ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

May 06, 2022

Report to:
Kent Applegate
Rio Algom Mining Company
P.O. Box 218
Grants, NM 87020

Bill to:
Accounts Payable
Rio Algom Mining Company
P.O. Box 218
Grants, NM 87020

cc: Michaella Gorospe, jcarroll, Jeremy Scott Collyard, Marcus Powell, Sharon Clouse, Drew Werth, Casandra Woodward, Shubhangi Agarwal, Anupama Subbakrishna, Revathi Ekambaram, Clark Short, Angela Pe

Project ID: 4512060294
ACZ Project ID: L72106

Kent Applegate:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on March 22, 2022. This project has been assigned to ACZ's project number, L72106. 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 L72106. 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 June 05, 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.

Mark McNeal has reviewed
and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Case Narrative

Rio Algom Mining Company

May 06, 2022

Project ID: 4512060294
ACZ Project ID: L72106

Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 1 groundwater sample from Rio Algom Mining Company on March 22, 2022. The sample was received in good condition. Upon receipt, the sample custodian removed the sample from the cooler, inspected the contents, and logged the sample into ACZ's computerized Laboratory Information Management System (LIMS). The sample was assigned ACZ LIMS project number L72106. 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

This sample was analyzed for inorganic, radiochemistry parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The extended qualifier reports may contain footnotes qualifying specific elements due to QC failures. In addition the following has been noted with this specific project:

1. Throium-230 was subcontracted to ALS-Fort Collins and the report summary is attached.

2. Qualifier: (N1) Applies to: L72106-01 TOTAL DISSOLVED SOLIDS

On 3/28/22 the time and temperature of the 180'C oven was not recorded when the workgroup was removed from the oven. It is believed that the workgroup was in the oven for a minimum of one hour and removed when the oven was in range. Associated quality control within limits. Reanalyze at client request.

Rio Algom Mining Company
Project ID: 4512060294
Sample ID: 30-07 KD-03192022

ACZ Sample ID: ***L72106-01***
Date Sampled: *03/19/22 15:00*
Date Received: *03/22/22*
Sample Matrix: *Groundwater*

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	5	<0.25	U		mg/L	0.25	1.25	04/05/22 13:52	wtc
Antimony, dissolved	M200.8 ICP-MS	5	<0.002	U		mg/L	0.002	0.01	04/05/22 17:48	mfm
Arsenic, dissolved	M200.8 ICP-MS	5	0.00218	B		mg/L	0.001	0.005	04/05/22 17:48	mfm
Barium, dissolved	M200.7 ICP	5	<0.035	U		mg/L	0.035	0.175	04/05/22 13:52	wtc
Beryllium, dissolved	M200.8 ICP-MS	5	<0.0004	U		mg/L	0.0004	0.00125	04/05/22 17:48	mfm
Boron, dissolved	M200.7 ICP	5	0.171	B		mg/L	0.15	0.5	04/05/22 13:52	wtc
Cadmium, dissolved	M200.8 ICP-MS	5	<0.00025	U		mg/L	0.00025	0.00125	04/05/22 17:48	mfm
Calcium, dissolved	M200.7 ICP	5	583			mg/L	0.5	2.5	04/05/22 13:52	wtc
Chromium, dissolved	M200.8 ICP-MS	5	<0.0025	U		mg/L	0.0025	0.01	04/05/22 17:48	mfm
Cobalt, dissolved	M200.7 ICP	5	<0.1	U		mg/L	0.1	0.25	04/05/22 13:52	wtc
Copper, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	04/05/22 13:52	wtc
Iron, dissolved	M200.7 ICP	5	0.732	B		mg/L	0.3	0.75	04/05/22 13:52	wtc
Lead, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	04/05/22 17:48	mfm
Magnesium, dissolved	M200.7 ICP	5	135			mg/L	1	5	04/05/22 13:52	wtc
Manganese, dissolved	M200.7 ICP	5	2.10			mg/L	0.05	0.25	04/05/22 13:52	wtc
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	03/31/22 10:27	mlh
Molybdenum, dissolved	M200.8 ICP-MS	5	0.00675			mg/L	0.001	0.0025	04/05/22 17:48	mfm
Nickel, dissolved	M200.8 ICP-MS	5	<0.002	U		mg/L	0.002	0.005	04/05/22 17:48	mfm
Potassium, dissolved	M200.7 ICP	5	9.78			mg/L	1	5	04/05/22 13:52	wtc
Selenium, dissolved	SM 3114 B, AA-Hydride	1	<0.002	U		mg/L	0.002	0.005	03/29/22 11:45	mlh
Selenium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.00125	04/05/22 17:48	mfm
Silver, dissolved	M200.7 ICP	5	<0.05	U	*	mg/L	0.05	0.125	04/05/22 13:52	wtc
Sodium, dissolved	M200.7 ICP	5	324		*	mg/L	1	5	04/05/22 13:52	wtc
Thallium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	04/05/22 17:48	mfm
Uranium, dissolved	M200.8 ICP-MS	5	0.00073	B		mg/L	0.0005	0.0025	04/05/22 17:48	mfm
Zinc, dissolved	M200.7 ICP	5	<0.1	U		mg/L	0.1	0.25	04/05/22 13:52	wtc

