Jacobs Ph.D., Mngr.
Instrumental Analysis Div.

EA/jw



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



Reply to

Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

February 20, 1980

Phone: 303-278-9521

Mr. Jack Gillespie
CF & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-0826-032-09
Release No. R26658
Purchase Order No. M26144

Analytical Report

Nine water samples were received for analyses on January 17, 1980. The samples were given our identification IAD #97-0826-032-09.

The samples were analyzed for dissolved and total zinc by flame atomic absorption spectrophotometry.

The results of these analyses are presented in Table No. 1 and are reported in mg/l.

Table No. 1

<u>Sample</u>	<u>Zinc, mg/l</u>	
	<u>Dissolved</u>	<u>Total</u>
<u>Allen Mine - 1/16/80</u>		
Above	<0.01	0.02
Discharge	<0.01	0.03
Below	<0.01	0.01
<u>Maxwell Mine - 1/16/80</u>		
East of Mine	<0.01	0.05
Discharge	0.07	0.10
East side of Culvert	<0.01	0.03
West side of Culvert	<0.01	0.03
<u>Allen Mine - 1/16/80</u>		
Above	<0.01	0.02
Below	<0.01	0.01

If you have any questions concerning these analyses, please call.

Ernest Appellans
Ernest Appellans
Section Supervisor

M. L. Jacobs
M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.



EA/ams

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 728-8434



Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

March 21, 1980

MINING DEPARTMENT

Mr. Jack Gillespie
CF&I Steel Corporation
P.O. Box 316
Pueblo, Colorado 81002

MAR 24 1980

RE: IAD #97-E001-032-12
Release No. R26663
Purchase Order No. M26144

ANALYTICAL REPORT

Four water samples were received for analyses on February 21, 1980. The samples were given our identification IAD #97-E001-032-12.

The samples were analyzed for zinc by flame atomic absorption, and for suspended solids by the procedures of Standard Methods, 14th edition.

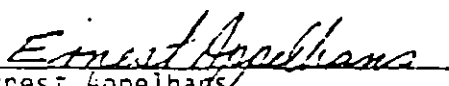
The results of these analyses are presented in Table No. 1 and are reported in mg/l.

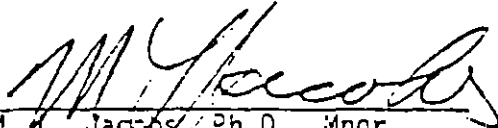
Table No. 1

Concentration in mg/l

<u>Depth Integrated Samples</u>	<u>Suspended Solids</u>	<u>Zinc, total</u>
West of Allen - 2/20/80	57	0.012
Below Allen - 2/20/80	48	0.003
Maxwell Down Stream	32	<0.002
Maxwell Upstream	48	<0.002

If you have any questions concerning these analyses, please call.


Ernest Appelhaus
Section Supervisor


M. L. Jacobs, Ph.D., Mgr.
Instrumental Analysis Div.

EA/ams



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

March 21, 1980

Phone: 303-278-9521

MINING DEPARTMENT

Mr. Jack Gillespie
CF&I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

MAR 24 1980

RE: IAD #97-E001-032-12
Release No. R 26663
Purchase Order No. M 26144

ANALYTICAL REPORT

Seven water samples were received for analyses on February 21, 1980. The samples were given our identification IAD #97-E001-032-12.

The samples were analyzed for calcium, iron, magnesium, manganese, and zinc by flame atomic absorption, for sodium and potassium by flame atomic emission, and for selenium by hydride generation atomic absorption.

Boron was determined colorimetrically. Alkalinity, chloride, fluoride, hardness, pH, sulfate, specific conductance, suspended solids, oil and grease, and dissolved solids were determined by the procedures of Standard Methods, 14th edition. Ion balance and sodium absorption ratio were calculated.

The results of these analyses are presented in Table No. 1 and are reported in mg/l unless otherwise indicated.



Table No. 1
Concentration in mg/l

<u>Parameter</u>	<u>West of Allen</u>	<u>Allen Discharge</u>	<u>Below Allen</u>
Calcium	58	9.3	57
Iron, total	0.17	0.03	0.16
Magnesium	15	5.4	14
Manganese, total	0.02	≤0.01	0.08
Potassium	2.3	4.8	2.4
Selenium	≤0.003	≤0.003	≤0.003
Sodium	14	279	19
Zinc, total	≤0.002	≤0.002	0.014
Boron	0.047	≤0.013	≤0.013
Alkalinity, as CaCO ₃	143	520	158
Bicarbonate, HCO ₃	175	634	192
Carbonate, CO ₃	0	0	0
Chloride	3.4	6.6	3.9
Fluoride	0.1	0.8	0.2
Hardness, EDTA, as CaCO ₃	192	41	181
pH value	7.9	8.1	3.2
Sulfate	83	147	74
Specific Conductance, umhos/cm	480	1200	430
Dissolved Solids	264	720	196
Suspended Solids	3	≤1	5
Oil and Grease		9	
Sodium Absorption Ratio	0.4	18.1	0.6
Ion Balance	-0.5	1.6	-0.4



Table No. 2
Concentration in mg/l

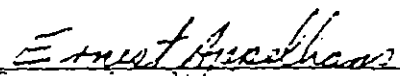
<u>Parameter</u>	<u>Allen Dump</u>	
	<u>Above</u>	<u>Below</u>
Calcium	58	57
Iron, total	0.12	0.13
Magnesium	15	15
Manganese, total	0.02	0.02
Potassium	2.3	2.1
Selenium	≤0.003	≤0.003
Sodium	15	15
Zinc, total	≤0.002	≤0.002
Boron	≤0.013	≤0.013
Alkalinity, as CaCO ₃	141	164
Bicarbonate, HCO ₃	171	199
Carbonate, CO ₃	0	0
Chloride	3.6	4.2
Fluoride	0.2	0.2
Hardness, EDTA, as CaCO ₃	191	194
pH value	3.2	3.2
Sulfate	37	79
Specific Conductance, umhos/cm	470	400
Dissolved Solids	276	208
Suspended Solids	6	1
Sodium Absorption Ratio	0.5	0.5
Ion Balance	-0.6	1.4

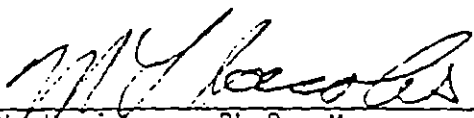


Table No. 3
Concentration in mg/l

Parameter	Maxwell Mine	
	Upstream	Downstream
Calcium	53	54
Iron, total	0.33	0.29
Magnesium	12	12
Manganese, total	0.03	0.04
Potassium	1.9	2.1
Selenium	≤0.003	≤0.003
Sodium	17	17
Zinc, total	0.005	≤0.002
Boron	0.020	≤0.013
Alkalinity, as CaCO ₃	164	162
Bicarbonate, HCO ₃	200	198
Carbonate, CO ₃	0	0
Chloride	3.9	3.4
Fluoride	0.4	0.2
Hardness, EDTA, as CaCO ₃	161	163
pH value	8.3	8.2
Sulfate	55	54
Specific Conductance, umhos/cm	420	440
Dissolved Solids	196	380
Suspended Solids	47	8
Sodium Absorption Ratio	0.5	0.5
Ion Balance	0.3	0.1

If you have any questions concerning these analyses, please call.


Ernest Appelhaus
Section Supervisor


W. E. Jacobs, Ph.D., Mgr.
Instrumental Analysis Div.

EA/bnd



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES 228 NORTH LA SALLE STREET CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



Reply to

Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

March 21, 1980

Phone: 303-278-9521

Mr. Jack Gillespie
CF&I Steel Corporation
P.O. Box 316
Pueblo, Colorado 81002

RE: IAD #97-E001-032-12
Release No. R26663
Purchase Order No. M26144

ANALYTICAL REPORT

One water sample was received for analyses on February 21, 1980. The sample was given our identification IAD #97-E001-032-12.

The sample was analyzed for calcium, iron, magnesium, manganese, and zinc by flame atomic absorption, for sodium and potassium by flame atomic emission, and for selenium by hydride generation atomic absorption.

Boron was determined colorimetrically. Alkalinity, chloride, fluoride, hardness, pH, sulfate, specific conductance, suspended solids, oil and grease, and dissolved solids were determined by the procedures of Standard Methods, 14th edition. Ion balance and sodium absorption ratio were calculated.

The results of these analyses are presented in Table No. 1 and are reported in mg/l unless otherwise indicated.

Table No. 1
Concentration in mg/l

<u>Parameter</u>	<u>Maxwell Mine Discharge at Return Shaft</u>
Calcium	496
Iron, total	3.03
Magnesium	11
Manganese, total	0.03



Table No. 1 (con't)
Concentration in mg/l

<u>Parameter</u>	<u>Maxwell Mine Discharge at Return Shaft</u>
Potassium	38
Selenium	≤0.003
Sodium	365
Zinc, total	0.032
Boron	0.127
Alkalinity, as CaCO ₃	600
Bicarbonate, HCO ₃	731
Carbonate, CO ₃	0
Chloride	1030
Fluoride	3.7
Hardness, EDTA, as CaCO ₃	1550
pH value	6.9
Sulfate	32
Specific Conductance, μmhos/cm	4200
Dissolved Solids	2670
Suspended Solids	477
Oil and Grease	7
Sodium Absorption Ratio	4.4
Ion Balance	-0.3

If you have any questions concerning these analyses, please call.

Ernest Appelhaus
Ernest Appelhaus
Section Supervisor

M. L. Jacobs
M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

EA/ams



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 - AREA CODE 312 726-8434

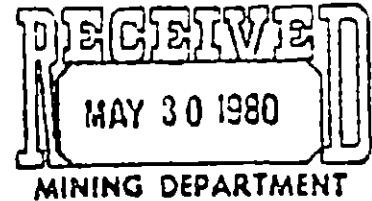


Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

May 28, 1980

Phone: 303-278-9521

Mr. Jack Gillespie
CF&I Steel Corp.
P.O. Box 316
Pueblo, CO 81002



RE: IAD #97-E385-032-03
Release No. R 26667
Purchase Order No. M 26144

ANALYTICAL REPORT

Three water samples were received for analyses on April 28, 1980. These samples were given our identification IAD #97-E385-032-03. The first of these samples was taken on April 23, 1980 and is reported separately from the second and third samples which were taken the following day.

The samples were analyzed for iron, manganese, calcium, magnesium, sodium, and potassium by flame atomic absorption, and for selenium by hydride generation atomic absorption.

Boron was determined colorimetrically. Alkalinity, chloride, fluoride, hardness, pH, sulfate, specific conductance, suspended solids, dissolved solids, and oil & grease were determined by the procedures of Standard Methods, 14th edition. Ion balance and sodium absorption ratio were calculated.

The results of these analyses are presented in the following tables and are reported in mg/l unless otherwise indicated.



Table No. II

Parameter	Allen Mine Discharge West Portal Manway 1:20 P.M. 4/24/80	Maxwell Mine Discharge 1:44 P.M. 4/24/80
pH Value	8.52	8.51
Specific Conductance, μ mhos/cm	1400	900
Suspended Solids, mg/l	66	1520
Dissolved Solids, mg/l	934	960
Iron, total, mg/l	1.3	16.3
Manganese, total, mg/l	0.026	0.146
Boron, total, mg/l	0.002	0.001
Selenium, total, mg/l	0.030	0.011
Oil & Grease, mg/l	≤ 4	≤ 4
Sulfate, mg/l	172	36
Hardness, mg/l	3	86
Alkalinity (as CaCO_3), mg/l	512	395
Calcium, mg/l	7.2	7.3
Magnesium, mg/l	2.2	183
Sodium, mg/l	298	2.3
Potassium, mg/l	4.7	9.7
Bicarbonate, mg/l	604	463
Carbonate, mg/l	10	9
Chloride, mg/l	5.7	30.2
Fluoride, mg/l	0.73	2.6
Sodium Absorption Ratio	25	15
Ion Balance	1.0	0.5



If there are any questions concerning these analyses, please call.

Bruce Hale
Bruce Hale
Section Supervisor

M. L. Jacobs by R. L. Jacobs 05/22/80
M. L. Jacobs, Ph.D., Mgr.
Instrumental Analysis Div.

BH/bnd

COMMERCIAL TESTING & ENGINEERING CO.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 721-8434



Reply to

Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

August 6, 1980

Mr. Jack Gillespie
CF & I Steel Corporation
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-E747-032-05
Release #R26675
Purchase Order #M26144



Analytical Report

Five water samples were received for analyses on July 9, 1980. These samples were given our identification IAD #97-E747-032-05.

The samples were analyzed for total Iron, Zinc, Manganese and dissolved Calcium, Magnesium, Iron, Zinc and Manganese by flame atomic absorption. The dissolved Sodium and Potassium were analyzed by flame emission. Total Selenium was analyzed by hydride generation atomic absorption. Samples for total metals were first digested in nitric and hydrochloric acids.

Boron was determined colorimetrically, Sulfate turbidimetrically, Chloride and Fluoride by specific ion electrode by the procedures of EPA Methods for Chemical Analysis of Water and Waste, 1979. Dissolved solids (TDS), Suspended Solids (TSS) and oil and grease were determined gravimetrically by the procedures of Standard Methods, 14th edition. pH, Carbonate, Bicarbonate, Alkalinity and Specific Conductance were all done by Standard Method's Procedures. Hardness, Sodium Absorption Ratio, and Ion Balance were calculated.

The results of these analyses are presented in the following tables and are reported in milligrams per litre (mg/l) unless otherwise noted.



Table No. I
(mg/l)

<u>Parameter</u>	<u>Allen Mine Discharge 7/7/80 57°F 12:20 PM</u>	<u>Purgatory Above Allen 7/7/80 57°F 11:50 AM</u>	<u>Purgatory Below Allen 7/7/80 59°F 12:15 PM</u>
Sodium, dissolved	234	4.17	2.9
Calcium, dissolved	15.0	32.2	31.4
Magnesium, dissolved	4.6	4.5	4.6
Potassium, dissolved	4.57	0.95	0.95
Iron, total	0.10	0.43	0.41
Iron, dissolved	≤0.02	≤0.02	≤0.02
Zinc, total	0.05	≤0.01	≤0.01
Zinc, dissolved	0.03	≤0.01	≤0.01
Manganese, total	≤0.009	0.018	0.022
Manganese, dissolved	≤0.009	≤0.009	≤0.009
Selenium, total	0.011	0.002	≤0.002
Boron, total	0.09	0.04	0.03
Alkalinity (as CaCO ₃)	434	62.8	84.9
Bicarbonate	528	101	103
Carbonate	0	0	0
Chloride	7.1	2.30	2.40
Fluoride	3.48	0.64	0.51
pH	8.0	7.9	8.0
Sulfate	158	11.7	11.1
Conductivity (μmhos/cm)	100	170	190
Total dissolved solids	807	135	103
Total suspended solids	4	21	16
Oil and grease	5	2	4
Hardness (as CaCO ₃)	56.4	98.9	97.3
Sodium Absorption Ratio	13.6	0.2	0.1
Ion Balance	3.0	-1.2	-0.6

COMMERCIAL TESTING & ENGINEERING CO.



August 5, 1980

Table No. II
(mg/l)

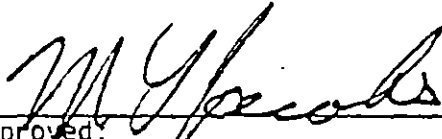
Parameter	Purgatory Below Maxwell 7/7/80 1:35 PM 60°F	Purgatory Above Maxwell 7/7/80 60°F 1:20 PM
Sodium, dissolved	2.9	3.2
Calcium, dissolved	33.9	34.8
Magnesium, dissolved	5.3	5.3
Potassium, dissolved	0.95	0.87
Iron, total	0.78	0.63
Iron, dissolved	<0.02	<0.02
Zinc, total	<0.01	<0.01
Zinc, dissolved	<0.02	<0.01
Manganese, total	0.040	0.022
Manganese, dissolved	<0.009	<0.009
Selenium, total	<0.002	<0.002
Boron, total	<0.02	<0.02
Alkalinity (as CaCO ₃)	100	101
Bicarbonate	117	124
Carbonate	0	0
Chloride	2.49	2.10
Fluoride	0.53	0.51
pH	8.0	8.0
Sulfate	9.4	10.6
Conductivity (umhos/cm)	180	180
Total dissolved solids	125	127
Total suspended solids	34	30
Oil and grease	2	4
Hardness (as CaCO ₃)	106	109
Sodium absorption ratio	0.1	0.1
Ion balance	-0.5	0



August 5, 1980

If you have any questions concerning these analyses, please call.


Bruce Hale
Section Supervisor


Approved:
M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis

BH/ja

cc: David McWhorter

COMMERCIAL TESTING & ENGINEERING CO.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



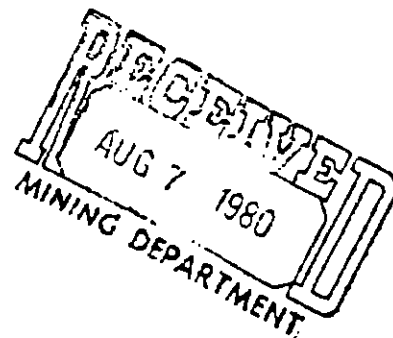
Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

August 5, 1980

Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

Re: IAD #97-E858-032-10
(formerly E733-032-10)
Purchase Order #M26144
Release #R26675



UPDATED ANALYTICAL REPORT

The ten samples identified IAD #97-E733-032-10, for which the original report was sent from our office on July 24, 1980, were logged in again for dissolved metals analyses on July 31, 1980 as per our telephone conversation of July 29, 1980. Our identification for these analyses is IAD #97-E858-032-10.

The samples were filtered and analyzed for dissolved Iron, Manganese, and Zinc by flame atomic absorption spectrophotometry. The results of these analyses are presented in Table No. I below and are reported in milligrams per liter (mg/l).

Table No. I
concentration in mg/l

<u>Sample</u>	<u>Iron, dissolved</u>	<u>Manganese, dissolved</u>	<u>Zinc, dissolved</u>
CF&I River Near AL-1-1 6:00 p.m. 7/2/80	≤0.02	≤0.009	≤0.02
CF&I AL-1-1 6:00 p.m. 7/2/80	≤0.02	0.380	≤0.01
CF&I River Near AL-2-1 7/12/80	≤0.02	≤0.009	≤0.01
CF&I AL-2-1 7/2/80	≤0.02	0.183	0.13
CF&I AL-3-3 7/2/80 4:30 p.m.	≤0.02	2.06	≤0.01
CF&I River Near AL-3-3 7/2/80 4:30 p.m.	≤0.02	0.064	0.04

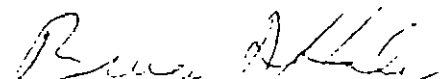


August 5, 1980

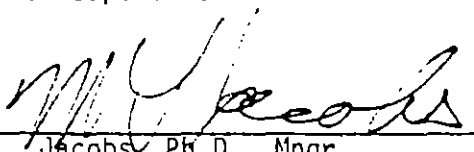
Table No. I (cont.)
concentration in mg/l

<u>Sample</u>	<u>Iron, dissolved</u>	<u>Manganese, dissolved</u>	<u>Zinc, dissolved</u>
CF&I AL-4-2 7/2/80 3:00 p.m.	≤0.02	0.220	≤0.01
LA-218A 7/3/80 4:00 p.m.	0.02	≤0.009	≤0.01
Well 221 A 7/2/80	0.03	≤0.009	0.03
LA-264 7/3/80 11:10 a.m.	≤0.02	≤0.009	≤0.01

If there are any questions concerning these analyses, please call.