Subcontract

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Miscellaneous subcontract	Subcontracted Work									

Rio Algom Mining Company
Project ID: 4512060294
Sample ID: 30-07 KD-03192022

ACZ Sample ID: ***L72106-01***
Date Sampled: *03/19/22 15:00*
Date Received: *03/22/22*
Sample Matrix: *Groundwater*

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	319			mg/L	2	20	03/26/22 0:00	eep
Carbonate as CaCO3		1	<2	U		mg/L	2	20	03/26/22 0:00	eep
Hydroxide as CaCO3		1	<2	U		mg/L	2	20	03/26/22 0:00	eep
Total Alkalinity		1	319		*	mg/L	2	20	03/26/22 0:00	eep
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-7.6			%			05/06/22 0:00	calc
Sum of Anions			64			meq/L			05/06/22 0:00	calc
Sum of Cations			55			meq/L			05/06/22 0:00	calc
Chloride	M300.0 - Ion Chromatography	50	413		*	mg/L	20	100	04/04/22 19:53	krh
Cyanide, Total	D7511-09	1	<0.003	UH	*	mg/L	0.003	0.01	04/04/22 16:27	mad
Fluoride	M300.0 - Ion Chromatography	50	<2.5	U	*	mg/L	2.5	12.5	04/04/22 19:53	krh
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	0.052	B	*	mg/L	0.02	0.1	04/09/22 1:48	pjb
Residue, Filterable (TDS) @180C	SM2540C	2	4080		*	mg/L	40	80	03/24/22 13:21	scd
Sulfate	M300.0 - Ion Chromatography	50	2190			mg/L	20	100	04/04/22 19:53	krh
TDS (calculated)	Calculation		3850			mg/L			05/06/22 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.06						05/06/22 0:00	calc

Report Header Explanations

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

QC Sample Types

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

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Alkalinity as CaCO3 SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539061													
WG539061PBW1	PBW	03/26/22 13:03				3.3	mg/L		-20	20			
WG539061LCSW1	LCSW	03/26/22 13:17	WC220311-11	820.0001		830.1	mg/L	101	90	110			
WG539061LCSW2	LCSW	03/26/22 15:34	WC220311-11	820.0001		825.1	mg/L	101	90	110			
WG539061PBW2	PBW	03/26/22 15:40				4.7	mg/L		-20	20			
WG539061LCSW3	LCSW	03/26/22 17:50	WC220311-11	820.0001		825.2	mg/L	101	90	110			
WG539061PBW3	PBW	03/26/22 17:56				5	mg/L		-20	20			
WG539061LCSW4	LCSW	03/26/22 19:53	WC220311-11	820.0001		822.2	mg/L	100	90	110			
WG539061PBW4	PBW	03/26/22 19:59				5.7	mg/L		-20	20			
L72191-02DUP	DUP	03/26/22 22:17			U	U	mg/L				0	20	RA
WG539061LCSW5	LCSW	03/26/22 22:30	WC220311-11	820.0001		843.1	mg/L	103	90	110			