Bruce Hale
Section Supervisor



M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

BH/jw

CC: Dave McWhorter



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 726-8434



Reply to

Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

August 6, 1980

Mr. Jack Gillespie
CF & I Steel Corporation
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-E747-032-05
Release #R26675
Purchase Order #M26144



Analytical Report

Five water samples were received for analyses on July 9, 1980.
These samples were given our identification IAD #97-E747-032-05.

The samples were analyzed for total Iron, Zinc, Manganese and dissolved Calcium, Magnesium, Iron, Zinc and Manganese by flame atomic absorption. The dissolved Sodium and Potassium were analyzed by flame emission. Total Selenium was analyzed by hydride generation atomic absorption. Samples for total metals were first digested in nitric and hydrochloric acids.

Boron was determined colorimetrically, Sulfate turbidimetrically, Chloride and Fluoride by specific ion electrode by the procedures of EPA Methods for Chemical Analysis of Water and Waste, 1979. Dissolved solids (TDS), Suspended Solids (TSS) and oil and grease were determined gravimetrically by the procedures of Standard Methods, 14th edition. pH, Carbonate, Bicarbonate, Alkalinity and Specific Conductance were all done by Standard Method's Procedures. Hardness, Sodium Absorption Ratio, and Ion Balance were calculated.

The results of these analyses are presented in the following tables and are reported in milligrams per litre (mg/l) unless otherwise noted.



August 5, 1980

Table No. I
(mg/l)

Parameter	Allen Mine	Purgatory	Purgatory
	Discharge 7/7/80 57°F 12:20 PM	Above Allen 7/7/80 57°F 11:50 AM	Below Allen 7/7/80 59°F 12:15 PM
Sodium, dissolved	234	4.17	2.9
Calcium, dissolved	15.0	32.2	31.4
Magnesium, dissolved	4.6	4.5	4.6
Potassium, dissolved	4.57	0.95	0.95
Iron, total	0.10	0.43	0.41
Iron, dissolved	≤0.02	≤0.02	≤0.02
Zinc, total	0.05	≤0.01	≤0.01
Zinc, dissolved	0.03	≤0.01	≤0.01
Manganese, total	≤0.009	0.018	0.022
Manganese, dissolved	≤0.009	≤0.009	≤0.009
Selenium, total	0.011	0.002	≤0.002
Boron, total	0.09	0.04	0.03
Alkalinity (as CaCO ₃)	434	62.8	84.9
Bicarbonate	528	101	103
Carbonate	0	0	0
Chloride	7.1	2.30	2.40
Fluoride	3.48	0.64	0.51
pH	8.0	7.9	8.0
Sulfate	158	11.7	11.1
Conductivity (μmhos/cm)	100	170	190
Total dissolved solids	807	135	103
Total suspended solids	4	21	16
Oil and grease	5	2	4
Hardness (as CaCO ₃)	56.4	98.9	97.3
Sodium Absorption Ratio	13.6	0.2	0.1
Ion Balance	3.0	-1.2	-0.6



Table No. II
(mg/l)

5

Parameter	Purgatory Below Maxwell 7/7/80 1:35 PM 60°F	Purgatory Above Maxwell 7/7/80 60°F 1:20 PM
Sodium, dissolved	2.9	3.2
Calcium, dissolved	33.9	34.8
Magnesium, dissolved	5.3	5.3
Potassium, dissolved	0.95	0.87
Iron, total	0.78	0.63
Iron, dissolved	≤0.02	≤0.02
Zinc, total	≤0.01	≤0.01
Zinc, dissolved	≤0.02	≤0.01
Manganese, total	0.040	0.022
Manganese, dissolved	≤0.009	≤0.009
Selenium, total	≤0.002	≤0.002
Boron, total	≤0.02	≤0.02
Alkalinity (as CaCO ₃)	100	101
Bicarbonate	117	124
Carbonate	0	0
Chloride	2.49	2.10
Fluoride	0.53	0.51
pH	8.0	8.0
Sulfate	9.4	10.6
Conductivity (μmhos/cm)	180	180
Total dissolved solids	125	127
Total suspended solids	34	30
Oil and grease	2	4
Hardness (as CaCO ₃)	106	109
Sodium absorption ratio	0.1	0.1
Ion balance	-0.5	0

August 5, 1980

If you have any questions concerning these analyses, please call.



Bruce Hale
Section Supervisor



Approved:
M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis

BH/ja

cc: David McWhorter

COMMERCIAL TESTING & ENGINEERING CO.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES, 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



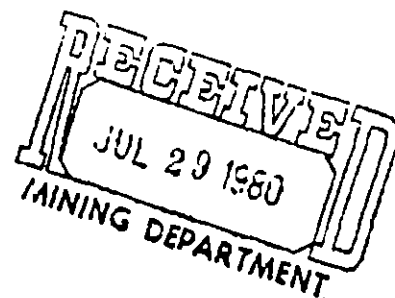
Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

July 24, 1980

Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

Re: IAD #97-E733-032-10
Release #R26675
Purchase Order #M26144



ANALYTICAL REPORT

Ten water samples were received for analyses on July 7, 1980. These samples were given our identification IAD #97-E733-032-10.

The samples were analyzed for total iron, manganese, zinc, magnesium, and calcium by flame atomic absorption for sodium and potassium by flame emission and for selenium by hydride generation atomic absorption.

Boron was determined colorimetrically, sulfate turbidimetrically, chloride and fluoride by specific ion electrode, and dissolved solids (TDS), suspended solids (TSS) and oil and grease (O & G) were determined gravimetrically by the procedures of Standard Methods, 14th edition. pH, carbonate, bicarbonate, alkalinity and specific conductance were all done by Standard Method's procedures. Hardness, sodium absorption ratio, and ion balance were calculated.

Note: Ion Balance calculations are made using dissolved alkali metal numbers (Mg, Ca, Na, and K) and neglecting the use of total heavy metals (Fe, Mn, and Zinc) since they may be assumed to be negligible in the dissolved sample. If the ion balance ratio is high it may be due to small amounts of dissolved heavy metals in the sample, not accounted for. Furthermore, in samples of high pH, alkalinity, relationship calculations may include amounts of hydroxide ion that, although not called for in the analysis, needs to be considered when balancing ions.

Hardness calculations are based on the amounts of dissolved calcium and magnesium in the samples. Again, if hardness numbers are low, it would be due to small amounts of dissolved heavy metals in the samples that are not accounted for. Hardness calculations should not be made including total metals since a digestion puts into solution additional amounts of suspended solids.

The results of these analyses are presented in the following tables and are reported in mg/l unless otherwise noted.



July 24, 1980

Table No. I
(mg/l)*Water level 7.33'*

Parameter	CF&I River Near AL-1-1 7/2/80, 6:00 PM	CF&I AL-1-1 7/2/80, 6:00 PM	CF&I River Near AL-2-1, 7/2/80
Calcium, dissolved	28.0	87.4	30.0
Sodium, dissolved	2.7	43.0	2.9
Magnesium, dissolved	4.2	13.1	4.2
Potassium, dissolved	1.12	2.5	1.3
Iron, total	0.88	205	0.88
Manganese, total	0.025	5.86	0.029
Zinc, total	≤0.009	0.913	≤0.009
Selenium, total	≤0.002	≤0.002	≤0.002
Boron, total	0.05	0.09	0.03
Alkalinity (as CaCO ₃)	72.5	186	70.4
Bicarbonate	88.3	227	85.8
Carbonate	0	0	0
Chloride	3.3	11.7	2.9
Fluoride	0.12	0.20	0.16
Hardness (as CaCO ₃)	87.2	468	92.2
pH	7.9	7.3	7.8
Sulfate	8.9	124	11.1
Conductivity (umhos/cm)	140	540	150
Total Dissolved Solids	169	602	121
Total Suspended Solids	17	4500	137
Oil & Grease	16	94	14
Sodium Absorption Ratio	0.1	1.1	0.1
Ion Balance	-1.2	-3.5	-2.0

COMMERCIAL TESTING & ENGINEERING CO.



July 24, 1980

Table No. II

(mg/l)

Parameter	<i>Water level 14.75'</i> CF&I AL-2-1 7/2/80	<i>w.l. 5.36'</i> CF&I AL-3-3 7/2/80, 4:30 PM	CF&I River Near AL-3-3 7/2/80, 4:30 PM	<i>w.l. 7.71'</i> CF&I AL-4-2 7/2/80, 3:00 PM
Calcium, dissolved	55.2	74.9	29.7	38.3
Sodium, dissolved	244	26.9	5.1	23.7
Magnesium, dissolved	13.2	15.6	4.8	7.6
Potassium, dissolved	6.5	2.5	0.9	1.1
Iron, total	65.0	50.1	22.8	0.49
Manganese, total	0.88	4.98	0.40	0.27
Zinc, total	1.64	0.349	0.080	≤0.009
Selenium, total	0.020	0.003	≤0.002	≤0.002
Boron, total	0.03	0.04	≤0.02	0.03
Alkalinity (as CaCO ₃)	522	275	93.2	143
Bicarbonate	636	336	114	174
Carbonate	0	0	0	0
Chloride	14.0	10.2	5.5	6.8
Fluoride	0.18	0.60	0.20	0.28
Hardness (as CaCO ₃)	192	251	93.9	127
pH	7.4	7.4	7.8	7.4
Sulfate	198	20.5	11.7	5.0
Conductivity (µmhos/cm)	1200	480	170	280
Total dissolved solids	951	404	219	223
Total suspended solids	1090	156	844	5
Oil & Grease	19	21	≤1	2
Sodium Absorption Ratio	7.7	0.7	0.2	0.9
Ion Balance	1.0	0	1.1	-2.8



July 25, 1980

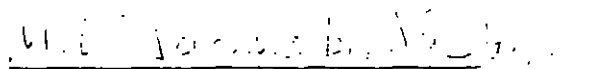
Table No. III

(mg/l)

Parameter	WL. 275.13' LA-218A 7/3/80, 4:00 PM	WL. 124.59' Well 221A 7/2/80	WL. 50.93' LA-264 11:10 AM 7/3/80
Calcium, dissolved	20.2	1.8	3.3
Sodium, dissolved	244	251	294
Magnesium, dissolved	≤0.2	0.7	1.4
Potassium, dissolved	3.1	2.1	2.3
Iron, total	117	25.9	0.27
Manganese, total	0.88	0.14	≤0.01
Zinc, total	1.14	1.66	0.042
Selenium, total	≤0.002	≤ 0.002	≤0.002
Boron, total	0.16	0.06	0.06
Alkalinity (as CaCO ₃)	579	596	615
Bicarbonate	0	606	749
Carbonate	225	59.6	0
Chloride	14.8	15.0	16.0
Fluoride	2.9	2.8	2.4
Hardness (as CaCO ₃)	50.4	7.4	14.0
pH	11.4	8.8	8.2
Sulfate	33.7	15.0	88
Conductivity (μmhos/cm)	1600	1000	1100
Total dissolved solids	891	775	846
Total suspended solids	6190	85	3
Oil & Grease	9	8	4
Hydroxide	70	-	-
Sodium Absorption Ratio	15	40	34
Ion Balance	3.9	5.5	4.7

If there are any questions concerning these analyses, please call.


 Bruce A. Hale
 Section Supervisor


 M. L. Jacobs, Ph.D., Mngr.
 Instrumental Analysis Div.

BH/jw

CC: David B. McWhorter

COMMERCIAL TESTING & ENGINEERING CO.



TC - 26680

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES 228 NORTH LA SALLE STREET, CHICAGO ILLINOIS 60601

AREA CODE 312 726-8434

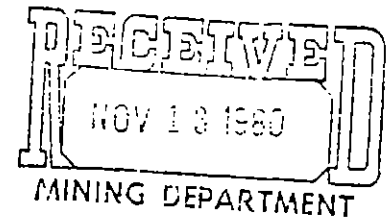


Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

November 11, 1980

Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 36
Pueblo, CO 81002



RE: IAD #97-F142-032-01

Analytical Report

One water sample was received for analyses on September 18, 1980.
This sample was given our identification IAD #97-F142-032-01.

The sample was analyzed for total Iron, Zinc and Manganese and dissolved Calcium, Magnesium, Iron, Zinc and Manganese by flame atomic absorption. The dissolved Sodium and Potassium were analyzed by flame emission. Total Selenium was analyzed by hydride generation atomic absorption. Samples for total metals were first digested in nitric and hydrochloric acids.

Boron was determined colorimetrically; Sulfate, turbidimetrically and Chloride and Fluoride by specific ion electrode using the procedures of EPA-Methods for Chemical Analysis of Water and Wastes, 1979. Dissolved solids (TDS) and Total Suspended Solids (TSS) were determined gravimetrically by the procedures of Standard Methods, 14th edition. pH, Carbonate, Bicarbonate, Alkalinity and Specific Conductance were all done by Standard Methods procedures. Sodium Absorption Ratio and Ion Balance were calculated.

The results of these analyses are presented in Table No. 1 and are reported in milligrams per litre (mg/l) except pH or otherwise noted.

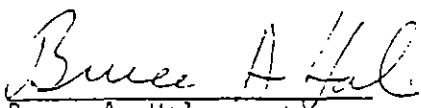


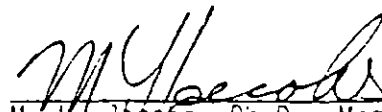
Table No. 1
(mg/l)

Parameter	Maxwell Mine Discharge	
	9/17/80	10:15 AM
Sodium (dissolved)		302
Calcium (dissolved)		1.9
Magnesium (dissolved)		1.10
Potassium (dissolved)		2.48
Iron (total)		40.7
Iron (dissolved)		<0.01
Zinc (total)		0.277
Zinc (dissolved)		<0.004
Manganese (total)		0.252
Manganese (dissolved)		<0.002
Selenium (total)		0.008
Boron (total)		0.25
Alkalinity (as CaCO ₃)		716
Bicarbonate		814
Carbonate		29
Chloride		52
Fluoride		6.40
pH		8.7
Sulfate		17
Conductivity (umhos/cm)		1200
TDS		1034
TSS		6520
Sodium Absorption Ratio		43.2
Ion Balance *		8.5

* Note: Ion Balance calculations are based on dissolved anions and cations. The sample shows an excess of anions or a cation (s) that is not being accounted for. The sample was rechecked for Sodium, Calcium and Bicarbonate since these are the major constituents in this water. A qualitative scan (X-ray fluorescence) gave inconclusive results on the dissolved constituents in the water. A scan will be run on the salts to determine if there is an additional cation not accounted for. This data will be forthcoming should any contradictions to the data herein arise.

If there are any questions concerning these results, please call.


Bruce A. Hale
Section Supervisor


M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

as

COMMERCIAL TESTING & ENGINEERING CO.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES, 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 726-8434



Reply to

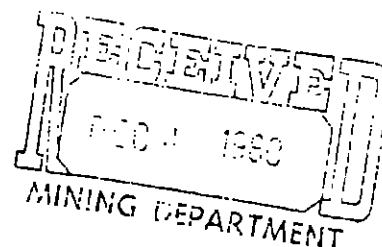
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

December 3, 1980

Mr. Jack Gillespie
CF & I Steel Corporation
P.O. Box 316
Pueblo, Colorado 81002

RE: IAD #97-F207-032-03
P.O. #M26144
Release #R26679



ANALYTICAL REPORT

Three water samples were received for analyses on October 2, 1980. These samples were given our identification IAD #97-F207-032-03.

All of the samples were analyzed for both dissolved (non-preserved in the field, then laboratory filtered with a 0.45 μ m filter and then nitric acid preserved) and total (non-filtered and nitric acid preserved in the field) metals. Some discrepancies may be noted when comparing dissolved and total metals data. It should be kept in mind that as values approach the detection limit for any determination, the results may become inconclusive. This fact is based on instrumental conditions alone regardless of other analytical or sampling problems; i.e., contamination at the time of sampling, or contamination or loss during digestion, etc. The detection limit is defined as twice the standard deviation of the noise level. Results may be reported with 66% confidence, by definition, at one standard deviation of the detection limit. In practical application, results approaching the detection limit are only good (at 95% confidence level) to plus or minus two (2) times the detection limit. Samples with deviations that are found to exceed this (between totals and dissolved metals) are reprepared and reanalyzed in an attempt to eliminate analytical errors. If data still differs by more than twice the detection limit, problems other than analytical exist. Attention should then be directed to sampling and/or preservation procedures or other involved aspects. The same problems will arise if the detection limit is lowered by the use of alternative analytical methods. The same amount of material will exist in the sample, but the amount of deviation from that value is lowered.

All samples for dissolved metals to be analyzed by atomic absorption were first given a light acid digestion (to be sure 0.45 μ m filtered metals are in solution). All samples to be analyzed for total metals by atomic absorption were subjected to a rigorous digestion in hydrochloric and nitric acids and, if there was sediment undissolved, filtered before AA analysis.



Table No. 1
(mg/l)

Parameter	Above Allen Mine	Below Allen Mine	Allen Mine N. Fork
Aluminum, total	0.22	0.11	<0.08
Aluminum, dissolved	<0.08	<0.08	<0.08
Beryllium, total	<0.004	<0.004	<0.004
Beryllium, dissolved	<0.004	<0.009	<0.004
Cadmium, total	<0.009	<0.009	<0.009
Cadmium, dissolved	<0.009	<0.009	<0.009
Chromium, total	0.013	0.21	0.19
Chromium, dissolved	<0.006	<0.006	<0.006
Chromium, (hexavalent) total	<0.006	<0.006	<0.006
Chromium, (hexavalent), dissolved	<0.006	<0.006	<0.006
Copper, total	<0.005	<0.005	<0.005
Copper, dissolved	<0.005	<0.005	<0.005
Iron, total	0.09	0.09	0.13
Iron, dissolved	0.03	0.02	0.02
Lead, total	<0.05	<0.05	<0.05
Lead, dissolved	<0.05	<0.05	<0.05
Manganese, total	0.022	0.024	0.015
Manganese, dissolved	0.007	0.007	0.008
Mercury, total	0.0002	0.0003	0.00008
Mercury, dissolved	0.0001	<0.0001	0.0005
Nickel, total	0.02	0.04	0.02
Nickel, dissolved	0.04	<0.01	<0.01
Selenium, total	<0.001	<0.001	<0.001
Selenium, dissolved	<0.001	<0.001	<0.001
Silver, total	0.017	0.017	0.015
Silver, dissolved	<0.004	<0.004	<0.004
Uranium, total	<0.001	0.001	<0.001
Uranium, dissolved	0.001	<0.001	0.001
Thallium, total	<0.05	<0.05	<0.05
Thallium, dissolved	<0.05	<0.05	<0.05
Zinc, total	0.048	0.098	0.060
Zinc, dissolved	0.010	0.020	0.011
Barium, total	0.3	<0.1	<0.1
Barium, dissolved	<0.1	<0.1	<0.1
Boron, total	0.37	0.32	0.26
Boron, dissolved	0.20	0.21	0.36
Arsenic, total	<0.002	<0.002	<0.002
Arsenic, dissolved	<0.002	<0.002	<0.002

Note: These samples will be reanalyzed for Lead, Cadmium, and Silver by graphite furnace atomic absorption to obtain a lower detection level, as per phone conversation - between Bruce Hale and J. Gillespie, November 24, 1980.

If there are any questions concerning these results, please call.

Bruce A. Hale

Bruce A. Hale
Section Supervisor

M. L. Jacobs

M. L. Jacobs, Ph.D., Manager
Instrumental Analysis Div.

BAH/ams

COMMERCIAL TESTING & ENGINEERING CO.



Total and dissolved Aluminum, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, Silver, Thallium, Zinc and Barium were all analyzed by flame atomic absorption and Selenium and Arsenic were determined by hydride generation atomic absorption from the above prepared solutions.

Mercury was analyzed by cold vapor flameless atomic absorption using a permanganate/persulfate digestion of the original filtered and unfiltered samples as described in EPA - Methods for Chemical Analysis of Waters and Wastes 1979 (Method 245.1 - Manual Cold Vapor Techniques).