Aluminum, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2		1.959	mg/L	98	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.15	0.15			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	1.0008		.942	mg/L	94	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	1.0008	U	.924	mg/L	92	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	1.0008	U	.924	mg/L	92	85	115	0	20	

Antimony, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.0201		.02016	mg/L	100	90	110			
WG539715ICB	ICB	04/05/22 17:44				.00072	mg/L		-0.00088	0.00088			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.01		.00969	mg/L	97	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.01	U	.00922	mg/L	92	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.01	U	.00958	mg/L	96	70	130	4	20	

Arsenic, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.0494	mg/L	99	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00044	0.00044			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05005		.05004	mg/L	100	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05005	.0006	.05322	mg/L	105	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05005	.0006	.05309	mg/L	105	70	130	0	20	

Barium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2		1.9742	mg/L	99	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.021	0.021			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	.5		.4573	mg/L	91	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	.5	.0081	.4682	mg/L	92	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	.5	.0081	.4696	mg/L	92	85	115	0	20	

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Beryllium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.050706	mg/L	101	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.000176	0.000176			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05005		.050542	mg/L	101	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05005	U	.050897	mg/L	102	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05005	U	.050985	mg/L	102	70	130	0	20	

Boron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2		2	mg/L	100	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.09	0.09			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	.5005		.474	mg/L	95	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	.5005	.165	.634	mg/L	94	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	.5005	.165	.648	mg/L	97	85	115	2	20	

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.053171	mg/L	106	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00011	0.00011			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05005		.050937	mg/L	102	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05005	U	.053854	mg/L	108	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05005	U	.054174	mg/L	108	70	130	1	20	

Calcium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	100		98.92	mg/L	99	95	105			
WG539680ICB	ICB	04/05/22 13:34				.13	mg/L		-0.3	0.3			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	67.99026		58.52	mg/L	86	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	67.99026	2.43	60.86	mg/L	86	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	67.99026	2.43	60.83	mg/L	86	85	115	0	20	

Chloride M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539431													
WG539431ICV	ICV	03/30/22 19:59	WI220328-5	19.96		19.92	mg/L	100	90	110			
WG539431ICB	ICB	03/30/22 20:17				U	mg/L		-0.4	0.4			
WG539547													
WG539547LFB1	LFB	04/04/22 16:36	WI211112-6	30		30.53	mg/L	102	90	110			
L72082-01DUP	DUP	04/04/22 17:12			1.29	1.27	mg/L				2	20	RA
L72085-01AS	AS	04/04/22 17:48	WI211112-6	30	.72	32.02	mg/L	104	90	110			
WG539547LFB2	LFB	04/05/22 1:16	WI211112-6	30		30.61	mg/L	102	90	110			

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Chromium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.05055	mg/L	101	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.0011	0.0011			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05		.05064	mg/L	101	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05	U	.05033	mg/L	101	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05	U	.0502	mg/L	100	70	130	0	20	

Cobalt, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2.01		1.96	mg/L	98	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.06	0.06			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	.5005		.452	mg/L	90	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	.5005	U	.451	mg/L	90	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	.5005	U	.46	mg/L	92	85	115	2	20	

Copper, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2		1.993	mg/L	100	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.03	0.03			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	.5		.462	mg/L	92	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	.5	U	.469	mg/L	94	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	.5	U	.469	mg/L	94	85	115	0	20	

Cyanide, Total D7511-09

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539610													
WG539610ICV	ICV	04/04/22 16:05	WI220323-10	.3003		.3026	mg/L	101	90	110			
WG539610ICB	ICB	04/04/22 16:07				U	mg/L		-0.003	0.003			
WG539610LFB	LFB	04/04/22 16:13	WI220323-7	.1		.1031	mg/L	103	84	116			
L72083-01AS	AS	04/04/22 16:17	WI220323-7	.1	.013	.1078	mg/L	95	84	116			
L72083-01ASD	ASD	04/04/22 16:19	WI220323-7	.1	.013	.115	mg/L	102	84	116	6	20	
WG539610ICV1	ICV	04/06/22 13:03	WI220323-10	.3003		.3089	mg/L	103	90	110			
WG539610ICB1	ICB	04/06/22 13:05				U	mg/L		-0.003	0.003			