Uranium was determined by fluorimetry using the original filtered and unfiltered samples.

Boron was analyzed colorimetrically by the EPA Methods for Chemical Analysis of Waters and Wastes, 1979 (Method 212.3 - Curcumin).

Hexavalent Chromium was analyzed colorimetrically by the procedures of Standard Methods, 14th Edition. Total Hexavalent Chromium data is of little significance since to be colored the Chromium needs to be in solution. For all Chromium to be in solution requires an acid digestion which oxidizes all the Chromium to a hexavalent state. This data was determined on an unfiltered undigested sample.

The results of these analyses are presented in Table No. 1 and are reported in milligrams per litre (mg/l) on the following page.



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES, 328 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 726-8434



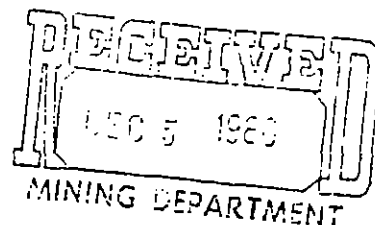
Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

December 3, 1980

Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-F208-032-13
Release No: R26680
P.O. # M26144



Analytical Report

Thirteen water samples were received for analyses on October 2, 1980. These samples were given our identification IAD #97-F208-032-13.

The samples were analyzed for total Iron, Zinc, Manganese (on both the preserved and non-preserved portions) and dissolved Iron, Zinc, Manganese, Magnesium and Calcium by flame atomic absorption. Dissolved Sodium and Potassium were analyzed by flame emission. Total Selenium (on both the preserved and non-preserved portions) was determined by hydride generation atomic absorption. All samples to be analyzed for total metals were first subjected to a rigorous digestion in nitric and hydrochloric acids.

Boron was determined colorimetrically; Sulfate turbidimetrically and Chloride and Fluoride by specific ion electrode using the procedures of EPA - Methods for Chemical Analyses of Water and Wastes, 1979. Dissolved Solids (TDS) and Suspended Solids (TSS) and Oil and Grease were determined gravimetrically by the procedures of Standard Methods, 14th edition.

pH, Carbonate, Bicarbonate, Alkalinity, Hardness and Specific Conductance were all done by Standard Methods procedures. In addition, Hardness was calculated from the dissolved contributing species (Ca, Mg, Mn, etc.) and compared against the titrated value. Sodium absorption ratio and Ion balance were also calculated and compared against TDS and Specific Conductance data.

The results of these analyses are presented in the tables below and are reported in milligrams per litre (mg/l) except pH or as otherwise noted.

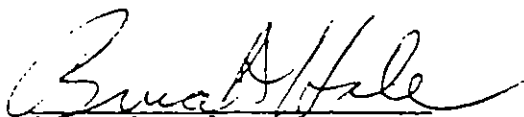


Note: For values near the detection limit:

- 1) The detection level is defined as twice the standard deviation of the noise level, or in practical application, twice the noise level.
- 2) Results may be reported with 66% confidence, by definition, at 1 standard deviation of the detection limit. In practical application, results approaching the detection limit are only good (95% confidence) plus or minus 2 times the detection limit. This is why values differ between dissolved and total metals or between preserved and non-preserved total metals when the values approach the detection limit. This is the limitation of the instrumentation alone, regardless of analytical problems with preservation, contamination, or loss in digestion, which can be assumed negated in order to get results to fall in this range.

Several samples have ion balance problems. The major anions and cations were reanalyzed to check for analytical errors. In an attempt to reconcile these problems, several other checks were made:

- 1) Hardness values were checked between data calculated from dissolved Calcium, Magnesium and Manganese analyses, and data obtained by hardness titration;
- 2) The total amount of dissolved solids was calculated from the values obtained in individual analyses and compared with the amount of dissolved solids determined gravimetrically.
- 3) The ratio of dissolved solids (in mg/l) to specific conductance (in $\mu\text{mhos/cm}$) was checked to see if it was in an acceptable range (0.55 - 0.70). Those samples with poor ion balances seem to check fairly well in these categories.


Bruce A. Hale
Section Supervisor


M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

as

Table No. 1
(mg/l)

Parameter	Dulin Well	
	9/30/80	2:25 pm
Iron (total, preserved)		0.04
Iron (total, non-preserved)		0.06
Iron (dissolved)		0.04
Manganese (total, preserved)		0.008
Manganese (total, non-preserved)		0.012
Manganese (dissolved)		<0.002
Zinc (total, preserved)		0.025
Zinc (total, non-preserved)		0.016
Zinc (dissolved)		0.021
Selenium (total, preserved)		<0.002
Selenium (total, non-preserved)		0.003
Calcium (dissolved)		50
Magnesium (dissolved)		7.5
Potassium (dissolved)		1.5
Sodium (dissolved)		2.2
Boron (total)		0.14
Alkalinity (as CaCO_3) (dissolved)		157
Bicarbonate		192
Carbonate		0
Chloride		5.4
Fluoride		0.25
Hardness (tit) as CaCO_3		152
Hardness (calc) as CaCO_3		156
pH		8.0
Sulfate		9.0
Specific Conductance ($\mu\text{mhos/cm}$)		300
TDS (gravimetrically)		129
TDS (calc)		172
TSS		21
Oil and Grease		--
Sodium Absorption Ratio		0.1
Ion Balance		1.6



Table No. 11
(mg/l)

Parameter	8.41' A1-1-1 10/1/80	14.02' A1-2-1 10/1/80	6.30' A1-3-2 10/1/80	3.78' A1-4-1 10/1/80
Iron (total, preserved)	124	123	105	25
Iron (total, non-preserved)	104	142	115	25
Iron (dissolved)	0.03	0.02	0.65	0.02
Manganese (total, preserved)	1.95	1.73	5.0	1.09
Manganese (total, non-preserved)	1.57	1.66	4.6	1.09
Manganese (dissolved)	0.57	0.73	3.6	0.74
Zinc (total, preserved)	0.31	0.38	0.28	0.17
Zinc (total, non-preserved)	0.25	0.40	0.28	0.11
Zinc (dissolved)	0.025	≤0.003	0.003	0.005
Selenium (total, preserved)	≤0.002	0.012	0.003	≤0.002
Selenium (total, non-preserved)	0.003	0.014	0.004	≤0.002
Calcium (dissolved)	74	59	45	77
Magnesium (dissolved)	13.0	11.1	11.4	15.4
Potassium (dissolved)	2.3	3.1	4.5	3.1
Sodium (dissolved)	12.7	153	11.0	52
Boron (total)	0.17	0.25	0.20	0.30
Alkalinity (as CaCO ₃) (dissolved)	180	331	225	286
Bicarbonate	220	404	274	348
Carbonate	0	6	0	0
Chloride	10	19	28	12
Fluoride	0.28	0.35	0.47	0.35
Hardness (tit) as CaCO ₃	237	212	200	231
Hardness (calc) as CaCO ₃	239	193	159	257
pH	7.9	8.2	7.8	7.8
Sulfate	77	125	2.5	78
Specific Conductance (μmhos/cm)	460	900	480	650
TDS (gravimetrically)	280	470	252	368
TDS (calc)	341	580	246	412
TSS	1530	1730	682	447
Oil and Grease	--	--	--	--
Sodium Absorption Ratio	0.5	4.8	0.4	1.4
Ion Balance	0.4	-2.3	7.2	0.9

Table No. 111
(mg/l)

Parameter	2. P.R. Upstream Allen Dump 10/1/80	3 P.R. Downstream Allen Dump 10/1/80
iron (total, preserved)	0.10	0.23
iron (total, non-preserved)	0.09	0.43
Iron (dissolved)	0.02	0.02
Manganese (total, preserved)	0.025	0.025
Manganese (total, non-preserved)	0.020	0.023
Manganese (dissolved)	0.008	0.008
Zinc (total, preserved)	≤0.004	≤0.007
Zinc (total, non-preserved)	≤0.004	≤0.004
Zinc (dissolved)	≤0.003	≤0.003
Selenium (total, preserved)	≤0.002	≤0.002
Selenium (total, non-preserved)	≤0.002	≤0.002
Calcium (dissolved)	53	42
Magnesium (dissolved)	9.4	8.9
Potassium (dissolved)	1.4	1.5
Sodium (dissolved)	5.5	5.6
Boron (total)	0.25	0.15
Alkalinity (as CaCO ₃) (dissolved)	129	124
Bicarbonate	152	151
Carbonate	3	0
Chloride	3.8	4.3
Fluoride	0.31	0.26
Hardness (tit) as CaCO ₃	150	154
Hardness (calc) as CaCO ₃	171	142
pH	8.5	8.4
Sulfate	37	38
Specific Conductance (μmhos/cm)	310	310
TDS (gravimetrically)	188	175
TDS (calc)	190	176
TSS	9	12
Oil and Grease	--	--
Sodium Absorption Ratio	0.2	0.2
ion Balance	-1.3	1.8



Table No. 1V
(mg/l)

Parameter	Allen Discharge 10/1/80	P.R. Upstream Allen-10/1/80	P.R. Down Allen-10/1/80
Iron (total, preserved)	2.0	0.16	0.89
Iron (total, non-preserved)	1.3	0.20	0.34
Iron (dissolved)	0.04	0.02	0.02
Manganese (total, preserved)	0.014	0.031	0.029
Manganese (total, non-preserved)	0.014	0.021	0.022
Manganese (dissolved)	≤0.004	0.011	0.011
Zinc (total, preserved)	0.25	0.016	0.014
Zinc (total, non-preserved)	0.03	≤0.004	≤0.004
Zinc (dissolved)	0.020	≤0.003	≤0.003
Selenium (total, preserved)	0.020	≤0.002	≤0.002
Selenium (total, non-preserved)	0.024	≤0.002	≤0.002
Calcium (dissolved)	12	52	52
Magnesium (dissolved)	4.0	8.8	9.3
Potassium (dissolved)	5.0	1.4	1.5
Sodium (dissolved)	279	5.4	10.2
Boron (total)	0.19	0.14	0.18
Alkalinity (as CaCO ₃) (dissolved)	487	129	136
Bicarbonate	524	152	148
Carbonate	34	3	9
Chloride	12	3.8	3.8
Fluoride	1.40	0.26	0.26
Hardness (tit) as CaCO ₃	52	153	150
Hardness (calc) as CaCO ₃	46	166	168
pH	8.6	8.5	8.5
Sulfate	218	39	40
Specific Conductance (μmhos/cm)	1400	310	320
TDS (gravimetrically)	820	192	219
TDS (calc)	828	190	200
TSS	29	20	9
Oil and Grease	≤2	≤2	≤2
Sodium Absorption Ratio	17.8	0.2	0.3
Ion Balance	5.5	-0.4	-1.0

Table No. V
(mg/l)

Parameter	Maxwell Discharge 10/1/80	P.R. Upstream Maxwell-10/1/80	P.R. Downstream Maxwell-10/1/80
Iron (total, preserved)	0.18	0.11	0.39
Iron (total, non-preserved)	0.08	0.09	0.35
Iron (dissolved)	0.02	0.01	0.03
Manganese (total, preserved)	≤0.007	0.018	0.023
Manganese (total, non-preserved)	≤0.007	0.013	0.014
Manganese (dissolved)	≤0.004	≤0.004	0.011
Zinc (total, preserved)	≤0.004	0.008	0.044
Zinc (total, non-preserved)	≤0.004	≤0.004	≤0.004
Zinc (dissolved)	≤0.004	≤0.003	0.003
Selenium (total, preserved)	≤0.002	≤0.002	≤0.002
Selenium (total, non-preserved)	≤0.002	≤0.002	≤0.002
Calcium (dissolved)	4.2	49	50
Magnesium (dissolved)	2.1	9.1	9.4
Potassium (dissolved)	2.3	1.7	1.5
Sodium (dissolved)	285	14.3	9.5
Boron (total)	0.34	0.22	0.33
Alkalinity (as CaCO ₃) (dissolved)	699	143	131
Bicarbonate	776	156	148
Carbonate	38	9	6
Chloride	36	6.0	5.4
Fluoride	6.8	0.35	0.35
Hardness (tit) as CaCO ₃	23	136	136
Hardness (calc) as CaCO ₃	19	160	164
pH	8.9	8.5	8.4
Sulfate	13	47	33
Specific Conductance (μmhos/cm)	1300	320	310
TDS (gravimetrically)	793	169	166
TDS (calc)	775	215	190
TSS	7	11	4
Oil and Grease	≤2	≤2	≤2
Sodium Absorption Ratio	28.4	0.5	0.3
Ion Balance	8.0	1.0	-1.5

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES, 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601

AREA CODE 312 726-8434



Reply to
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

April 6, 1981

Mr. Jack Gillespie
C F & I Steel Corporation
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-G017-032-12
P.O. #M26144
Release #26689



ADDENDUM TO ANALYTICAL REPORT

Our report sent March 31, 1981, for our batch number IAD #97-G017-032-12 was lacking data for Chlorine determinations on twelve water samples. As stated in that report, Chloride was determined by specific ion electrode methods. The results of these determinations (which were included in the ion balance calculations on the March 31 report) are presented in Table No. I below, and are reported in milligrams per litre (mg/l).

Table No. I
(mg/l)

<u>Sample</u>	<u>Chloride</u>
Purgatorie R Upstream Allen Mine Dump	2.6
Allen Upstream	2.8
Purgatorie R Downstream Allen Mine Dump	2.5
Purgatorie R Below Allen Mine	4.2
Allen Mine Discharge	8.5
Allen Mine Well Below Dump	6.9
Allen Mine Well Upstream Dump	6.9



<u>Sample</u>	<u>Chloride</u>
Purgatorie R Above Maxwell	3.2
Purgatorie R Below Maxwell	4.0
Maxwell Mine Discharge	29
AL-4-2	17
AL-3-3	4.4

If there are any questions concerning these results, please call.

Bruce A. Hale
 Bruce A. Hale
 Section Supervisor

M. L. Jacobs
 M. L. Jacobs, Ph.D., Mgr.
 Instrumental Analysis Div.

cc: David McWhorter

as



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES, 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



Reply to

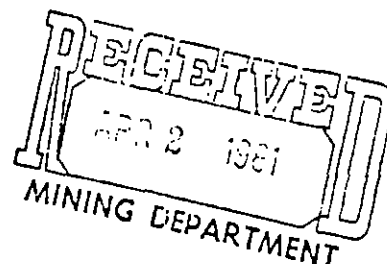
Instrumental Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

March 31, 1981

Mr. Jack Gillespie
C F & I Steel Corporation
P.O. Box 316
Pueblo, CO 81002

RE: IAD #97-G017-032-12
P.O. # M26144
Release # 26689



Analytical Report

Twelve samples were received for analyses on February 23, 1981. These samples were given our identification IAD #97-G017-032-12.

A portion of each sample was first filtered for analyses of dissolved constituents. Part of this filtrate was lightly digested for dissolved metals. Also, a non-filtered portion of each sample was given a rigorous digestion in hydrochloric and nitric acids. The digested solutions were then analyzed for Total and Dissolved Iron, Manganese, and Zinc and for Dissolved Calcium and Magnesium by flame atomic absorption. The Dissolved solution was also analyzed for Sodium and Potassium by flame emission. Selenium was analyzed on the total preparation by hydride generation atomic absorption.

Boron was determined colorimetrically by the curcumin method. Sulfate was determined turbidimetrically using the procedures of Standard Methods, 14th edition.

Conductivity, pH, Chloride and Fluoride were determined by specific ion electrode methods.

Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) were found gravimetrically by Standard Methods.

Hardness was found by Titration as was Total Alkalinity. Carbonate and Bicarbonate were found from the Alkalinity calculation.

In addition, TDS, Hardness, Ion Balance and Sodium Absorption Ratio (SAR) were calculated from the dissolved constituents as a check of the analyses.

The results of these analyses are presented in the following tables and are reported in milligrams per litre (mg/l) except pH or as noted.



Table No. I
(mg/l)

Parameter	Purgatorie R Upstream Allen Mine Dump	Allen Upstream	Purgatorie R Downstream Allen Mine Dump	Purgatorie R Below Allen Mine
Sodium(dissolved)	9.33	9.02	9.23	57.2
Calcium "	51.1	50.0	52.4	44.2
Magnesium "	11.1	10.7	11.2	10.0
Potassium "	1.17	1.18	1.16	1.74
Iron (total)	0.11	0.13	0.09	0.19
Iron (dissolved)	0.04	0.02	≤0.01	≤ 0.01
Zinc (total)	≤0.008	≤ 0.008	≤0.008	≤ 0.008
Zinc (dissolved)	0.051*	0.051*	≤0.008	≤ 0.008
Manganese (total)	0.03	0.04	0.02	0.03
Manganese (dissolved)	0.02	0.03	0.02	0.03
Selenium (total)	≤0.001	≤ 0.001	≤0.001	0.005
Boron	0.10	0.08	0.04	0.09
Total Alkalinity (as CaCO ₃)	140	143	140	201
Bicarbonate	171	174	171	245
Carbonate	0	0	0	0
Fluoride	0.11	0.40	0.40	0.61
<i>2/1/07</i> pH	7.9	8.0	8.1	8.0
Sulfate	55	54	55	77
Conductance (μmhos/cm)	241	337	354	505
TDS	203	222	209	252
TDS (calc)	216	215	217	317
TSS	12	15	14	20
Hardness (titr)	176	175	176	159
Hardness (calc)	173	169	177	152
SAR	0.3	0.3	0.3	2.0
Ion Balance	0.9	1.6	0.4	1.0
Anions (meg/l)	4.0	4.1	4.0	5.8
Cations (meg/l)	3.9	3.8	4.0	5.6

COMMERCIAL TESTING & ENGINEERING CO.



Table No. II

(mg/l)

W.L. 14' 5"
A1-2-1 well

W.L. 8.50'

A1-1-1 well

Parameter	Allen Mine Discharge	Allen Mine Well Below Dump	Allen Mine Well Upstream Dump
Sodium (dissolved)	308	79.9	13.9
Calcium "	8.7	50.1	58.8
Magnesium "	3.55	10.2	11.4
Potassium "	6.18	1.95	1.60
Iron (total)	0.87	14.1	28.1
Iron (dissolved)	0.06	≤ 0.01	≤ 0.01
Zinc (total)	≤ 0.008	0.020	0.021
Zinc (dissolved)	≤ 0.008	≤ 0.008	≤ 0.008
Manganese (total)	0.006	1.09	0.678
Manganese (dissolved)	≤ 0.006	1.07	0.513
Selenium (total)	0.026	0.003	≤ 0.001
Boron	0.06	0.07	0.12
Total Alkalinity (as CaCO ₃)	492	289	166
Bicarbonate	574	353	203
Carbonate	13	0	0
Fluoride	1.95	0.40	0.35
pH	8.6	8.0	7.7
Sulfate	204	52	62
Conductance (μmhos/cm)	1320	587	422
TDS	799	345	296
TDS (calc)	838	379	257
TSS	28	145	172
Hardness (titr)	35	169	213
Hardness (calc)	36	167	194
SAR	22	2.7	0.4
Ion Balance	0.4	0.7	1.6
Anions (meg/l)	14.4	7.1	4.8
Cations (meg/l)	14.3	6.9	4.5

Table No. III
(mg/l)

<u>Parameter</u>	<u>Purgatorie R Above Maxwell</u>	<u>Purgatorie R Below Maxwell</u>	<u>Maxwell Mine Discharge</u>
Sodium (dissolved)	19.8	19.0	308
Calcium "	46.9	46.7	6.9
Magnesium "	10.4	10.5	11.6
Potassium "	1.28	1.28	2.49
Iron (total)	0.10	0.09	0.55
Iron (dissolved)	≤ 0.01	≤ 0.01	≤ 0.01
Zinc (total)	≤ 0.008	≤ 0.008	≤ 0.008
Zinc (dissolved)	0.032*	0.016*	≤ 0.008
Manganese (total)	0.03	0.03	0.006
Manganese (dissolved)	≤ 0.01	0.02	0.006
Selenium (total)	0.002	≤ 0.003	≤ 0.004
Boron	0.09	0.10	0.13
Total Alkalinity (as CaCO ₃)	149	158	704
Bicarbonate	182	192	790
Carbonate	0	0	34
Fluoride	0.37	0.37	5.1
pH	8.1	8.2	8.8
Sulfate	59	55	14
Conductance (μmhos/cm)	368	379	1250
TDS	234	206	729
TDS (calc)	232	233	806
TSS	8	13	46
Hardness (titr)	173	170	12
Hardness (calc)	160	160	65
SAR	0.7	0.7	16.6
Ion Balance	1.3	2.1	2.0
Anions (meg/l)	4.3	4.4	15.5
Cations (meg/l)	4.1	4.1	14.8

COMMERCIAL TESTING & ENGINEERING CO.



Table No. IV
(mg/l)

Parameter	W.L. 8.50' A1-4-2	W.L. 6.16' A1-3-3
Sodium (dissolved)	70.9	16.4
Calcium (dissolved)	78.9	61.9
Magnesium (dissolved)	19.4	14.7
Potassium (dissolved)	2.00	2.39
Iron (total)	40.8	54.6
Iron (dissolved)	≤ 0.01	0.13
Zinc (total)	0.124	0.134
Zinc (dissolved)	≤ 0.008	≤ 0.008
Manganese (total)	0.98	6.14
Manganese (dissolved)	0.77	5.09
Selenium (total)	≤ 0.001	0.002
Boron	0.09	0.09
Total Alkalinity (as CaCO_3)	330	240
Bicarbonate	403	292
Carbonate	0	0
Fluoride	0.38	0.53
pH	8.0	7.9
Sulfate	90	34
Conductance ($\mu\text{mhos/cm}$)	730	472
TDS	368	143
TDS (calc)		
TSS	318	668
Hardness (titr)	131	229
Hardness (calc)	278	224
SAR	1.9	0.5
Ion Balance	1.1	1.5
Anions (meg/l)	9.0	5.6
Cations (meg/l)	8.7	5.4

* There seems to be some Zinc contamination in some of the field filtered splits. This problem did not arise with laboratory filtered splits of samples that had been received raw.

any questions concerning these results, please call.

Bruce A. Hale
Bruce A. Hale
Section Supervisor

M. L. Jacobs
M. L. Jacobs, Ph.D., Mgr.
Instrumental Analysis Div.

cc: David McWhorter
Ft. Collins
as

COMMERCIAL TESTING & ENGINEERING CO.

ed



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



Reply to

Instrument Analysis Division
490 Orchard Street
Golden, CO 80401

Phone: 303-278-9521

June 17, 1981

Mr. Jack Gillespie
C F & I Steel Corp.
P.O. Box 316
Pueblo, CO 81002

Re: IAD #97-G374-032-12
P.O. #M26144
Release #R26694

Analytical Report

Twelve water samples were received for analyses on April 14, 1981. These samples were given our identification #97-G374-032-12.

Several discrepancies were discovered in our June 9, 1981, report. The data herein is an updated version and this report is to be substituted for the June 9 report.

For your edification the changes are as follows: Full sample identification including temperatures and water levels are used herein; pH values were rechecked for the "Allen Mine Discharge" and for the "P River above the Maxwell Discharge" and those values are included herein; a typographical error was made on the hardness data for the "P River below Allen Refuse", and the correct values are included herein. We regret any problems this may have caused and that these discrepancies were not noticed sooner.

Two litre bottles of water were received for each of the twelve sampling sites. The contents of one bottle from each site were filtered and aliquots were digested and analyzed for dissolved constituents. Unfiltered aliquots from the remaining twelve bottles were subjected to a rigorous digestion in nitric and hydrochloric acids and then analyzed for total metals.

The samples were analyzed for total and dissolved Iron, Zinc, and Manganese by flame atomic absorption. Dissolved Calcium and Magnesium were also analyzed by flame atomic absorption. Dissolved Sodium and Potassium were analyzed by flame emission. Total Selenium was determined by hydride generation atomic absorption.



Charter Member

Boron was determined colorimetrically, Sulfate turbidimetrically, and Chloride and Fluoride by specific ion electrode using the procedures of EPA Methods for Chemical Analyses of Water and Wastes, 1979. Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) were determined gravimetrically by the procedures of Standard Methods, 14th edition. TDS is also calculated using the weights of constituents found in individual analyses. Alkalinity, Bicarbonate, Carbonate and Hardness were determined titrimetrically according to procedures of Standard Methods, 14th edition. Hardness was calculated from the dissolved parameters and compared with the titrated values. Specific Conductance and pH were determined by electrode response. Sodium Absorption Ratio and Ion Balance were also calculated and compared against TDS and Specific Conductance data.

The results of these analyses are presented in the tables and are reported in milligrams per litre (mg/l) except pH or otherwise noted. (Regrettably, both bottles for "P River below Allen Refuse" were filtered, so no analyses can be reported on the total metals.)


Bruce A. Hale
Section Supervisor


M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

as

TABLE No. I
(mg/l)

Parameter	AL 3-3 Maxwell 4-13-81 1:40PM Temp. 43° F H ₂ O Level 6.10'	AL 4-2 4-13-81 2:00PM Temp. 48° F H ₂ O Level 8.77'	AL-1-1 4-13-81 11:30 Temp. 46° F H ₂ O Level 8.55'	Allen Mine AL-2-1 4-13-81 11:45 Temp. 50° F H ₂ O Level 14.37'
Iron, total	6.31	3.40	4.77	1.34
Zinc, total	0.131	0.133	*0.052	0.019
Manganese, total	5.65	1.08	1.00	1.05
Selenium, total	≤0.003	≤0.003	≤0.003	≤0.003
Boron, total	≤0.05	≤0.05	≤0.05	≤0.05
Chloride	5.4	19	4.6	3.4
Fluoride	0.31	0.28	0.20	0.24
pH	7.3	7.8	7.6	7.3
Sulfate	29	60	65	54
Conductance, (μmhos/cm)	440	750	400	580
TDS	300	400	292	394
TDS calculated	282	391	253	374
TSS	134	424	380	170
ium, dissolved	20	61	15	68
Calcium, dissolved	67	72	61	61
Potassium, dissolved	5.2	3.7	3.3	3.9
Magnesium, dissolved	12.4	14.3	9.69	9.60
Iron, dissolved	0.565	0.03	0.03	0.04
Zinc, dissolved	≤0.005	0.086	0.103	≤0.005
Manganese, dissolved	0.802	0.688	0.657	1.04
Alkalinity (as CaCO ₃)	233	295	152	283
Hardness, (titr. as CaCO ₃)	217	220	186	173
Hardness, (calc. as CaCO ₃)	221	240	194	193
Bicarbonate	284	359	187	345
Carbonate	0	0	0	0
Ion Balance	0	0.6	-0.4	-0.2
SAR	0.6	1.7	0.5	2.1

* Note: The discrepancy between
Total and Dissolved Zinc
values was not resolved
even when the samples were
reprepared



TABLE No. I I
(mg/l)

Parameter	Allen Mine Water Discharge 4-13-81 11:04AM Temp 59°F	Maxwell Discharge 4-13-81 12:30PM Temp 55°F	P. River-Above Max- well Mine 4-13-81 1:20 Temp 60°F	P. River-Below Allen Mine 4- 12:10PM Temp
Iron, total	0.310	0.60	0.08	0.10
Zinc, total	≤0.005	≤0.005	≤0.005	≤0.005
Manganese, total	≤0.005	≤0.005	0.023	0.028
Selenium, total	0.024	≤0.003	≤0.003	≤0.003
Boron, total	≤0.05	≤0.05	≤0.05	≤0.05
Chloride	13	3.0	4.6	4.6
Fluoride	1.2	4.2	0.27	0.24
pH	8.2	8.5	7.9	7.9
Sulfate	215	8	49	45
Conductance, (μmhos/cm)	1400	1200	320	300
TDS	925	716	227	249
TDS calculated	854	683	212	204
TSS	6	61	3	10
Sodium, dissolved	320	292	16	20
Calcium, dissolved	9.0	5.7	45	43
Potassium, dissolved	6.6	6.0	3.9	2.9
Magnesium, dissolved	2.81	1.40	8.67	8.10
Iron, dissolved	0.03	≤0.01	≤0.01	0.02
Zinc, dissolved	≤0.005	≤0.005	≤0.005	≤0.005
Manganese, dissolved	≤0.005	0.014	0.014	≤0.005
Alkalinity, (as CaCO ₃)	502	651	146	140
Hardness, (titr. as CaCO ₃)	36	30	158	143
Hardness, (calc, as CaCO ₃)	34	20	148	141
Bicarbonate	602	739	178	170
Carbonate	5	27	0	0
Ion Balance	0.5	0.7	1.9	0.7
SAR	23.9	28.4	0.6	0.7

COMMERCIAL TESTING & ENGINEERING CO.



-5-
TABLE No. III
(mg/l)

Parameter	P. River-Below Allen Refuse 4-13-81 12:00 Temp. 56°F	P. River-Below Maxwell Mine 4-13-81 2:00PM Temp. 58°F	P. River-Upstream Allen Mine 4-13-81 11:00AM Temp. 50°F	P. River-Upstream Allen Mine 4-13-81 11:30 Temp. 54°F
Iron, total	----	0.08	0.15	0.10
Zinc, total	----	<0.005	<0.005	<0.005
Manganese, total	----	0.028	0.018	0.009
Selenium, total	----	<0.003	<0.003	<0.003
Boron, total	<0.05	<0.05	<0.05	<0.05
Chloride	4.6	5.1	4.1	4.6
Fluoride	0.23	0.29	0.21	0.24
pH	----	8.1	8.3	7.8
Sulfate	38	48	38	39
Conductance, (μmhos/cm)	280	340	300	290
TDS	246	224	181	200
TDS calculated	185	223	174	205
TSS	----	2	5	8
Sodium, dissolved	7.5	20	7.9	7.3
Calcium, dissolved	43	52	42	59
Potassium, dissolved	2.6	3.1	3.7	2.6
Magnesium, dissolved	8.77	7.77	7.61	7.95
Iron, dissolved	<0.01	0.03	0.03	0.09
Zinc, dissolved	<0.005	<0.005	0.014	<0.005
Manganese, dissolved	0.009	0.023	0.014	0.014
Alkalinity (as CaCO ₃)	123	149	123	147
Hardness, (titr. as CaCO ₃)	135	144	143	145
Hardness, (calc. as CaCO ₃)	143	162	136	180
Bicarbonate	159	182	150	179
Carbonate	0	0	0	0
Ion Balance	1.7	-0.3	1.4	-0.5
SAR	0.3	0.7	0.3	0.2

If there are any questions concerning these results, please call.



DISCHARGE MONITORING REPORT

Form Approved
OMB NO. 158-R0073

CF&I CORP (ALLEN MINE)
PO BOX 316- C/O MATHESON
PUEBLO

INSTRUCTIONS

1. Provide dates for period covered by this report in spaces marked "REPORTING PERIOD".
2. Enter reported minimum, average and maximum values under "QUANTITY" and "CONCENTRATION" in the units specified for each parameter as appropriate. Do not enter values in boxes containing asterisks. "AVERAGE" is average computed over actual time discharge is operating. "MAXIMUM" and "MINIMUM" are extreme values observed during the reporting period.
3. Specify the number of analyzed samples that exceed the maximum (and/or minimum as appropriate) permit conditions in the columns labeled "No. Ex." If none, enter "0".
4. Specify frequency of analysis for each parameter as No. analyses/No. days (e.g., "3/7" is equivalent to 3 analyses performed every 7 days.) If continuous enter "CONT."
5. Specify sample type ("grab" or "hr. composite") as applicable. If frequency was continuous, enter "NA".
6. Appropriate signature is required on bottom of this form.
7. Remove carbon and retain copy for your records.
8. Fold along dotted lines, staple and mail Original to office specified in permit.

CD 81002

12-11 14-10 117-101 121-101

CD 0000906 PERMIT NUMBER

09 DIS 1211 SIC

LATITUDE LONGITUDE

120-211 121-211 122-211 123-211 124-211 125-211 126-211 127-211 128-211 129-211 130-211

REPORTING PERIOD: FROM 80 10 01 TO 81 11 01

YEAR MO DAY YEAR MO DAY

PARAMETER		QUANTITY				UNITS	NO. EX	CONCENTRATION				UNITS	NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MINIMUM	AVERAGE	MAXIMUM				MINIMUM	AVERAGE	MAXIMUM					
FLOW IN CONDUIT	REPORTED	0	0.164	0.527				0.000	0.000	0.000			0	1/7	IN
50050	PERMIT CONDITION	0.000	0.000	0.000				0.000	0.000	0.000				1/7	IN
SOLIDS, TOTAL SUSP (SUSPENDED)	REPORTED	0.000	0.000	0.000				<1	11	28			0	1/30	GR
00530	PERMIT CONDITION	0.000	0.000	0.000				0.000	35.0	70.0				1/30	GR
INFLNT SUSP SOLIDS TOTAL	REPORTED	0.000	0.000	0.000				3	13	33				1/30	GR
40004	PERMIT CONDITION	0.000	0.000	0.000				0.000	0.000	0.000				1/30	GR
PH FIELD	REPORTED	0.000	0.000	0.000				7.4	0.000	8.2				1/7	GR
00400	PERMIT CONDITION	0.000	0.000	0.000				0.1	0.000	9.0				1/7	GR
IRON, TOTAL (AS FE)	REPORTED	0.000	0.000	0.000				<0.1	0.45	0.94			0	1/30	GR
01045	PERMIT CONDITION	0.000	0.000	0.000				0.000	3.5	7.0				1/30	GR
	REPORTED														
	PERMIT CONDITION														
	REPORTED														
	PERMIT CONDITION														
	REPORTED														
	PERMIT CONDITION														

NAME OF PRINCIPAL EXECUTIVE OFFICER

YAKLICH FRANK J.

LAST FIRST MI

TITLE OF THE OFFICER

PRESIDENT

TITLE

DATE

81 11 01

YEAR MO DAY

I certify that I am familiar with the information contained in this report and that to the best of my knowledge and belief such information is true, complete, and accurate.

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

[Signature]

DISCHARGE MONITORING REPORT

Form Approved
OMB NO. 150-R0073

CF&I CORP (ALLEN MINE)

PO BOX 316- C/O MATHESON

PUEBLO

CO 81002

INSTRUCTIONS -

1. Provide dates for period covered by this report in spaces marked "REPORTING PERIOD".
2. Enter reported minimum, average and maximum values under "QUANTITY" and "CONCENTRATION" in the units specified for each parameter as appropriate. Do not enter values in boxes containing asterisks. "AVERAGE" is average computed over actual time discharge is operating. "MAXIMUM" and "MINIMUM" are extreme values observed during the reporting period.
3. Specify the number of analyzed samples that exceed the maximum (and/or minimum as appropriate) permit conditions in the columns labeled "No. Ex." If none, enter "0".
4. Specify frequency of analysis for each parameter as No. analyses/No. days. (e.g., "3/7" is equivalent to 3 analyses performed every 7 days.) If continuous enter "CONT."
5. Specify sample type ("grab" or "hr. composite") as applicable. If frequency was continuous, enter "NA".
6. Appropriate signature is required on bottom of this form.
7. Remove carbon and retain copy for your records.
8. Fold along dotted lines, staple and mail Original to office specified in permit.

REPORTING PERIOD: FROM

TO

PARAMETER		(3 card only) QUANTITY (10-11)				UNITS	NO. EX.	(4 card only) CONCENTRATION (10-11)				UNITS	NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MINIMUM	AVERAGE	MAXIMUM				MINIMUM	AVERAGE	MAXIMUM					
FLOW IN CONDUIT	REPORTED	0.0076	0.027	0.040									1/7	IN	
50050	PERMIT CONDITION				(M)								1/7	IN	
BOD, 5-DAY, 20 DEG. C.	REPORTED						1	2	3				1/30	CO	
00310	PERMIT CONDITION				KG/DAY			30	45				1/30	CO	
INFLUENT BOD	REPORTED						2	6	9				1/30	CO	
A0005	PERMIT CONDITION				KG/DAY								1/30	CO	
SOLIDS, TOTAL SUSP (SUSPENDED)	REPORTED						<1	3	7				1/30	CO	
00530	PERMIT CONDITION				KG/DAY			30	45				1/30	CO	
INFLNT SUSP SOLIDS TOTAL	REPORTED						1	6	9				1/30	CO	
A0004	PERMIT CONDITION				KG/DAY								1/30	CO	
COLIFORM, FECAL	REPORTED						<2	53	9180				1/30	CO	
31616	PERMIT CONDITION							6000	12000				1/30	CO	
CHLORINE, TOTAL RESIDUAL	REPORTED						0.05	0.10	0.15				1/7	GR	
50060	PERMIT CONDITION				KG/DAY				0.5				1/7	GR	
PH, FIELD	REPORTED						7.4		7.9				1/7	GR	
00400	PERMIT CONDITION				SU				9.0				1/7	GR	
NAME OF PRINCIPAL EXECUTIVE OFFICER		TITLE OF THE OFFICER		DATE		I certify that I am familiar with the information contained in this report and that to the best of my knowledge and belief such information is true, complete, and accurate.						SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT			
YARLICH, FRANK J.		PRESIDENT		8/1/75											
LAST FIRST MI		TITLE		YEAR MO DAY											



February 28, 2022

Jared Ebert
Division of Reclamation, Mining and Safety
1313 Sherman St., Rm. 215
Denver, Colorado 80203

Re: New Elk Mine
Permit C-1981-012
2021 Annual Hydrology Report

Dear Mr. Ebert:

The New Elk Mine annual Hydrologic Monitoring Requirements are summarized in Table 27 Hydrologic Monitoring Frequency Requirements and Table 28 Water Quality Laboratory Analysis attached to this letter report.

In general weather conditions at New Elk Mine were dry. There were only a couple snowstorms at the beginning of the year. There were substantial precipitation events during the spring and early summer. The end of the year did not have very many

There were no discharges throughout the year as detailed below. All required monitoring of refuse, surface, and groundwater wells and rain water was completed in 2021. Monitoring of NE-5-10a and NE-5-10b also begun this year, as mining in the Blue Seam again has started.

New Elk staff revised Table 27 to include Discharge Monitoring Site 010 and remove NPDES Station 080 as it is outdated, as part of a Permit Revision to be submitted this year.

NPDES Discharge Monitoring

All NPDES discharges were monitored and reported to CDPHE on Discharge Monitoring Report forms (DMRs). Copies of these reports have already been submitted to the Division (DRMS) and are not duplicated herein.

Discharge Monitoring Site 001 did not discharge during 2021. Water flow to/from is managed by a system of pumps with a gravity flow discharge through the primary if the water level exceeds the discharge elevation of the primary decant spillway. Water has been pumped to pond 001. And there was some withdrawal in the pond by pumping the water to the mine water tank to be reused. These volumes and evaporation losses are tracked and reported to the Pueblo District of the Colorado Division of Water Resources. These losses were compensated to the stream by water New Elk has under lease from the Hill Ranch.

Discharge Monitoring of Site 004 (Pond 4) is no longer a requirement of the NPDES permit. Throughout the year water levels were minimal and no discharges occurred.

Discharge Monitoring of Site 007 (Pond 7) held water throughout most of 2021. The pond did not have any discharges throughout the year.

Discharge Monitoring of Site 008 (Pond 8) held minimal water throughout 2021. There were no discharges throughout the year. The pond has held minimal water in it and has little sediment build up since it was last cleaned in 2018.