Fluoride M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539431													
WG539431ICV	ICV	03/30/22 19:59	WI220328-5	4.016		4.235	mg/L	105	90	110			
WG539431ICB	ICB	03/30/22 20:17				U	mg/L		-0.05	0.05			
WG539547													
WG539547LFB1	LFB	04/04/22 16:36	WI211112-6	1.5		1.541	mg/L	103	90	110			
L72082-01DUP	DUP	04/04/22 17:12			.308	.303	mg/L				2	20	RA
L72085-01AS	AS	04/04/22 17:48	WI211112-6	1.5	.088	1.561	mg/L	98	90	110			
WG539547LFB2	LFB	04/05/22 1:16	WI211112-6	1.5		1.487	mg/L	99	90	110			

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Iron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2		1.923	mg/L	96	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.18	0.18			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	1.0001		.938	mg/L	94	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	1.0001	U	.916	mg/L	92	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	1.0001	U	.918	mg/L	92	85	115	0	20	

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.05227	mg/L	105	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00022	0.00022			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.0501		.0519	mg/L	104	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.0501	.00016	.05429	mg/L	108	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.0501	.00016	.05356	mg/L	107	70	130	1	20	

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	100		95.22	mg/L	95	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.6	0.6			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	49.99828		44.83	mg/L	90	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	49.99828	1.25	46.11	mg/L	90	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	49.99828	1.25	46.06	mg/L	90	85	115	0	20	

Manganese, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2		1.935	mg/L	97	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.03	0.03			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	.499		.471	mg/L	94	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	.499	U	.47	mg/L	94	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	.499	U	.468	mg/L	94	85	115	0	20	

Mercury, total M245.1 CVAA

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539297													
WG539297ICV1	ICV	03/31/22 10:13	HG220328-3	.005005		.00497	mg/L	99	95	105			
WG539297ICB	ICB	03/31/22 10:14				U	mg/L		-0.0002	0.0002			
WG539297LRB	LRB	03/31/22 10:16				U	mg/L		-0.00044	0.00044			
WG539297LFB	LFB	03/31/22 10:17	HG220328-6	.002002		.00194	mg/L	97	85	115			
L72071-03LFM	LFM	03/31/22 10:19	HG220328-6	.002002	U	.00191	mg/L	95	85	115			
L72071-03LFMD	LFMD	03/31/22 10:20	HG220328-6	.002002	U	.002	mg/L	100	85	115	5	20	

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Molybdenum, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.02		.01999	mg/L	100	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00044	0.00044			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05005		.0492	mg/L	98	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05005	.00498	.05924	mg/L	108	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05005	.00498	.05976	mg/L	109	70	130	1	20	

Nickel, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.05043	mg/L	101	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00088	0.00088			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05		.051	mg/L	102	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05	.002	.04902	mg/L	94	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05	.002	.04929	mg/L	95	70	130	1	20	

Nitrate/Nitrite as N M353.2 - H2SO4 preserved

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539989													
WG539989ICV	ICV	04/08/22 23:28	WI220301-7	2.4161		2.313	mg/L	96	90	110			
WG539989ICB	ICB	04/08/22 23:29				U	mg/L		-0.02	0.02			
WG539993													
WG539993LFB	LFB	04/09/22 1:46	WI220401-10	2		2.022	mg/L	101	90	110			
L72106-01AS	AS	04/09/22 1:49	WI220401-10	2	.052	2.229	mg/L	109	90	110			
L72131-01DUP	DUP	04/09/22 1:51			U	U	mg/L				0	20	RA

Potassium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	20		19.55	mg/L	98	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.6	0.6			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	99.95169		91.35	mg/L	91	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	99.95169	1.44	92.64	mg/L	91	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	99.95169	1.44	92.84	mg/L	91	85	115	0	20	

Residue, Filterable (TDS) @180C SM2540C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG538912													
WG538912PBW	PBW	03/24/22 12:45				U	mg/L		-20	20			
WG538912LCSW	LCSW	03/24/22 12:47	PCN65060	1000		1000	mg/L	100	80	120			
L72137-03DUP	DUP	03/24/22 13:45			4900	4912	mg/L				0	10	