Discharge Monitoring of Site 010 (SAE south of Pond 7) with minimal rainfall throughout the year with no discharges. The outfall was monitored carefully throughout the year and maintenance on the SAE was done. The maintenance included minor fixes to a silt fence, cleaning of ditches, and a check dams.

RDA Monitoring Wells

Three monitoring wells, **Th-201**, **TH-202**, and **TH-203**, area located on the three lower reclaimed benches of the mine's Refuse Disposal Area. These wells penetrate the compacted refuse down to the contact with the basal bedrock of the disposal area.

The intent is to monitor ground water at the refuse/bedrock contact and alert the operator to potential problems that could arise from accumulation of ground water. The monitoring plan calls for recording depths to water for these sites on a quarterly basis.

Readings were taken March 2, June 6, September 23, and December 21, 2021. This data is summarized in Table 1 RDA Monitoring Wells following this report. No significant changes were noted for any of the wells.

Surface and Groundwater Monitoring

Field data was taken in the second and fourth quarter for the Surface Water, Groundwater, and Mine Water monitoring wells. The field data is compiled in Table 2 Field Data and notes for the field data are shown in **Appendix A Field Notes**. This data is summarized in Table 3 Lab Analysis following this report. For PRS-1 and PRS-4 there were no major changes in 2021 compared to 2020. Ground water wells Paw-1, Paw-2, Paw-8, and Paw-9 had similar field data from 2020 to 2021. Mine water wells New-2, New-4, NE-1-10, and New-3 also had similar field data from 2020 to 2021.

Laboratory Analysis was done on July 8 for Paw-1 and Paw-9 for the semi-annual test. Laboratory Analysis was also completed on Paw-1, Paw-2, Paw-8, and Paw-9 on November 17. On December 1 NEW-4 and NE-1-10 were sampled. On December 16 NEW-2, NE-5-10a, and NE-5-10b were sampled. The lab analysis and field notes accidentally added mislabeled these samples as NE-6-10a and NE-6-10b. Finally on December 20 PRS-1 and PRS-4 were sampled. The analytical results for these samples are shown in **Appendix B Lab Analytics**. This data was compared to the historical information available in previous AHRs (see 2008 for best tabulation): All observed data fell within the historical range of each parameter.

Analysis of Alluvial Groundwater Data

The groundwater wells did not show much change from 2020 to 2021. All data for Paw-1, Paw-2, Paw-8 and Paw-9 were consistent with previous year's data.

Rain Water Monitoring

2021 was a dry year. Snowfall was minimal throughout the first part of the year, followed by a wet spring and early Summer seasons. There were only six events of over an inch of rainfall in a 24-hour period; the last occurrence was July 24. The rest of the year was dry until snowfall began in December.

Comments

New Elk worked with DRMS in revising the water monitoring program in 2021 that amended Table 27.

Please advise me if any additional information is needed.

Regards

A handwritten signature in cursive script that reads "Nicholas Mason".

Nicholas Mason

Table 1 RDA Monitoring Wells				
	Depth to Water in Feet			
Quarter	Q1	Q2	Q3	Q4
Date	2-Mar	6-Jun	23-Sep	21-Dec
Th-01	42.9	43	42.7	43.1
Th-02	70.7	71	71.1	71.1
Th-03	93.5	93.8	93.9	93.6

Table 2 Field Data												
Second Quarter 2020	Surface Water		Groundwater Wells				Mine Water					
	PRS-1	PRS-4	PAW-1	PAW-2	PAW-8	PAW-9	NEW-2	NEW-4	NE-5-10a	NE-5-10b	NEW-1-10	NEW-3
Date	22-Jun	22-Jun	8-Jul	22-Jun	22-Jun	8-Jul	4-Jun	4-Jun			15-Apr	9-Apr
<u>Field Measurements</u>												
Depth to Water (ft)	-	-	7.7	16.3	33.9	15.2	346.5	353			305.3	421.6
Flow Rate (cfs)	79.380	76.430	-	-	-	-	-	-			-	-
Ph (S.U.)	9.10	8.78	8.93	7.77	7.60	8.05	-	-			-	-
Conductivity ($\mu\text{ohms}/\text{cm}^2$)	194	195	257	894	1165	1026	-	-			-	-
Temperature ($^{\circ}\text{C}$)	15.1	16.4	12.0	11.6	14.8	11.4	-	-			-	-
Fourth Quarter 2020	Surface Water		Groundwater Wells				Mine Water					
	PRS-1	PRS-4	PAW-1	PAW-2	PAW-8	PAW-9	NEW-2	NEW-4	NE-5-10a	NE-5-10b	NEW-1-10	NEW-3
Date	20-Dec	20-Dec	17-Nov	17-Nov	17-Nov	17-Nov	16-Dec	1-Dec	16-Dec	16-Dec	1-Dec	16-Dec
<u>Field Measurements</u>												
Depth to Water (ft)	-	-	8	17.8	33.5	15.5	341.7	348.7	663.85	370.4	304.9	421.6
Flow Rate (cfs)	9.860	12.350	-	-	-	-	-	-	-	-	-	-
Ph (S.U.)	8.85	8.67	8.90	7.40	7.23	7.96	8.16	8.25	9.11	8.35	10.98	-
Conductivity ($\mu\text{ohms}/\text{cm}^2$)	382	403	276	7	1302	1052	2.16	2.18	1733	836	1408	-
Temperature ($^{\circ}\text{C}$)	1.2	1.7	9.2	7.96	11.7	12.6	15.7	18.8	21.7	17.7	12.1	-

Table 3 Lab Analysis													
	Surface Water		Groundwater Wells						Mine Water				
	PRS-1	PRS-4	PAW-1	PAW-9	PAW-1	PAW-2	PAW-8	PAW-9	NEW-2	NEW-4	NE-5-10a	NE-5-10b	NEW-1-10
Date	20-Dec	20-Dec	8-Jul	8-Jul	17-Nov	17-Nov	17-Nov	17-Nov	16-Dec	1-Dec	16-Dec	16-Dec	1-Dec
Laboratory Analysis													
Total Suspended Solids (TSS) (mg/l)	<5	5	59.0	6.0	23.0	340.0	96.0	14.0	<5	<5	13.0	26.0	5.0
Carbonate (mg/l)	<2	4.3	<2	<2	<2	<2	<2	<2	54	89.5	136	17.7	323
Bicarbonate (mg/l)	136	137	102	417	116	414	487	442	1070	1180	938	458	404
Chloride (mg/l)	2.19	2.31	14.20	20.60	11.90	18.70	35.30	17.90	9.07	11.50	5.47	5.29	7.14
Sulfate (mg/l)	40.2	41.2	3.6	85.8	3.1	52.3	135.0	77.0	143.0	19.0	1.8	13.3	21.0
Manganese total (Mn) (mg/l)	0.023	0.034	0.091	0.011	0.084	1.710	1.200	1.100	0.052	0.011	0.013	0.034	<0.01
Manganese dissolved (Mn) (mg/l)	<0.01	0.011	<0.01	<0.01	0.058	1.080	0.049	<0.01	0.017	<0.01	<0.01	0.017	<0.01
Calcium (Ca) (mg/l)	48.3	49	14.7	69.5	18.9	89.6	103.0	68.7	11.4	5.4	2.6	<0.008	2.3
Magnesium (Mg) (mg/l)	8.00	8.15	8.12	19.30	9.15	17.40	22.80	18.30	5.01	2.75	0.82	0.31	2.54
Potassium (K) (mg/l)	1.54	1.50	1.74	2.35	1.51	2.75	1.79	2.44	6.98	5.32	2.89	1.42	4.12
Sodium (Na) (mg/l)	6.99	7.55	18.6	111.0	17.9	76.8	149.0	123.0	487	526	417	189	304
Iron (Fe) (mg/l), Total Dissolved	<0.06	<0.06	0.196	0.06	<0.06	0.816	<0.06	<0.06	0.13	<0.06	<0.06	0.161	<0.06
Iron (Fe) (mg/l), Total Recoverable	0.165	0.259	25.60	0.33	10.20	83.30	5.63	0.84	0.88	0.13	0.43	1.79	0.22
Sodium Absorption Rate (SAR)	0.25	0.27	0.98	3.10	0.86	2.00	3.50	3.40	31	47	59	31	33
Total Dissolved Solids (TDS) (mg/l)	216	216	130	592	124	480	754	578	1360	1400	1100	510	826
Hardness (Calculated) (mg/l)	154	156	70	253	85	295	351	247	49	25	10	7	16

Table 4 New Elk Rain Gauge Data

Date	Rain Fall(in)	Date	Rain Fall(in)	Date	Rain Fall(in)	Date	Rain Fall(in)	Date	Rain Fall(in)
1-Apr	0.0	9-May	0.0	16-Jun	0.0	24-Jul	0.1	31-Aug	0.0
2-Apr	0.0	10-May	0.2	17-Jun	0.0	25-Jul	0.1	1-Sep	0.4
3-Apr	0.0	11-May	0.2	18-Jun	0.0	26-Jul	0.4	2-Sep	0.0
4-Apr	0.0	12-May	0.5	19-Jun	0.0	27-Jul	0.0	3-Sep	0.0
5-Apr	0.0	13-May	0.0	20-Jun	0.0	28-Jul	0.0	4-Sep	0.0
6-Apr	0.0	14-May	0.0	21-Jun	0.0	29-Jul	0.0	5-Sep	0.0
7-Apr	2.0	15-May	0.0	22-Jun	0.0	30-Jul	0.0	6-Sep	0.0
8-Apr	0.0	16-May	0.0	23-Jun	0.0	31-Jul	0.0	7-Sep	0.0
9-Apr	0.0	17-May	0.0	24-Jun	0.0	1-Aug	0.0	8-Sep	0.0
10-Apr	0.0	18-May	2.0	25-Jun	0.0	2-Aug	0.7	9-Sep	0.0
11-Apr	0.0	19-May	0.4	26-Jun	0.0	3-Aug	0.0	10-Sep	0.0
12-Apr	0.0	20-May	0.1	27-Jun	0.0	4-Aug	0.4	11-Sep	0.0
13-Apr	0.0	21-May	0.0	28-Jun	0.7	5-Aug	0.0	12-Sep	0.0
14-Apr	0.0	22-May	0.2	29-Jun	0.1	6-Aug	0.0	13-Sep	0.0
15-Apr	0.0	23-May	0.0	30-Jun	0.2	7-Aug	0.0	14-Sep	0.0
16-Apr	0.0	24-May	0.0	1-Jul	0.2	8-Aug	0.0	15-Sep	0.5
17-Apr	1.5	25-May	0.0	2-Jul	0.1	9-Aug	0.0	16-Sep	0.0
18-Apr	0.0	26-May	0.0	3-Jul	0.1	10-Aug	0.0	17-Sep	0.0
19-Apr	0.0	27-May	0.0	4-Jul	0.5	11-Aug	0.0	18-Sep	0.0
20-Apr	0.0	28-May	0.0	5-Jul	0.3	12-Aug	0.0	19-Sep	0.0
21-Apr	0.0	29-May	0.0	6-Jul	0.0	13-Aug	0.0	20-Sep	0.0
22-Apr	3.0	30-May	0.0	7-Jul	0.0	14-Aug	0.0	21-Sep	0.0
23-Apr	0.0	31-May	0.0	8-Jul	0.0	15-Aug	0.0	22-Sep	0.0
24-Apr	0.0	1-Jun	1.1	9-Jul	0.0	16-Aug	0.4	23-Sep	0.0
25-Apr	0.0	2-Jun	0.0	10-Jul	0.0	17-Aug	0.0	24-Sep	0.0
26-Apr	0.0	3-Jun	0.0	11-Jul	0.0	18-Aug	0.0	25-Sep	0.0
27-Apr	0.0	4-Jun	0.8	12-Jul	0.0	19-Aug	0.0	26-Sep	0.0
28-Apr	0.0	5-Jun	0.0	13-Jul	0.0	20-Aug	0.0	27-Sep	0.0
29-Apr	0.0	6-Jun	0.0	14-Jul	0.0	21-Aug	0.0	28-Sep	0.2
30-Apr	0.0	7-Jun	0.1	15-Jul	0.4	22-Aug	0.0	29-Sep	0.0
1-May	0.0	8-Jun	0.1	16-Jul	0.0	23-Aug	0.0	30-Sep	0.5
2-May	0.0	9-Jun	0.0	17-Jul	0.0	24-Aug	0.0		
3-May	0.0	10-Jun	0.0	18-Jul	0.0	25-Aug	0.0		
4-May	0.2	11-Jun	0.0	19-Jul	0.0	26-Aug	0.0		
5-May	0.0	12-Jun	0.0	20-Jul	0.0	27-Aug	0.1		
6-May	0.0	13-Jun	0.0	21-Jul	0.0	28-Aug	0.0		
7-May	0.0	14-Jun	0.0	22-Jul	0.0	29-Aug	0.0		
8-May	0.0	15-Jun	0.0	23-Jul	1.4	30-Aug	0.0		

Table 27 Hydrologic Monitoring Frequency Requirements

Site	Water level or flow	Field Measurements	Laboratory Analysis	NPDES List
PRS-1	S	S	A	
PRS-1a**	Q	Q	Q	
PRS-4 (aka NE080)	S	S	A	
PRS-4a**	Q (then S)	Q (then S)	Q (then A)	
TH-201	Q			
TH-202	Q			
TH-203	Q			
PAW-1	S	S	S	
PAW-1a**	Q (then s)	Q (then s)	Q (then s)	
PAW-2	S	S	A	
PAW-8	S	S	A	
PAW-9	S	S	S	
NEW-2	S	A	A	
NEW-3	S			
NEW-4	S	A	A	
NE-1-10	S	A	A	
NE-6-10a *	Q	Q	Q	
NE-6-10b *	Q	Q	Q	
NM-20 *	Q	Q	Q	
NM-21 *	Q	Q	Q	
NM-22 *	Q	Q	Q	
NM-23 *	Q	Q	Q	
SF-2 *	Q	Q	Q	
NPDES Stations				
NE 001 (Pond 1)				+
NE 004 (Pond 4)				+
NE 007 (Pond 7)				+
NE 008 (Pond 8)				+
NE 010 (Outfall 10)				+
NE 011				+
NE 012				+

KEY S=Semi annually (2nd and 4th quarters) Q=quarterly A=Annually(4th quarter)

* Monitoring of the wells is suspended while the mine remains inactive, but the full monitoring program will be resumed prior to any resumption of mining.

** Monitor quarterly for one year, then frequency will change as indicated in table

NPDES permit for frequency and required analysis

the coal shipping facilities become active, the Division will be notified in writing and the frequency of monitoring reviewed and increased, if operational parameters warrant.

+see

Note: If

Table 28 Water Quality Analysis Parameters	
Field Measurements	Units
Flow rate/water level	cfs/feet below top of casing
pH	
Conductivity	
Temperature	
Laboratory Analysis (both Surface and FW unless noted)	Units
Total Suspended Solids (TSS)	mg/l
Total Dissolved Solids (TDS)	mg/l
Carbonate	mg/l
Bicarbonate	mg/l
Chloride	mg/l
Sulfate	mg/l
Manganese (Mn)	mg/l total and dissolved
Potassium (K)	mg/l
Sodium (Na)	mg/l
Calcium (Ca)	mg/l
Magnesium (Mg)	mg/l
Iron (Fe)	mg/l total, diss, total recoverable ¹
Hardness (calculated)	calculated
Sodium Absorption Ratio	unit
Sediment Ponds	
Frequency and analysis in accordance with NPDES permit	
¹ surface water only	

Appendix A

(Field Notes)

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: 04/09/2021 WEATHER: Clear 47°F 0.0" rainfall

DATE: 04/09/2021 WEATHER: Clear 47°F 0.0"rainfall

[illegible]

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

Date:

Weather:

Clear, 0.8" Rain Fall / 24 Hours, 48°F

[illegible]

WEATHER: Clear 93°F 0.0 rain fall

DATE: 6/22/21

WEATHER:

TEMPERATURE

SAMPLE (Y/N)

SAMPLED BY

NOTES

DATE	NOTES
Jan	Semi Annual Test

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: July 8, 2021 WEATHER: Clear 84°F 0.3" rainfall/24 hrs

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
PAW 1	13:15	7.7'	8.93	257 μ S	12°C	Yes	Jim Begno	Samples sent to ACZ Labs. Semi annual test
PAW 9	13:45	15.2'	8.05	1026 μ S	11.4°C	Yes	Jim Begno	Samples sent to ACZ Labs. Semi annual test

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

Date: 11/17/21 Weather: Clear, 0.0" Rainfall / last 24 hours, 63°F

Site ID	Time	Depth	pH	Conductivity	Temperature Degrees C	Laboratory Sample (Y/N)	Sampled By	Notes
Paw 1	12:45	8.0	8.90	276	9.2	Y	Nick Mason	Sample sent to ACZ Labs.
Paw 2	1:00	17.8	7.40	1064	12.0	Y	Nick Mason	Sample sent to ACZ Labs
Paw 8	1:25	33.5	7.23	1302	11.7	Y	Nick Mason	Sample sent to ACZ Labs
Paw 9	1:50	15.5	7.96	1052	12.6	Y	Nick Mason	Sample sent to ACZ Labs

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: 12-01-21 WEATHER:

[illegible]

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: 12-16-2021 WEATHER: SUNNY 70° F

SITE ID	TIME	DEPTH	pH	CONDUCTIVITY	TEMPERATURE	SAMPLE (Y/N)	SAMPLED BY	NOTES
NEW 3	11:15	421.6'	No	No	No	No		
NE-6- 10-A	12:30	663.85'	9.11	1733 μ S	21.7°C	Yes	Vince Messerotti	Samples sent to ACZ Labs
NE-6- 10-B	13:04	370.4'	8.35	836 μ S	17.7°C	Yes	Vince Messerotti	Samples sent to ACZ Labs
New 2	13:46	341.7'	8.16	2.16 mS	15.7°C	Yes	Vince Messerotti	Samples sent to ACZ Labs

NEW ELK MINE HYDROLOGIC MONITORING FIELD REPORT

DATE: 12-20-2021 WEATHER:

Surf 62°F

[illegible]

Appendix B

(Lab Analytics)

August 02, 2021

Report to:

Jim Begano
New Elk Coal Co. , LLC
12250 Hwy. 12
Weston, CO 81091

Bill to:

Accounts Payable
New Elk Coal Co. , LLC
12250 Highway 12
Weston, CO 81091

cc: Nick Mason

Project ID:

ACZ Project ID: L67040

Jim Begano:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on July 12, 2021. This project has been assigned to ACZ's project number, L67040. Please reference this number in all future inquiries.

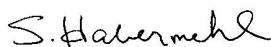
All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L67040. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after September 01, 2021. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed
and approved this report.



New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 1

ACZ Sample ID: **L67040-01**

Date Sampled: 07/08/21 13:15

Date Received: 07/12/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002- 31.5.31 (2009)								07/14/21 11:09	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								07/18/21 14:43	kja
Total Hot Plate Digestion	M200.2 ICP								07/18/21 14:48	kja
Total Recoverable Digestion	M200.2 ICP-MS								07/19/21 16:00	mfm
Total Recoverable Digestion	M200.2 ICP								07/20/21 13:31	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.00123			mg/L	0.0002	0.001	07/21/21 16:49	mfm
Boron, total	M200.7 ICP	1	<0.03	U		mg/L	0.03	0.1	07/20/21 3:37	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	07/18/21 12:14	jlw
Calcium, dissolved	M200.7 ICP	1	14.7			mg/L	0.1	0.5	07/20/21 17:23	kja
Chromium, total recoverable	M200.8 ICP-MS	1	0.00083	B		mg/L	0.0005	0.002	07/21/21 16:49	mfm
Copper, potentially dissolved	M200.7 ICP	1	0.430			mg/L	0.01	0.05	07/18/21 12:14	jlw
Iron, dissolved	M200.7 ICP	1	0.196			mg/L	0.06	0.15	07/20/21 17:23	kja
Iron, total	M200.7 ICP	1	20.9		*	mg/L	0.06	0.15	07/20/21 3:37	kja
Iron, total recoverable	M200.7 ICP	1	25.6		*	mg/L	0.06	0.15	07/21/21 11:16	kja
Magnesium, dissolved	M200.7 ICP	1	8.12			mg/L	0.2	1	07/20/21 17:23	kja
Manganese, dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	07/20/21 17:23	kja
Manganese, potentially dissolved	M200.7 ICP	1	0.045	B		mg/L	0.01	0.05	07/18/21 12:14	jlw
Manganese, total	M200.7 ICP	1	0.091			mg/L	0.01	0.05	07/20/21 3:37	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	07/27/21 10:12	mlh
Potassium, dissolved	M200.7 ICP	1	1.74			mg/L	0.2	1	07/20/21 17:23	kja
Sodium, dissolved	M200.7 ICP	1	18.6			mg/L	0.2	1	07/20/21 17:23	kja
Zinc, potentially dissolved	M200.7 ICP	1	<0.02	U		mg/L	0.02	0.05	07/18/21 12:14	jlw

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 1

ACZ Sample ID: **L67040-01**

Date Sampled: 07/08/21 13:15

Date Received: 07/12/21

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	102		*	mg/L	2	20	07/22/21 0:00	eep
Carbonate as CaCO ₃		1	<2	U	*	mg/L	2	20	07/22/21 0:00	eep
Hydroxide as CaCO ₃		1	<2	U	*	mg/L	2	20	07/22/21 0:00	eep
Total Alkalinity		1	102		*	mg/L	2	20	07/22/21 0:00	eep
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-4.2			%			08/02/21 0:00	calc
Sum of Anions			2.5			meq/L			08/02/21 0:00	calc
Sum of Cations			2.3			meq/L			08/02/21 0:00	calc
Chloride	SM4500Cl-E	1	14.2		*	mg/L	0.5	2	07/29/21 9:59	syw
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		70			mg/L	0.2	5	08/02/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							07/19/21 13:48	cgm
Residue, Filterable (TDS) @180C	SM2540C	1	130		*	mg/L	20	40	07/14/21 16:11	jck
Residue, Non-Filterable (TSS) @105C	SM2540D	1	59.0		*	mg/L	5	20	07/13/21 14:41	cgm
Sodium Adsorption Ratio in Water	USGS - I1738-78		0.98						08/02/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	1	3.6	B	*	mg/L	1	5	07/26/21 11:06	syw

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 9

ACZ Sample ID: **L67040-02**

Date Sampled: 07/08/21 13:45

Date Received: 07/12/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002- 31.5.31 (2009)								07/14/21 11:28	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								07/18/21 14:43	kja
Total Hot Plate Digestion	M200.2 ICP								07/18/21 16:08	kja
Total Recoverable Digestion	M200.2 ICP-MS								07/19/21 16:00	mfm
Total Recoverable Digestion	M200.2 ICP								07/20/21 14:13	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	<0.0002	U		mg/L	0.0002	0.001	07/21/21 16:51	mfm
Boron, total	M200.7 ICP	1	0.034	B		mg/L	0.03	0.1	07/20/21 3:46	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	07/18/21 12:17	jlw
Calcium, dissolved	M200.7 ICP	1	69.5			mg/L	0.1	0.5	07/20/21 17:32	kja
Chromium, total recoverable	M200.8 ICP-MS	1	<0.0005	U		mg/L	0.0005	0.002	07/21/21 16:51	mfm
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	07/18/21 12:17	jlw
Iron, dissolved	M200.7 ICP	1	0.060	B		mg/L	0.06	0.15	07/20/21 17:32	kja
Iron, total	M200.7 ICP	1	0.295		*	mg/L	0.06	0.15	07/20/21 3:46	kja
Iron, total recoverable	M200.7 ICP	1	0.330			mg/L	0.06	0.15	07/21/21 11:25	kja
Magnesium, dissolved	M200.7 ICP	1	19.3			mg/L	0.2	1	07/20/21 17:32	kja
Manganese, dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	07/20/21 17:32	kja
Manganese, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	07/18/21 12:17	jlw
Manganese, total	M200.7 ICP	1	0.011	B		mg/L	0.01	0.05	07/20/21 3:46	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	07/27/21 10:15	mlh
Potassium, dissolved	M200.7 ICP	1	2.35			mg/L	0.2	1	07/20/21 17:32	kja
Sodium, dissolved	M200.7 ICP	1	111			mg/L	0.2	1	07/20/21 17:32	kja
Zinc, potentially dissolved	M200.7 ICP	1	0.022	B		mg/L	0.02	0.05	07/18/21 12:17	jlw

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 9

ACZ Sample ID: **L67040-02**

Date Sampled: 07/08/21 13:45

Date Received: 07/12/21

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	417		*	mg/L	2	20	07/22/21 0:00	eep
Carbonate as CaCO ₃		1	<2	U	*	mg/L	2	20	07/22/21 0:00	eep
Hydroxide as CaCO ₃		1	<2	U	*	mg/L	2	20	07/22/21 0:00	eep
Total Alkalinity		1	417		*	mg/L	2	20	07/22/21 0:00	eep
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-4.8			%			08/02/21 0:00	calc
Sum of Anions			11			meq/L			08/02/21 0:00	calc
Sum of Cations			10.0			meq/L			08/02/21 0:00	calc
Chloride	SM4500Cl-E	1	20.6		*	mg/L	0.5	2	07/29/21 9:59	syw
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		253			mg/L	0.2	5	08/02/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							07/19/21 13:50	cgm
Residue, Filterable (TDS) @180C	SM2540C	1	592		*	mg/L	20	40	07/14/21 16:14	jck
Residue, Non-Filterable (TSS) @105C	SM2540D	1	6.0	B	*	mg/L	5	20	07/13/21 14:44	cgm
Sodium Adsorption Ratio in Water	USGS - I1738-78		3.1						08/02/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	5	85.8		*	mg/L	5	25	07/26/21 11:14	syw



Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

New Elk Coal Co. , LLC

ACZ Project ID: **L67040**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L67040-01	WG523769	Bicarbonate as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
		Carbonate as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG524205	Chloride	SM4500Cl-E	Q6	Sample was received above recommended temperature.
			SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG523769	Hydroxide as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG523559	Iron, total	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG523690	Iron, total recoverable	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG523232	Residue, Filterable (TDS) @180C	SM2540C	Q6	Sample was received above recommended temperature.
			SM2540C	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG523109	Residue, Non-Filterable (TSS) @105C	SM2540D	Q6	Sample was received above recommended temperature.
			SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG523976	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07/-11 - TURBIDIMETRIC	Q6	Sample was received above recommended temperature.
	WG523769	Total Alkalinity	SM2320B - Titration	Q6	Sample was received above recommended temperature.
			SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

New Elk Coal Co. , LLC

ACZ Project ID: **L67040**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L67040-02	WG523769	Bicarbonate as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
		Carbonate as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG524205	Chloride	SM4500Cl-E	Q6	Sample was received above recommended temperature.
			SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG523769	Hydroxide as CaCO ₃	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG523559	Iron, total	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG523232	Residue, Filterable (TDS) @180C	SM2540C	Q6	Sample was received above recommended temperature.
			SM2540C	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG523109	Residue, Non-Filterable (TSS) @105C	SM2540D	Q6	Sample was received above recommended temperature.
			SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG523976	Sulfate	SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
			D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG523769	Total Alkalinity	D516-02/-07/-11 - TURBIDIMETRIC	Q6	Sample was received above recommended temperature.
			SM2320B - Titration	Q6	Sample was received above recommended temperature.
			SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

New Elk Coal Co. , LLC

ACZ Project ID: **L67040**

No certification qualifiers associated with this analysis

New Elk Coal Co. , LLC

ACZ Project ID: L67040

Date Received: 07/12/2021 12:55

Received By:

Date Printed: 7/13/2021

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody form or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☒	☐
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody form complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☒	☐	☐
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
-----	-----	-----	-----	-----
6863	17.1	<=6.0	15	Yes

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s) but was thawed by receipt at ACZ.

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

New Elk Coal Co. , LLC

ACZ Project ID: L67040

Date Received: 07/12/2021 12:55

Received By:

Date Printed: 7/13/2021

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

December 07, 2021

Report to:

Jim Begano
New Elk Coal Co. , LLC
12250 Hwy. 12
Weston, CO 81091

Bill to:

Accounts Payable
New Elk Coal Co. , LLC
12250 Highway 12
Weston, CO 81091

cc: Nick Mason

Project ID:

ACZ Project ID: L69988

Jim Begano:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on November 18, 2021. This project has been assigned to ACZ's project number, L69988. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L69988. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 06, 2022. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and
approved this report.



New Elk Coal Co. , LLC

December 07, 2021

Project ID:

ACZ Project ID: L69988

Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 4 groundwater samples from New Elk Coal Co. , LLC on November 18, 2021. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L69988. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

Holding Times

All analyses were performed within EPA recommended holding times.

Sample Analysis

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The following required further explanation not provided by the Extended Qualifier Report:

1. TDS (N1) - Oven range is 80 C to 91 C. Over the weekend, the oven had a minor low temperature out of range. When the oven temperature was checked on Monday 11/29/21, the minimum temperature read at 69.7 C. The WG was removed from the oven on 11/29/21 when the oven was back in range.

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 1

ACZ Sample ID: **L69988-01**

Date Sampled: 11/17/21 12:45

Date Received: 11/18/21

Sample Matrix: *Groundwater*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								10/20/21 9:49	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								11/23/21 12:51	kja
Total Hot Plate Digestion	M200.2 ICP				*				12/01/21 14:23	kja
Total Recoverable Digestion	M200.2 ICP-MS								11/24/21 9:00	mfm
Total Recoverable Digestion	M200.2 ICP								12/01/21 17:47	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.00051	B		mg/L	0.0002	0.001	11/30/21 18:16	bsu
Boron, total	M200.7 ICP	2	<0.06	U		mg/L	0.06	0.2	12/02/21 20:12	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	11/22/21 15:13	kja
Calcium, dissolved	M200.7 ICP	1	18.9			mg/L	0.1	0.5	11/29/21 16:29	kja
Chromium, total recoverable	M200.8 ICP-MS	1	0.00113	B		mg/L	0.0005	0.002	11/30/21 18:16	bsu
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	11/22/21 15:13	kja
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	11/29/21 16:29	kja
Iron, total	M200.7 ICP	2	10.9			mg/L	0.12	0.3	12/02/21 20:12	kja
Iron, total recoverable	M200.7 ICP	1	10.2			mg/L	0.06	0.15	12/02/21 17:27	kja
Magnesium, dissolved	M200.7 ICP	1	9.15			mg/L	0.2	1	11/29/21 16:29	kja
Manganese, dissolved	M200.7 ICP	1	0.012	B		mg/L	0.01	0.05	11/29/21 16:29	kja
Manganese, potentially dissolved	M200.7 ICP	1	0.058			mg/L	0.01	0.05	11/22/21 15:13	kja
Manganese, total	M200.7 ICP	2	0.084	B		mg/L	0.02	0.1	12/02/21 20:12	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/21 15:04	mlh
Potassium, dissolved	M200.7 ICP	1	1.51			mg/L	0.2	1	11/29/21 16:29	kja
Sodium, dissolved	M200.7 ICP	1	17.9			mg/L	0.2	1	11/29/21 16:29	kja
Zinc, potentially dissolved	M200.7 ICP	1	<0.02	U		mg/L	0.02	0.05	11/22/21 15:13	kja

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 1

ACZ Sample ID: **L69988-01**

Date Sampled: 11/17/21 12:45

Date Received: 11/18/21

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	116			mg/L	2	20	11/24/21 0:00	eep
Carbonate as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Total Alkalinity		1	116			mg/L	2	20	11/24/21 0:00	eep
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-3.8			%			12/07/21 0:00	calc
Sum of Anions			2.7			meq/L			12/07/21 0:00	calc
Sum of Cations			2.5			meq/L			12/07/21 0:00	calc
Chloride	SM4500Cl-E	1	11.9		*	mg/L	0.5	2	12/01/21 14:30	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		85			mg/L	0.2	5	12/07/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							11/30/21 7:06	mlh
Residue, Filterable (TDS) @180C	SM2540C	1	124			mg/L	20	40	11/22/21 16:13	anc
Residue, Non-Filterable (TSS) @105C	SM2540D	1	23.0		*	mg/L	5	20	11/22/21 16:20	scd
Sodium Adsorption Ratio in Water	USGS - 11738-78		0.86						12/07/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	1	3.1	B	*	mg/L	1	5	12/03/21 12:32	wtc

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 2

ACZ Sample ID: **L69988-02**

Date Sampled: 11/17/21 13:00

Date Received: 11/18/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								10/20/21 9:55	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								11/23/21 12:51	kja
Total Hot Plate Digestion	M200.2 ICP								12/01/21 14:36	kja
Total Recoverable Digestion	M200.2 ICP-MS								11/24/21 9:00	mfm
Total Recoverable Digestion	M200.2 ICP								12/01/21 18:28	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.00641			mg/L	0.0002	0.001	11/30/21 18:18	bsu
Boron, total	M200.7 ICP	1	<0.03	U		mg/L	0.03	0.1	12/02/21 20:16	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	11/22/21 15:29	kja
Calcium, dissolved	M200.7 ICP	1	89.6			mg/L	0.1	0.5	11/29/21 16:32	kja
Chromium, total recoverable	M200.8 ICP-MS	1	0.0156			mg/L	0.0005	0.002	11/30/21 18:18	bsu
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	11/22/21 15:29	kja
Iron, dissolved	M200.7 ICP	1	0.816			mg/L	0.06	0.15	11/29/21 16:32	kja
Iron, total	M200.7 ICP	1	91.3			mg/L	0.06	0.15	12/02/21 20:16	kja
Iron, total recoverable	M200.7 ICP	1	83.3			mg/L	0.06	0.15	12/02/21 17:42	kja
Magnesium, dissolved	M200.7 ICP	1	17.4			mg/L	0.2	1	11/29/21 16:32	kja
Manganese, dissolved	M200.7 ICP	1	1.08			mg/L	0.01	0.05	11/29/21 16:32	kja
Manganese, potentially dissolved	M200.7 ICP	1	1.39			mg/L	0.01	0.05	11/22/21 15:29	kja
Manganese, total	M200.7 ICP	1	1.71			mg/L	0.01	0.05	12/02/21 20:16	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/21 15:05	mlh
Potassium, dissolved	M200.7 ICP	1	2.75			mg/L	0.2	1	11/29/21 16:32	kja
Sodium, dissolved	M200.7 ICP	1	76.8			mg/L	0.2	1	11/29/21 16:32	kja
Zinc, potentially dissolved	M200.7 ICP	1	0.042	B		mg/L	0.02	0.05	11/22/21 15:29	kja

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 2

ACZ Sample ID: **L69988-02**

Date Sampled: 11/17/21 13:00

Date Received: 11/18/21

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	414			mg/L	2	20	11/24/21 0:00	eep
Carbonate as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Total Alkalinity		1	414		*	mg/L	2	20	11/24/21 0:00	eep
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-2.1			%			12/07/21 0:00	calc
Sum of Anions			9.9			meq/L			12/07/21 0:00	calc
Sum of Cations			9.5			meq/L			12/07/21 0:00	calc
Chloride	SM4500Cl-E	1	18.7		*	mg/L	0.5	2	12/01/21 14:30	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		295			mg/L	0.2	5	12/07/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							11/30/21 7:09	mlh
Residue, Filterable (TDS) @180C	SM2540C	2	480		*	mg/L	40	80	11/24/21 11:11	anc
Residue, Non-Filterable (TSS) @105C	SM2540D	2	340		*	mg/L	10	40	11/22/21 16:22	scd
Sodium Adsorption Ratio in Water	USGS - 11738-78		2.0						12/07/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	5	52.3		*	mg/L	5	25	12/03/21 12:59	wtc

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 8

ACZ Sample ID: **L69988-03**

Date Sampled: 11/17/21 13:25

Date Received: 11/18/21

Sample Matrix: *Groundwater*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								10/20/21 10:01	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								11/23/21 12:51	kja
Total Hot Plate Digestion	M200.2 ICP								12/01/21 14:50	kja
Total Recoverable Digestion	M200.2 ICP-MS								11/24/21 9:00	mfm
Total Recoverable Digestion	M200.2 ICP								12/01/21 18:41	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.00044	B		mg/L	0.0002	0.001	11/30/21 18:20	bsu
Boron, total	M200.7 ICP	1	<0.03	U		mg/L	0.03	0.1	12/02/21 20:19	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	11/22/21 15:32	kja
Calcium, dissolved	M200.7 ICP	1	103			mg/L	0.1	0.5	11/29/21 16:35	kja
Chromium, total recoverable	M200.8 ICP-MS	1	0.00487			mg/L	0.0005	0.002	11/30/21 18:20	bsu
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	11/22/21 15:32	kja
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	11/29/21 16:35	kja
Iron, total	M200.7 ICP	1	5.79			mg/L	0.06	0.15	12/02/21 20:19	kja
Iron, total recoverable	M200.7 ICP	1	5.63			mg/L	0.06	0.15	12/02/21 17:45	kja
Magnesium, dissolved	M200.7 ICP	1	22.8			mg/L	0.2	1	11/29/21 16:35	kja
Manganese, dissolved	M200.7 ICP	1	0.049	B		mg/L	0.01	0.05	11/29/21 16:35	kja
Manganese, potentially dissolved	M200.7 ICP	1	0.848			mg/L	0.01	0.05	11/22/21 15:32	kja
Manganese, total	M200.7 ICP	1	1.20			mg/L	0.01	0.05	12/02/21 20:19	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/21 15:06	mlh
Potassium, dissolved	M200.7 ICP	1	1.79			mg/L	0.2	1	11/29/21 16:35	kja
Sodium, dissolved	M200.7 ICP	1	149			mg/L	0.2	1	11/29/21 16:35	kja
Zinc, potentially dissolved	M200.7 ICP	1	<0.02	U		mg/L	0.02	0.05	11/22/21 15:32	kja

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 8

ACZ Sample ID: **L69988-03**

Date Sampled: 11/17/21 13:25

Date Received: 11/18/21

Sample Matrix: *Groundwater*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	487			mg/L	2	20	11/24/21 0:00	eep
Carbonate as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Total Alkalinity		1	487			mg/L	2	20	11/24/21 0:00	eep
Cation-Anion Balance	Calculation									
Cation-Anion Balance			0.0			%			12/07/21 0:00	calc
Sum of Anions			14			meq/L			12/07/21 0:00	calc
Sum of Cations			14			meq/L			12/07/21 0:00	calc
Chloride	SM4500Cl-E	1	35.3		*	mg/L	0.5	2	12/01/21 14:30	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		351			mg/L	0.2	5	12/07/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							11/30/21 7:12	mlh
Residue, Filterable (TDS) @180C	SM2540C	1	754		*	mg/L	20	40	11/24/21 11:13	anc
Residue, Non-Filterable (TSS) @105C	SM2540D	1	96.0		*	mg/L	5	20	11/22/21 16:24	scd
Sodium Adsorption Ratio in Water	USGS - 11738-78		3.5						12/07/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	5	135		*	mg/L	5	25	12/03/21 12:59	wtc