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Selenium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.05071	mg/L	101	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00022	0.00022			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05		.05011	mg/L	100	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05	.00268	.05943	mg/L	114	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05	.00268	.05893	mg/L	113	70	130	1	20	

Selenium, dissolved SM 3114 B, AA-Hydride

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539156													
WG539156ICV	ICV	03/29/22 11:01	SE220124-2	.025		.0252	mg/L	101	90	110			
WG539156ICB	ICB	03/29/22 11:04				U	mg/L		-0.006	0.006			
WG539157													
WG539157LRB	LRB	03/29/22 11:41				U	mg/L		-0.006	0.006			
WG539157LFB	LFB	03/29/22 11:43	SE220124-4	.0225		.0214	mg/L	95	85	115			
L72106-01LFM	LFM	03/29/22 11:47	SE220124-4	.0225	U	.0198	mg/L	88	85	115			
L72106-01LFMD	LFMD	03/29/22 11:49	SE220124-4	.0225	U	.0206	mg/L	92	85	115	4	20	

Silver, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	1		.992	mg/L	99	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.03	0.03			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	.5		.443	mg/L	89	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	.5	U	.383	mg/L	77	85	115			M2 ZA
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	.5	U	.358	mg/L	72	85	115	7	20	M2 ZA

Sodium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	100		98.55	mg/L	99	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.6	0.6			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	100.0039		91.48	mg/L	91	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	100.0039	156	236.9	mg/L	81	85	115			M2
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	100.0039	156	239.1	mg/L	83	85	115	1	20	M2

Sulfate M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539431													
WG539431ICV	ICV	03/30/22 19:59	WI220328-5	51.15		53.75	mg/L	105	90	110			
WG539431ICB	ICB	03/30/22 20:17				U	mg/L		-0.4	0.4			
WG539547													
WG539547LFB1	LFB	04/04/22 16:36	WI211112-6	30		32.73	mg/L	109	90	110			
L72082-01DUP	DUP	04/04/22 17:12			77	76.76	mg/L				0	20	
L72085-01AS	AS	04/04/22 17:48	WI211112-6	30	46.8	77.8	mg/L	103	90	110			
WG539547LFB2	LFB	04/05/22 1:16	WI211112-6	30		31.65	mg/L	106	90	110			

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Thallium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.05271	mg/L	105	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00022	0.00022			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05		.05211	mg/L	104	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05	U	.05523	mg/L	110	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05	U	.05342	mg/L	107	70	130	3	20	

Uranium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539715													
WG539715ICV	ICV	04/05/22 17:42	MS220401-7	.05		.05191	mg/L	104	90	110			
WG539715ICB	ICB	04/05/22 17:44				U	mg/L		-0.00022	0.00022			
WG539715LFB	LFB	04/05/22 17:46	MS220401-2	.05		.05065	mg/L	101	85	115			
L72205-02AS	AS	04/05/22 17:57	MS220401-2	.05	.00362	.05968	mg/L	112	70	130			
L72205-02ASD	ASD	04/05/22 17:59	MS220401-2	.05	.00362	.05778	mg/L	108	70	130	3	20	

Zinc, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
WG539680													
WG539680ICV	ICV	04/05/22 13:28	II220401-2	2		1.896	mg/L	95	95	105			
WG539680ICB	ICB	04/05/22 13:34				U	mg/L		-0.06	0.06			
WG539680LFB	LFB	04/05/22 13:46	II220330-3	.50045		.475	mg/L	95	85	115			
L72131-01AS	AS	04/05/22 13:59	II220330-3	.50045	.121	.575	mg/L	91	85	115			
L72131-01ASD	ASD	04/05/22 14:02	II220330-3	.50045	.121	.585	mg/L	93	85	115	2	20	

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Rio Algom Mining Company

ACZ Project ID: ***L72106***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L72106-01	WG539547	Chloride	M300.0 - Ion Chromatography	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).
	WG539610	Cyanide, Total	D7511-09	HC	Initial analysis within holding time. Reanalysis was past holding time, which was required due to a QC failure during the initial analysis.
	WG539547	Fluoride	M300.0 - Ion Chromatography	DC	Sample required dilution. Non-target analyte exceeded calibration range.
			M300.0 - Ion Chromatography	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).
	WG539993	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	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).
	WG538912	Residue, Filterable (TDS) @180C	SM2540C	N1	See Case Narrative.
	WG539680	Silver, dissolved	M200.7 ICP	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M200.7 ICP	ZA	Poor recovery for Silver quality control is accepted due to low Silver solubility in samples, digestates, or extracts that do not contain sufficient Hydrochloric acid.
		Sodium, dissolved	M200.7 ICP	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG539061	Total Alkalinity	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).

Rio Algom Mining Company
Project ID: 4512060294
Sample ID: 30-07 KD-03192022
Locator:

ACZ Sample ID: ***L72106-01***
Date Sampled: *03/19/22 15:00*
Date Received: *03/22/22*
Sample Matrix: *Groundwater*

Lead 210, dissolved — Prep Method:
EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	04/06/22 11:11		12	25	68	pCi/L	*	fdw

Polonium 210, dissolved — Prep Method:
HASL Po-01-RC

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Polonium 210, dissolved	04/05/22 9:18		-0.605	2.7	3.7	pCi/L	*	slc

Radium 226, dissolved — Prep Method:
M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	05/06/22 0:25		1.5	0.14	0.27	pCi/L	*	fdw

Radium 228, dissolved — Prep Method:
M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	04/25/22 13:52		4.9	0.92	1.7	pCi/L	*	msm

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Error(+/-)	Calculated sample specific uncertainty
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
LCL	Lower Control Limit, in % (except for LCSS, mg/Kg)
LLD	Calculated sample specific Lower Limit of Detection
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RER	Relative Error Ratio, calculation used for Dup. QC taking into account the error factor.
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
UCL	Upper Control Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

DUP	Sample Duplicate	*MS/MSD*	Matrix Spike/Matrix Spike Duplicate
LCSS	Laboratory Control Sample - Soil	*PBS*	Prep Blank - Soil
LCSW	Laboratory Control Sample - Water	*PBW*	Prep Blank - Water

QC Sample Type Explanations

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

ACZ Qualifiers (Qual)

H	Analysis exceeded method hold time.

Method Prefix Reference

M	EPA methodology, including those under SDWA, CWA, and RCRA
SM	Standard Methods for the Examination of Water and Wastewater.
D	ASTM
RP	DOE
ESM	DOE/ESM

Comments

(1)	Solid matrices are reported on a dry weight basis.
(2)	Preparation method: "Method" indicates preparation defined in analytical method.
(3)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(4)	An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:
https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Lead 210, dissolved EICHROM, OTW01 **Units:** pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
WG539097																
WG539097LCSW	LCSW	04/05/22	PCN64364	98.31				99	4.5	6.7	101	55	121			
WG539097PBW	PBW	04/05/22						-2.6	2.3	6.9			13.8			
L71280-01DUP	DUP-RPD	04/05/22			6.9	19	54	7.1	12	35				3	20	
L72132-01MS	MS	04/06/22	PCN64364	983	4.8	14	37	830	34	43	84	55	121			
L72132-02DUP	DUP-RER	04/06/22			-34	25	70	7.7	16	43				1.4	2	
L72132-02DUP	DUP-RPD	04/06/22			-34	25	70	7.7	16	43				317	20	RG

Polonium 210, dissolved HASL Po-01-RC **Units:** pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
WG539259																
WG539259PBW	PBW	04/04/22						.171	2.5	3.1			6.2			
L71515-01MS	MS	04/04/22	PCN64364	500	-0.459	2.2	3	519	120	3.7	104	51	128			
WG539259LCSW	LCSW	04/04/22	PCN64364	500				501	110	3.7	100	51	128			
L72132-01DUP	DUP-RPD	04/05/22			-0.167	2.5	3.3	-.0729	4.2	5.3				78	20	RG
L72132-01DUP	DUP-RER	04/05/22			-0.167	2.5	3.3	-.0729	4.2	5.3				0.02	2	