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 9

ACZ Sample ID: **L69988-04**

Date Sampled: 11/17/21 13:50

Date Received: 11/18/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								10/20/21 10:06	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								11/23/21 12:51	kja
Total Hot Plate Digestion	M200.2 ICP								12/01/21 15:04	kja
Total Recoverable Digestion	M200.2 ICP-MS								11/24/21 9:00	mfm
Total Recoverable Digestion	M200.2 ICP								12/01/21 18:55	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	<0.0002	U		mg/L	0.0002	0.001	11/30/21 18:21	bsu
Boron, total	M200.7 ICP	1	0.030	B		mg/L	0.03	0.1	12/02/21 20:22	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	11/22/21 15:36	kja
Calcium, dissolved	M200.7 ICP	1	68.7			mg/L	0.1	0.5	11/29/21 16:38	kja
Chromium, total recoverable	M200.8 ICP-MS	1	0.00189	B		mg/L	0.0005	0.002	11/30/21 18:21	bsu
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	11/22/21 15:36	kja
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	11/29/21 16:38	kja
Iron, total	M200.7 ICP	1	0.903			mg/L	0.06	0.15	12/02/21 20:22	kja
Iron, total recoverable	M200.7 ICP	1	0.840			mg/L	0.06	0.15	12/02/21 17:48	kja
Magnesium, dissolved	M200.7 ICP	1	18.3			mg/L	0.2	1	11/29/21 16:38	kja
Manganese, dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	11/29/21 16:38	kja
Manganese, potentially dissolved	M200.7 ICP	1	0.491			mg/L	0.01	0.05	11/22/21 15:36	kja
Manganese, total	M200.7 ICP	1	1.10			mg/L	0.01	0.05	12/02/21 20:22	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/21 15:08	mlh
Potassium, dissolved	M200.7 ICP	1	2.44			mg/L	0.2	1	11/29/21 16:38	kja
Sodium, dissolved	M200.7 ICP	1	123			mg/L	0.2	1	11/29/21 16:38	kja
Zinc, potentially dissolved	M200.7 ICP	1	<0.02	U		mg/L	0.02	0.05	11/22/21 15:36	kja

New Elk Coal Co. , LLC

Project ID:

Sample ID: PAW 9

ACZ Sample ID: **L69988-04**

Date Sampled: 11/17/21 13:50

Date Received: 11/18/21

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	442			mg/L	2	20	11/24/21 0:00	eep
Carbonate as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	11/24/21 0:00	eep
Total Alkalinity		1	442			mg/L	2	20	11/24/21 0:00	eep
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-4.8			%			12/07/21 0:00	calc
Sum of Anions			11.0			meq/L			12/07/21 0:00	calc
Sum of Cations			10			meq/L			12/07/21 0:00	calc
Chloride	SM4500Cl-E	1	17.9		*	mg/L	0.5	2	12/01/21 14:31	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		247			mg/L	0.2	5	12/07/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							11/30/21 7:14	mlh
Residue, Filterable (TDS) @180C	SM2540C	1	578		*	mg/L	20	40	11/24/21 11:16	anc
Residue, Non-Filterable (TSS) @105C	SM2540D	1	14.0	B	*	mg/L	5	20	11/22/21 16:26	scd
Sodium Adsorption Ratio in Water	USGS - 11738-78		3.4						12/07/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	5	77.0		*	mg/L	5	25	12/03/21 13:01	wtc



Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

New Elk Coal Co. , LLC

ACZ Project ID: **L69988**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L69988-01	WG532680	Chloride	SM4500CI-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532278	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG532877	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07/-11 - TURBIDIMETRIC	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532696	Total Hot Plate Digestion	M200.2 ICP	DJ	Sample dilution required due to insufficient sample.
L69988-02	WG532680	Chloride	SM4500CI-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532405	Residue, Filterable (TDS) @180C	SM2540C	N1	See Case Narrative.
	WG532278	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532877	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07/-11 - TURBIDIMETRIC	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532365	Total Alkalinity	SM2320B - Titration	ZW	Method deviation. The sample was centrifuged prior to analysis due to high solid content.
L69988-03	WG532680	Chloride	SM4500CI-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532405	Residue, Filterable (TDS) @180C	SM2540C	N1	See Case Narrative.
	WG532278	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532877	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07/-11 - TURBIDIMETRIC	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L69988-04	WG532680	Chloride	SM4500CI-E	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG532405	Residue, Filterable (TDS) @180C	SM2540C	N1	See Case Narrative.
	WG532278	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG532877	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
			D516-02/-07/-11 - TURBIDIMETRIC	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

New Elk Coal Co. , LLC

ACZ Project ID: **L69988**

No certification qualifiers associated with this analysis

New Elk Coal Co. , LLC

ACZ Project ID: L69988

Date Received: 11/18/2021 10:42

Received By:

Date Printed: 11/19/2021

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?	X		
A change was made in the PO# and # of Containers section prior to ACZ custody.			
A change was made in the PO# and # of Containers section prior to ACZ custody.			
A change was made in the PO# and # of Containers section prior to ACZ custody.			
A change was made in the PO# and # of Containers section prior to ACZ custody.			
A change was made in the PO# and # of Containers section prior to ACZ custody.			

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? ¹	X		
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

New Elk Coal Co. , LLC

ACZ Project ID: L69988

Date Received: 11/18/2021 10:42

Received By:

Date Printed: 11/19/2021

Shipping Containers

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
-----	-----	-----	-----	-----
6511	4.7	<=6.0	15	Yes

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

ACZ**Laboratories, Inc.** L 69988

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY**Report to:**

Name: James F Begano
Company: New Elk Coal Co
E-mail: jimb@newelkcoal.com

Address: 12250 State Hwy 12
Weston CO 81091
Telephone: 719-631-6143

Copy of Report to:

Name: Nick Mason
Company: New Elk Coal Co.

E-mail: nmason@newelkcoal.com
Telephone: 719-631-6146

Invoice to:

Name: Mary Head
Company: New Elk Coal Co.
E-mail: mary@newelkcoal.com

Address: 12250 State Hwy 12
Weston, CO 81091
Telephone: 719-631-6142

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES ☒
NO ☐

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring?

Yes ☐ No ☒

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: _____ Sampler's Site Information State Colo. Zip code 81091 Time Zone MDT

*Sampler's Signature: _____

*I attest to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote # Table 28-GW-QTR

PO#: GWQB

Reporting state for compliance testing:

Check box if samples include NRC licensed material? ☐

SAMPLE IDENTIFICATION **DATE:TIME** **Matrix**

PAW 1 11/17/21 12:45 GW

PAW 2 11/17/21 13:00 GW

PAW 8 11/17/21 13:25 GW

PAW 9 11/17/21 13:50 GW

of Containers

Table 28-GW-QTR

Matrix

SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please Return: Cooler
SAMPLE Bottles
Ice Bottles
Paper work

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

James F Begano

11/17/21 15:15

[Signature]

11/18/21 1042

December 15, 2021

Report to:

Jim Begano
New Elk Coal Co. , LLC
12250 Hwy. 12
Weston, CO 81091

Bill to:

Mary Head
New Elk Coal Co. , LLC
12250 US HWY 12
Weston, CO 81091

cc: Nick Mason

Project ID:

ACZ Project ID: L70198

Jim Begano:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 02, 2021. This project has been assigned to ACZ's project number, L70198. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L70198. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 14, 2022. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and
approved this report.



New Elk Coal Co. , LLC

Project ID:

Sample ID: NEW 4

ACZ Sample ID: **L70198-01**

Date Sampled: 12/01/21 12:36

Date Received: 12/02/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/05/21 9:13	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								12/08/21 12:09	mlh
Total Hot Plate Digestion	M200.2 ICP								12/09/21 16:21	aeH
Total Recoverable Digestion	M200.2 ICP-MS								12/08/21 18:00	mfm
Total Recoverable Digestion	M200.2 ICP								12/08/21 19:37	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	<0.0002	U		mg/L	0.0002	0.001	12/10/21 14:35	mfm
Boron, total	M200.7 ICP	1	<0.03	U		mg/L	0.03	0.1	12/11/21 0:14	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	12/06/21 18:57	jlw
Calcium, dissolved	M200.7 ICP	1	5.39			mg/L	0.1	0.5	12/09/21 16:00	kja
Chromium, total recoverable	M200.8 ICP-MS	1	0.00123	B		mg/L	0.0005	0.002	12/10/21 14:35	mfm
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/06/21 18:57	jlw
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	12/09/21 16:00	kja
Iron, total	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	12/11/21 0:14	kja
Iron, total recoverable	M200.7 ICP	1	0.129	B		mg/L	0.06	0.15	12/09/21 21:03	kja
Magnesium, dissolved	M200.7 ICP	1	2.75			mg/L	0.2	1	12/09/21 16:00	kja
Manganese, dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/09/21 16:00	kja
Manganese, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/06/21 18:57	jlw
Manganese, total	M200.7 ICP	1	0.011	B		mg/L	0.01	0.05	12/11/21 0:14	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	12/07/21 15:48	mlh
Potassium, dissolved	M200.7 ICP	1	5.32			mg/L	0.2	1	12/09/21 16:00	kja
Sodium, dissolved	M200.7 ICP	1	526			mg/L	0.2	1	12/09/21 16:00	kja
Zinc, potentially dissolved	M200.7 ICP	1	<0.02	U		mg/L	0.02	0.05	12/06/21 18:57	jlw

New Elk Coal Co. , LLC

Project ID:

Sample ID: NEW 4

ACZ Sample ID: **L70198-01**

Date Sampled: 12/01/21 12:36

Date Received: 12/02/21

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	1180			mg/L	2	20	12/07/21 0:00	jck
Carbonate as CaCO ₃		1	89.5			mg/L	2	20	12/07/21 0:00	jck
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	12/07/21 0:00	jck
Total Alkalinity		1	1270			mg/L	2	20	12/07/21 0:00	jck
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-4.0			%			12/15/21 0:00	calc
Sum of Anions			26			meq/L			12/15/21 0:00	calc
Sum of Cations			24			meq/L			12/15/21 0:00	calc
Chloride	SM4500Cl-E	1	11.5		*	mg/L	0.5	2	12/13/21 14:57	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		25			mg/L	0.2	5	12/15/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/06/21 12:16	mlh
Residue, Filterable (TDS) @180C	SM2540C	1	1400			mg/L	20	40	12/03/21 11:21	scd
Residue, Non-Filterable (TSS) @105C	SM2540D	1	<5	U	*	mg/L	5	20	12/07/21 13:17	anc
Sodium Adsorption Ratio in Water	USGS - 11738-78		47						12/15/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	1	19.0		*	mg/L	1	5	12/08/21 21:31	mjj1

New Elk Coal Co. , LLC

Project ID:

Sample ID: NE-1-10

ACZ Sample ID: **L70198-02**

Date Sampled: 12/01/21 13:10

Date Received: 12/02/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/05/21 9:21	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								12/08/21 12:09	mlh
Total Hot Plate Digestion	M200.2 ICP								12/09/21 16:35	aeH
Total Recoverable Digestion	M200.2 ICP-MS								12/08/21 18:00	mfm
Total Recoverable Digestion	M200.2 ICP								12/08/21 20:19	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.0117			mg/L	0.0002	0.001	12/10/21 14:37	mfm
Boron, total	M200.7 ICP	1	<0.03	U		mg/L	0.03	0.1	12/11/21 0:17	kja
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	12/06/21 19:01	jlw
Calcium, dissolved	M200.7 ICP	1	2.32			mg/L	0.1	0.5	12/09/21 16:09	kja
Chromium, total recoverable	M200.8 ICP-MS	1	0.00261			mg/L	0.0005	0.002	12/10/21 14:37	mfm
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/06/21 19:01	jlw
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	12/09/21 16:09	kja
Iron, total	M200.7 ICP	1	0.178			mg/L	0.06	0.15	12/11/21 0:17	kja
Iron, total recoverable	M200.7 ICP	1	0.220			mg/L	0.06	0.15	12/09/21 21:13	kja
Magnesium, dissolved	M200.7 ICP	1	2.54			mg/L	0.2	1	12/09/21 16:09	kja
Manganese, dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/09/21 16:09	kja
Manganese, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/06/21 19:01	jlw
Manganese, total	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/11/21 0:17	kja
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	12/07/21 15:49	mlh
Potassium, dissolved	M200.7 ICP	1	4.12			mg/L	0.2	1	12/09/21 16:09	kja
Sodium, dissolved	M200.7 ICP	1	304			mg/L	0.2	1	12/09/21 16:09	kja
Zinc, potentially dissolved	M200.7 ICP	1	<0.02	U		mg/L	0.02	0.05	12/06/21 19:01	jlw

New Elk Coal Co. , LLC

Project ID:

Sample ID: NE-1-10

ACZ Sample ID: **L70198-02**

Date Sampled: 12/01/21 13:10

Date Received: 12/02/21

Sample Matrix: *Groundwater*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	404			mg/L	2	20	12/07/21 0:00	jck
Carbonate as CaCO ₃		1	323			mg/L	2	20	12/07/21 0:00	jck
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	12/07/21 0:00	jck
Total Alkalinity		1	727			mg/L	2	20	12/07/21 0:00	jck
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-3.4			%			12/15/21 0:00	calc
Sum of Anions			15			meq/L			12/15/21 0:00	calc
Sum of Cations			14			meq/L			12/15/21 0:00	calc
Chloride	SM4500Cl-E	1	7.14		*	mg/L	0.5	2	12/13/21 14:57	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		16			mg/L	0.2	5	12/15/21 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/06/21 12:28	mlh
Residue, Filterable (TDS) @180C	SM2540C	1	826			mg/L	20	40	12/03/21 11:22	scd
Residue, Non-Filterable (TSS) @105C	SM2540D	1	5.0	B	*	mg/L	5	20	12/07/21 13:20	anc
Sodium Adsorption Ratio in Water	USGS - 11738-78		33						12/15/21 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	1	21.0		*	mg/L	1	5	12/08/21 21:33	mjj1


Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

New Elk Coal Co. , LLC

ACZ Project ID: **L70198**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L70198-01	WG533446	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG533080	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG533214	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
L70198-02	WG533446	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG533080	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG533214	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.

New Elk Coal Co. , LLC

ACZ Project ID: **L70198**

No certification qualifiers associated with this analysis

New Elk Coal Co. , LLC

ACZ Project ID: L70198

Date Received: 12/02/2021 11:58

Received By:

Date Printed: 12/3/2021

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody form or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☒	☐
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody form complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☒	☐	☐
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
-----	-----	-----	-----	-----
5316	1	<=6.0	15	Yes

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

New Elk Coal Co. , LLC

ACZ Project ID: L70198

Date Received: 12/02/2021 11:58

Received By:

Date Printed: 12/3/2021

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).



Laboratories, Inc.

L70198

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Jim Begano
 Company: New Elk Coal Co.
 E-mail: jimb@newelkcoal.com

Address: 12250 State Hwy 12
Weston, Colo. 81091
 Telephone: 719-631-6143

Copy of Report to:

Name: Nick Mason
 Company: New Elk Coal Co.

E-mail: nmason@newelkcoal.com
 Telephone: 719-631-6146

Invoice to:

Name: Mary Head
 Company: New Elk Coal Co.
 E-mail: mary@newelkcoal.com

Address: 12250 State Hwy 12
Weston, Colo 81091
 Telephone: 719-631-6142

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES ☒
 NO ☐

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring?

Yes ☐ No ☒

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Jim Begano Sampler's Site Information State Colo Zip code 81091 Time Zone MDT

*Sampler's Signature: Jim Begano

*I attest to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Table 28-GW-QTR

PO#:

Reporting state for compliance testing:

Check box if samples include NRC licensed material? ☐

SAMPLE IDENTIFICATION DATE:TIME Matrix

NEW 4 12-1-21 12:36 GW 6

NE-1-10 12-1-21 13:10 GW 6

of Containers

Table 28-GW-QTR

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please Return: Cooler
 Sample Bottles
 Paper work
 Ice Bottles

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

James F. Begano

12/1/21 15:10

MM

12/2/21

11:58



L70198 Chain of Custody

January 10, 2022

Report to:

Jim Begano
New Elk Coal Co. , LLC
12250 Hwy. 12
Weston, CO 81091

Bill to:

Mary Head
New Elk Coal Co. , LLC
12250 US HWY 12
Weston, CO 81091

cc: Nick Mason

Project ID:

ACZ Project ID: L70567

Jim Begano:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 17, 2021. This project has been assigned to ACZ's project number, L70567. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L70567. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 09, 2022. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and
approved this report.



New Elk Coal Co. , LLC

Project ID:

Sample ID: NE-6-10-A

ACZ Sample ID: **L70567-01**

Date Sampled: 12/16/21 12:30

Date Received: 12/17/21

Sample Matrix: *Groundwater*

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/19/21 9:58	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								12/21/21 8:20	mlh
Total Hot Plate Digestion	M200.2 ICP								12/29/21 12:57	kja
Total Recoverable Digestion	M200.2 ICP-MS								12/30/21 10:40	mfm/sc p
Total Recoverable Digestion	M200.2 ICP								12/21/21 17:49	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.00043	B		mg/L	0.0002	0.001	01/05/22 16:44	scp
Boron, total	M200.7 ICP	1	0.081	B		mg/L	0.03	0.1	12/22/21 15:18	jlw
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	12/20/21 18:32	kja
Calcium, dissolved	M200.7 ICP	1	2.55			mg/L	0.1	0.5	12/30/21 13:12	jlw
Chromium, total recoverable	M200.8 ICP-MS	1	0.00110	B		mg/L	0.0005	0.002	01/05/22 16:44	scp
Copper, potentially dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/20/21 18:32	kja
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	12/30/21 13:12	jlw
Iron, total	M200.7 ICP	1	0.393			mg/L	0.06	0.15	12/30/21 10:21	kja
Iron, total recoverable	M200.7 ICP	1	0.426			mg/L	0.06	0.15	12/22/21 18:00	kja
Magnesium, dissolved	M200.7 ICP	1	0.82	B		mg/L	0.2	1	12/30/21 13:12	jlw
Manganese, dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/30/21 13:12	jlw
Manganese, potentially dissolved	M200.7 ICP	1	0.019	B		mg/L	0.01	0.05	12/20/21 18:32	kja
Manganese, total	M200.7 ICP	1	0.013	B		mg/L	0.01	0.05	12/22/21 15:18	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	12/31/21 11:02	mlh
Potassium, dissolved	M200.7 ICP	1	2.89			mg/L	0.2	1	12/30/21 13:12	jlw
Sodium, dissolved	M200.7 ICP	1	417		*	mg/L	0.2	1	12/30/21 13:12	jlw
Zinc, potentially dissolved	M200.7 ICP	1	<0.02	U		mg/L	0.02	0.05	12/20/21 18:32	kja

New Elk Coal Co. , LLC

Project ID:

Sample ID: NE-6-10-A

ACZ Sample ID: **L70567-01**

Date Sampled: 12/16/21 12:30

Date Received: 12/17/21

Sample Matrix: *Groundwater*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	938			mg/L	2	20	12/30/21 0:00	emk
Carbonate as CaCO ₃		1	136			mg/L	2	20	12/30/21 0:00	emk
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	12/30/21 0:00	emk
Total Alkalinity		1	1070			mg/L	2	20	12/30/21 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-7.3			%			01/10/22 0:00	calc
Sum of Anions			22			meq/L			01/10/22 0:00	calc
Sum of Cations			19			meq/L			01/10/22 0:00	calc
Chloride	SM4500Cl-E	1	5.47			mg/L	0.5	2	01/07/22 12:54	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		9.7			mg/L	0.2	5	01/10/22 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/30/21 15:45	emk
Residue, Filterable (TDS) @180C	SM2540C	2	1100			mg/L	40	80	12/21/21 19:20	jck
Residue, Non-Filterable (TSS) @105C	SM2540D	1	13.0	B	*	mg/L	5	20	12/20/21 15:17	scd
Sodium Adsorption Ratio in Water	USGS - 11738-78		59						01/10/22 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	1	1.8	B	*	mg/L	1	5	01/07/22 19:03	syw