Radium 226, dissolved M903.1 **Units:** pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
WG540657																
WG540657LCSW	LCSW	05/06/22	PCN64374	20				11	0.34	0.31	55	43	148			
WG540657PBW	PBW	05/06/22						-.02	0.08	0.26			0.52			
L71833-04DUP	DUP-RPD	05/06/22			0.35	0.12	0.39	.33	0.08	0.35				6	20	
L72012-02MS	MS	05/06/22	PCN64374	50	2.7	0.29	0.82	24	0.8	0.85	43	43	148			
L72169-01DUP	DUP-RPD	05/06/22			0.06	0.09	0.43	.09	0.06	0.34				40	20	RG
L72169-01DUP	DUP-RER	05/06/22			0.06	0.09	0.43	.09	0.06	0.34				0.28	2	

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Radiochemistry QC Summary

QUIVIRA

ACZ Project ID: ***L72106***

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Radium 228, dissolved M9320 **Units:** pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
WG540483																
WG540483LCSW	LCSW	04/25/22	PCN64684	9.38				9.5	1.1	1.9	101	47	123			
WG540483PBW	PBW	04/25/22						-.02	0.39	0.42			0.84			
L71928-02DUP	DUP-RER	04/25/22			0.69	0.76	1.9	.41	0.67	1.6				0.28	2	
L71928-02DUP	DUP-RPD	04/25/22			0.69	0.76	1.9	.41	0.67	1.6				51	20	RG
L72189-05DUP	DUP-RPD	04/25/22			0.68	0.79	1.9	.25	0.81	2				92	20	RG
L72168-01MS	MS	04/25/22	PCN64684	9.38	1.1	0.91	2.3	12	1.2	1.9	116	47	123			
L72189-05DUP	DUP-RER	04/25/22			0.68	0.79	1.9	.25	0.81	2				0.38	2	

Rio Algom Mining Company ACZ Project ID: ***L72106***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L72106-01	WG539097	Lead 210, dissolved	EICHROM, OTW01	D1	Sample required dilution due to matrix.
			EICHROM, OTW01	Q5	Sample received with inadequate chemical preservation. Additional preservation performed by the laboratory.
			EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
	WG539259	Polonium 210, dissolved	HASL Po-01-RC	Q5	Sample received with inadequate chemical preservation. Additional preservation performed by the laboratory.
			HASL Po-01-RC	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
	WG540657	Radium 226, dissolved	M903.1	Q5	Sample received with inadequate chemical preservation. Additional preservation performed by the laboratory.
			M903.1	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
	WG540483	Radium 228, dissolved	M9320	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.

Radiochemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Lead 210, dissolved	EICHROM, OTW01
Polonium 210, dissolved	HASL Po-01-RC

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Rio Algom Mining Company
4512060294

ACZ Project ID: L72106
Date Received: 03/22/2022 10:49
Received By:
Date Printed: 3/23/2022

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	

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

[1] L72106-01 Container B2519144 (GREEN CUBE): Added 10 mls nitric acid to the sub-sample to adjust the pH to the appropriate range.

Chain of Custody Related Remarks

Client Contact Remarks

Shipping Containers

Cooler Id	Temp(°C)	Temp Criteria(°C)	Rad(µR/Hr)	Custody Seal Intact?
4062	2.8	<=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.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Rio Algom Mining Company
4512060294

ACZ Project ID: L72106
Date Received: 03/22/2022 10:49
Received By:
Date Printed: 3/23/2022

[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 | Accredited Environmental Testing | 2773 Downhill Drive Steamboat Springs, CO 80487 (970) 879-6590 | L 72106

CHAIN of CUSTODY

Report to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.Applegate@bhp.com
Address: 201 C Sante Fe Avenue Grants NM 87020
Telephone: 505-801-1761

Copy of Report to:

Name: See Remarks
Company:
E-mail: See Remarks
Telephone:

Invoice to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.Applegate@bhp.com
Address: 201 C Sante Fe Avenue Grants NM 87020
Telephone: 505-801-1761

Copy of Invoice to:

Name: See Remarks
Company:
E-mail: See Remarks
Address:
Telephone:

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: Liam McNamara **Sampler's Site Information** **State** NM **Zip code** 87020 **Time Zone** MST
***Sampler's Signature:** *Liam McNamara*
*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

Quote #:
PO#: 4512060294
Reporting state for compliance testing:
Check box if samples include NRC licensed material? ✔

ANALYSES REQUESTED (attach list or use quote number)

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	NEW ACL WELLS							
30-07 KD-03192022	3/19/2022 15:00	GW	7	✔							

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

REMARKS

Please CC Report to email list.