New Elk Coal Co. , LLC

Project ID:

Sample ID: NE-6-10-B

ACZ Sample ID: **L70567-02**

Date Sampled: 12/16/21 13:04

Date Received: 12/17/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/19/21 10:08	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								12/21/21 8:20	mlh
Total Hot Plate Digestion	M200.2 ICP				*				12/29/21 13:10	kja
Total Recoverable Digestion	M200.2 ICP								12/21/21 18:14	kja
Total Recoverable Digestion	M200.2 ICP-MS								12/30/21 10:51	mfm/sc p

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.00065	B		mg/L	0.0002	0.001	01/05/22 16:46	scp
Boron, total	M200.7 ICP	1	0.062	B		mg/L	0.03	0.1	12/22/21 15:21	jlw
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	12/20/21 18:47	kja
Calcium, dissolved	M200.7 ICP	1	2.43			mg/L	0.1	0.5	12/30/21 13:15	jlw
Chromium, total recoverable	M200.8 ICP-MS	1	0.0162			mg/L	0.0005	0.002	01/05/22 16:46	scp
Copper, potentially dissolved	M200.7 ICP	1	0.018	B		mg/L	0.01	0.05	12/20/21 18:47	kja
Iron, dissolved	M200.7 ICP	1	0.161			mg/L	0.06	0.15	12/30/21 13:15	jlw
Iron, total	M200.7 ICP	2	1.81			mg/L	0.12	0.3	12/30/21 10:25	kja
Iron, total recoverable	M200.7 ICP	1	1.79			mg/L	0.06	0.15	12/22/21 18:03	kja
Magnesium, dissolved	M200.7 ICP	1	0.31	B		mg/L	0.2	1	12/30/21 13:15	jlw
Manganese, dissolved	M200.7 ICP	1	0.017	B		mg/L	0.01	0.05	12/30/21 13:15	jlw
Manganese, potentially dissolved	M200.7 ICP	1	0.030	B		mg/L	0.01	0.05	12/20/21 18:47	kja
Manganese, total	M200.7 ICP	1	0.034	B		mg/L	0.01	0.05	12/22/21 15:21	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	12/31/21 11:02	mlh
Potassium, dissolved	M200.7 ICP	1	1.42			mg/L	0.2	1	12/30/21 13:15	jlw
Sodium, dissolved	M200.7 ICP	1	189		*	mg/L	0.2	1	12/30/21 13:15	jlw
Zinc, potentially dissolved	M200.7 ICP	1	0.031	B		mg/L	0.02	0.05	12/20/21 18:47	kja

New Elk Coal Co. , LLC

Project ID:

Sample ID: NE-6-10-B

ACZ Sample ID: **L70567-02**

Date Sampled: 12/16/21 13:04

Date Received: 12/17/21

Sample Matrix: *Groundwater*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	458			mg/L	2	20	12/30/21 0:00	emk
Carbonate as CaCO ₃		1	17.7	B		mg/L	2	20	12/30/21 0:00	emk
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	12/30/21 0:00	emk
Total Alkalinity		1	476			mg/L	2	20	12/30/21 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-7.6			%			01/10/22 0:00	calc
Sum of Anions			9.9			meq/L			01/10/22 0:00	calc
Sum of Cations			8.5			meq/L			01/10/22 0:00	calc
Chloride	SM4500Cl-E	1	5.29			mg/L	0.5	2	01/07/22 12:55	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		7.3			mg/L	0.2	5	01/10/22 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/30/21 15:46	emk
Residue, Filterable (TDS) @180C	SM2540C	1	510			mg/L	20	40	12/21/21 19:23	jck
Residue, Non-Filterable (TSS) @105C	SM2540D	1	26.0		*	mg/L	5	20	12/20/21 15:19	scd
Sodium Adsorption Ratio in Water	USGS - 11738-78		31						01/10/22 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	1	13.3		*	mg/L	1	5	01/07/22 19:06	syw

New Elk Coal Co. , LLC

Project ID:

Sample ID: NEW 2

ACZ Sample ID: **L70567-03**

Date Sampled: 12/16/21 13:46

Date Received: 12/17/21

Sample Matrix: Groundwater

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Acidify and filter (Potentially Dissolved)	Colorado 5 CCR 1002-31.5.31 (2009)								12/19/21 10:19	ssr
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								12/28/21 18:38	kja
Total Hot Plate Digestion	M200.2 ICP								12/29/21 13:52	kja
Total Recoverable Digestion	M200.2 ICP-MS								12/30/21 11:02	mfm/sc p
Total Recoverable Digestion	M200.2 ICP								12/21/21 18:39	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Arsenic, total recoverable	M200.8 ICP-MS	1	0.00052	B		mg/L	0.0002	0.001	01/05/22 16:48	scp
Boron, total	M200.7 ICP	1	0.047	B		mg/L	0.03	0.1	12/22/21 15:25	jlw
Cadmium, potentially dissolved	M200.7 ICP	1	<0.008	U		mg/L	0.008	0.025	12/20/21 18:51	kja
Calcium, dissolved	M200.7 ICP	1	11.4			mg/L	0.1	0.5	12/30/21 13:18	jlw
Chromium, total recoverable	M200.8 ICP-MS	1	0.00084	B		mg/L	0.0005	0.002	01/05/22 16:48	scp
Copper, potentially dissolved	M200.7 ICP	1	0.029	B		mg/L	0.01	0.05	12/20/21 18:51	kja
Iron, dissolved	M200.7 ICP	1	0.130	B		mg/L	0.06	0.15	12/30/21 13:18	jlw
Iron, total	M200.7 ICP	1	0.939			mg/L	0.06	0.15	12/30/21 10:34	kja
Iron, total recoverable	M200.7 ICP	1	0.879			mg/L	0.06	0.15	12/22/21 18:06	kja
Magnesium, dissolved	M200.7 ICP	1	5.01			mg/L	0.2	1	12/30/21 13:18	jlw
Manganese, dissolved	M200.7 ICP	1	0.017	B		mg/L	0.01	0.05	12/30/21 13:18	jlw
Manganese, potentially dissolved	M200.7 ICP	1	0.054			mg/L	0.01	0.05	12/20/21 18:51	kja
Manganese, total	M200.7 ICP	1	0.052			mg/L	0.01	0.05	12/22/21 15:25	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	12/31/21 11:03	mlh
Potassium, dissolved	M200.7 ICP	1	6.98			mg/L	0.2	1	12/30/21 13:18	jlw
Sodium, dissolved	M200.7 ICP	1	487		*	mg/L	0.2	1	12/30/21 13:18	jlw
Zinc, potentially dissolved	M200.7 ICP	1	0.035	B		mg/L	0.02	0.05	12/20/21 18:51	kja

New Elk Coal Co. , LLC

Project ID:

Sample ID: NEW 2

ACZ Sample ID: **L70567-03**

Date Sampled: 12/16/21 13:46

Date Received: 12/17/21

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO ₃	SM2320B - Titration									
Bicarbonate as CaCO ₃		1	1070			mg/L	2	20	12/30/21 0:00	emk
Carbonate as CaCO ₃		1	54.0			mg/L	2	20	12/30/21 0:00	emk
Hydroxide as CaCO ₃		1	<2	U		mg/L	2	20	12/30/21 0:00	emk
Total Alkalinity		1	1130			mg/L	2	20	12/30/21 0:00	emk
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-6.1			%			01/10/22 0:00	calc
Sum of Anions			26			meq/L			01/10/22 0:00	calc
Sum of Cations			23			meq/L			01/10/22 0:00	calc
Chloride	SM4500Cl-E	1	9.07			mg/L	0.5	2	01/07/22 12:55	md
Hardness as CaCO ₃ (dissolved)	SM2340B - Calculation		49			mg/L	0.2	5	01/10/22 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/30/21 15:48	emk
Residue, Filterable (TDS) @180C	SM2540C	1	1360			mg/L	20	40	12/21/21 19:25	jck
Residue, Non-Filterable (TSS) @105C	SM2540D	1	<5	U	*	mg/L	5	20	12/20/21 15:21	scd
Sodium Adsorption Ratio in Water	USGS - 11738-78		31						01/10/22 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	5	143		*	mg/L	5	25	01/07/22 19:13	syw



Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

New Elk Coal Co. , LLC

ACZ Project ID: **L70567**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L70567-01	WG533936	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534631	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L70567-02	WG533936	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534631	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534202	Total Hot Plate Digestion	M200.2 ICP	DJ	Sample dilution required due to insufficient sample.
L70567-03	WG533936	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534631	Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.

New Elk Coal Co. , LLC

ACZ Project ID: **L70567**

No certification qualifiers associated with this analysis

New Elk Coal Co. , LLC

ACZ Project ID: L70567

Date Received: 12/17/2021 13:10

Received By:

Date Printed: 12/20/2021

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody form or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☒	☐
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody form complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☒	☐	☐
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
7044	1.1	<=6.0	15	Yes

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

New Elk Coal Co. , LLC

ACZ Project ID: L70567

Date Received: 12/17/2021 13:10

Received By:

Date Printed: 12/20/2021

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

**Laboratories, Inc.**

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

L70567

CHAIN of CUSTODY**Report to:**

Name: James F. Begano
Company: NEW EIK Coal Co
E-mail: jimb@newelkcoal.com

Address: 12250 State Hwy 12
Weston, CO 81091
Telephone: 719-631-6143

Copy of Report to:

Name: Nick Mason
Company: New EIK Coal Co.

E-mail: nmason@newelkcoal.com
Telephone: 719-631-6146

Invoice to:

Name: Mary Head
Company: New EIK Coal Co.
E-mail: mary@newelkcoal.com

Address: 12250 State Hwy 12
Weston, CO 81091
Telephone: 719-631-6141

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES ☒
NO ☐

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring?

Yes ☐ No ☒

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: JB Sampler's Site Information State CO Zip code 81091 Time Zone MST

*Sampler's Signature: James Begano

I attest to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Quote #: Table-28-GW-QTR

PO#:

Reporting state for compliance testing:

Check box if samples include NRC licensed material? ☐

SAMPLE IDENTIFICATION DATE:TIME Matrix

NE-6-10-A 12/16/21 12:30 GW

NE-6-10-B 12/16/21 13:04 GW

NEW 2 12/16/21 13:46 6

of Containers

Table-28-GW-QTR

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please Return: Cooler
Ice Containers
Paper work
Sample Bottles

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

James F. Begano

12/16/21 15:20

JH

12/17/21 13:10

January 10, 2022

Report to:

Jim Begano
New Elk Coal Co. , LLC
12250 Hwy. 12
Weston, CO 81091

Bill to:

Mary Head
New Elk Coal Co. , LLC
12250 US HWY 12
Weston, CO 81091

cc: Nick Mason

Project ID:

ACZ Project ID: L70608

Jim Begano:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 21, 2021. This project has been assigned to ACZ's project number, L70608. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L70608. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 09, 2022. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Sue Webber has reviewed and approved this report.



New Elk Coal Co. , LLC

Project ID:

Sample ID: PRS-1

ACZ Sample ID: **L70608-01**

Date Sampled: 12/20/21 14:00

Date Received: 12/21/21

Sample Matrix: Surface Water

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								12/28/21 18:38	kja
Total Hot Plate Digestion	M200.2 ICP								12/28/21 14:39	jlw
Total Recoverable Digestion	M200.2 ICP								12/22/21 19:11	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	48.3			mg/L	0.1	0.5	12/30/21 13:40	jlw
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	12/30/21 13:40	jlw
Iron, total	M200.7 ICP	1	0.161			mg/L	0.06	0.15	12/29/21 10:26	jlw
Iron, total recoverable	M200.7 ICP	1	0.165			mg/L	0.06	0.15	12/29/21 1:07	kja
Magnesium, dissolved	M200.7 ICP	1	8.00			mg/L	0.2	1	12/30/21 13:40	jlw
Manganese, dissolved	M200.7 ICP	1	<0.01	U		mg/L	0.01	0.05	12/30/21 13:40	jlw
Manganese, total	M200.7 ICP	1	0.023	B		mg/L	0.01	0.05	12/29/21 10:26	jlw
Potassium, dissolved	M200.7 ICP	1	1.54			mg/L	0.2	1	12/30/21 13:40	jlw
Sodium, dissolved	M200.7 ICP	1	6.99		*	mg/L	0.2	1	12/30/21 13:40	jlw

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	136			mg/L	2	20	12/30/21 0:00	emk
Carbonate as CaCO3		1	<2	U		mg/L	2	20	12/30/21 0:00	emk
Hydroxide as CaCO3		1	<2	U		mg/L	2	20	12/30/21 0:00	emk
Total Alkalinity		1	136			mg/L	2	20	12/30/21 0:00	emk
Chloride	SM4500Cl-E	1	2.19		*	mg/L	0.5	2	01/10/22 9:34	md
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		154			mg/L	0.2	5	01/10/22 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/30/21 16:30	emk
Residue, Filterable (TDS) @180C	SM2540C	1	216			mg/L	20	40	12/22/21 13:48	anc
Residue, Non-Filterable (TSS) @105C	SM2540D	1	<5	U	*	mg/L	5	20	12/22/21 19:24	jck
Sodium Adsorption Ratio in Water	USGS - 11738-78		0.25						01/10/22 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	5	40.2		*	mg/L	5	25	01/08/22 10:49	syw

New Elk Coal Co. , LLC

Project ID:

Sample ID: PRS-4A

ACZ Sample ID: **L70608-02**

Date Sampled: 12/20/21 14:32

Date Received: 12/21/21

Sample Matrix: Surface Water

Inorganic Prep

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Lab Filtration (0.45um) & Acidification	M200.7/200.8/3005A								12/28/21 18:38	kja
Total Hot Plate Digestion	M200.2 ICP								12/28/21 14:53	jlw
Total Recoverable Digestion	M200.2 ICP								12/22/21 19:57	kja

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	49.0			mg/L	0.1	0.5	12/30/21 13:43	jlw
Iron, dissolved	M200.7 ICP	1	<0.06	U		mg/L	0.06	0.15	12/30/21 13:43	jlw
Iron, total	M200.7 ICP	1	0.313			mg/L	0.06	0.15	12/29/21 10:29	jlw
Iron, total recoverable	M200.7 ICP	1	0.259			mg/L	0.06	0.15	12/29/21 1:16	kja
Magnesium, dissolved	M200.7 ICP	1	8.15			mg/L	0.2	1	12/30/21 13:43	jlw
Manganese, dissolved	M200.7 ICP	1	0.011	B		mg/L	0.01	0.05	12/30/21 13:43	jlw
Manganese, total	M200.7 ICP	1	0.034	B		mg/L	0.01	0.05	12/29/21 10:29	jlw
Potassium, dissolved	M200.7 ICP	1	1.50			mg/L	0.2	1	12/30/21 13:43	jlw
Sodium, dissolved	M200.7 ICP	1	7.55		*	mg/L	0.2	1	12/30/21 13:43	jlw

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	137			mg/L	2	20	12/30/21 0:00	emk
Carbonate as CaCO3		1	4.3	B		mg/L	2	20	12/30/21 0:00	emk
Hydroxide as CaCO3		1	<2	U		mg/L	2	20	12/30/21 0:00	emk
Total Alkalinity		1	141			mg/L	2	20	12/30/21 0:00	emk
Chloride	SM4500Cl-E	1	2.31		*	mg/L	0.5	2	01/10/22 9:35	md
Hardness as CaCO3 (dissolved)	SM2340B - Calculation		156			mg/L	0.2	5	01/10/22 0:00	calc
Lab Filtration (0.45um filter)	SOPWC050	1							12/30/21 16:32	emk
Residue, Filterable (TDS) @180C	SM2540C	1	216			mg/L	20	40	12/22/21 13:50	anc
Residue, Non-Filterable (TSS) @105C	SM2540D	1	5.0	B	*	mg/L	5	20	12/22/21 19:26	jck
Sodium Adsorption Ratio in Water	USGS - 11738-78		0.27						01/10/22 0:00	calc
Sulfate	D516-02/-07/-11 - TURBIDIMETRIC	5	41.2		*	mg/L	5	25	01/08/22 10:49	syw



Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(4)	EPA SW-846. Test Methods for Evaluating Solid Waste.
(5)	Standard Methods for the Examination of Water and Wastewater.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
(5)	If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

New Elk Coal Co. , LLC

ACZ Project ID: **L70608**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L70608-01	WG534672	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534119	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
				M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L70608-02	WG534672	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534119	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
				M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L70608-01	WG534672	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534119	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
				M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L70608-02	WG534672	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534119	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
				M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L70608-01	WG534672	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534119	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
				M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L70608-02	WG534672	Chloride	SM4500CI-E	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG534119	Residue, Non-Filterable (TSS) @105C	SM2540D	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
			SM2540D	Z3	Sample volume yielded a residue less than 2.5 mg
	WG534283	Sodium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
				M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.

New Elk Coal Co. , LLC

ACZ Project ID: **L70608**

No certification qualifiers associated with this analysis

New Elk Coal Co. , LLC

ACZ Project ID: L70608

Date Received: 12/21/2021 11:38

Received By:

Date Printed: 12/22/2021

Receipt Verification

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?	☐	☐	☒
2) Is the Chain of Custody form or other directive shipping papers present?	☒	☐	☐
3) Does this project require special handling procedures such as CLP protocol?	☐	☒	☐
4) Are any samples NRC licensable material?	☐	☐	☒
5) If samples are received past hold time, proceed with requested short hold time analyses?	☒	☐	☐
6) Is the Chain of Custody form complete and accurate?	☒	☐	☐
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?	☐	☒	☐

Samples/Containers

	YES	NO	NA
8) Are all containers intact and with no leaks?	☒	☐	☐
9) Are all labels on containers and are they intact and legible?	☒	☐	☐
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	☒	☐	☐
11) For preserved bottle types, was the pH checked and within limits? ¹	☒	☐	☐
12) Is there sufficient sample volume to perform all requested work?	☒	☐	☐
13) Is the custody seal intact on all containers?	☐	☐	☒
14) Are samples that require zero headspace acceptable?	☐	☐	☒
15) Are all sample containers appropriate for analytical requirements?	☒	☐	☐
16) Is there an Hg-1631 trip blank present?	☐	☐	☒
17) Is there a VOA trip blank present?	☐	☐	☒
18) Were all samples received within hold time?	☒	☐	☐

NA indicates Not Applicable

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
-----	-----	-----	-----	-----
6624	3.3	<=6.0	15	Yes

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

New Elk Coal Co. , LLC

ACZ Project ID: L70608

Date Received: 12/21/2021 11:38

Received By:

Date Printed: 12/22/2021

¹ The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na₂S₂O₃ preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: <u>Jim Begano</u>	Address: <u>12250 State Hwy 12</u>
Company: <u>New Elk Coal Co.</u>	<u>Weston, CO 81091</u>
E-mail: <u>jimb@newelkcoal.com</u>	Telephone: <u>719-631-6143</u>

Copy of Report to:

Name: Nick Mason	E-mail: nmason@newelkcoal.com
Company: New Elk Coal Co.	Telephone: 719-631-6146

Invoice to:

Name: Mary Hood	Address: 12250 State Hwy 12
Company: New Elk Coal Co	Weston, CO 81091
E-mail: mary@newelkcoal.com	Telephone: 719-631-6141

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?

YES	☒
NO	☐

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for SDWA Compliance Monitoring?

Yes

No

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: Wine Mossaugh Sampler's Site Information State Colo Zip code 81091 Time Zone MST

*Sampler's Signature: Vernice

*I attest to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

[illegible]

Matrix SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other (Specify)

REMARKS

Please Return: Sample Bottles
Cooler
Ice Bottles
Paper work

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

Kirby Hossain	12/22/21 2:00pm	MCT	12/22/21
Kiran Hossain	12/22/21 2:50pm		1138