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

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Liam McNamara	3.21.22:1000	Tracking / Fedex	3.21.22:1000
		Andy	3/22/22 11:32

Qualtrax ID: 1984 Revision #: 2 White - Return with sample. Yellow - Retain for your records.

L72106 Chain of Custod

Thursday, April 28, 2022

Mark McNeal
ACZ Laboratories, Inc.
2773 Downhill Drive
Steamboat Springs, CO 80487

Re: ALS Workorder: 2204020
Project Name:
Project Number:

Dear Mr. McNeal:

One water sample was received from ACZ Laboratories, Inc., on 4/1/2022. The sample was scheduled for the following analysis:

Isotopic Thorium

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Janice Winn-Shilling
Project Manager

Accreditations: ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Arizona	AZ0828
California (CA)	2926
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
Oklahoma	1301
PJLA (DoD ELAP/ISO 170250)	95377
PJLA (DOE-AP/ISO 17025)	95377
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO010992018-1
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	TN02976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280
Virginia	460305

40 CFR Part 136: All analyses for Clean Water Act samples are analyzed using the 40 CFR Part 136 specified method and include all the QC requirements.

2204020

Isotopic Thorium:
The samples were analyzed for the presence of isotopic thorium according to the current revision of SOP 714.

All remaining acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2204020
Client Name: ACZ Laboratories, Inc.
Client Project Name:
Client Project Number:
Client PO Number: 26439

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L72106-01	2204020-1		WATER	19-Mar-22	15:00

2204020

ACZ LABORATORIES | Accredited Environmental Testing | 2773 Downhill Drive, Steamboat Springs, CO 80487, (970) 879-6590

CHAIN of CUSTODY

Report to:

Name: Mark McNeal	Address:
Company: ACZ Laboratories	
E-mail: markm@acz.com	Telephone:

Copy of Report to:

Name:	E-mail:
Company:	Telephone:

Invoice to:

Name: Kelly Huemmer	Address:
Company: ACZ Laboratories	
E-mail: accountspayable@acz.com	Telephone:

Copy of Invoice to:

Name:	Address:
Company:	
E-mail:	Telephone:

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_____ Zip code_____ Time Zone_____

*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

Quote #:

PO#:

Reporting state for compliance testing:

Check box if samples include NRC licensed material?

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	Thorium230							
L72106-01	3/19/2022 15:00	GW	1	✓							

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

REMARKS

Send to : Shiloh Summy Laboratory Director, ALS Environmental
225 Commerce Drive, Fort Collins CO 80524

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

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
	3/31/22 8:30		4/1/22 1121

Qualtrax ID: 1984 Revision #: 2 White - Return with sample. Yellow - Retain for your records.

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ACZ Workorder No: 2204020

Project Manager: JWS Initials: AXK Date: 04/01/2022

	N/A	YES	NO
1. Are airbills / shipping documents present and/or removable?		X	
Tracking number:			
2. Are custody seals on **shipping** containers intact?		X	
3. Are custody seals on **sample** containers intact?	X		
4. Is there a COC (chain-of-custody) present?		X	
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6. Are short-hold samples present?			X
7. Are all samples within holding times for the requested analyses?		X	
8. Were all sample containers received intact? (not broken or leaking)		X	
9. Is there sufficient sample for the requested analyses?		X	
10. Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	X		
13. Were the samples shipped on ice?	X		
14. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		X

Cooler #:	1						
Temperature (°C):	15.2						
# of custody seals on cooler:	1						
External µR/hr reading:	10						
Background µR/hr reading:	11						

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES** (If no, see Form 008.)

*** Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.**

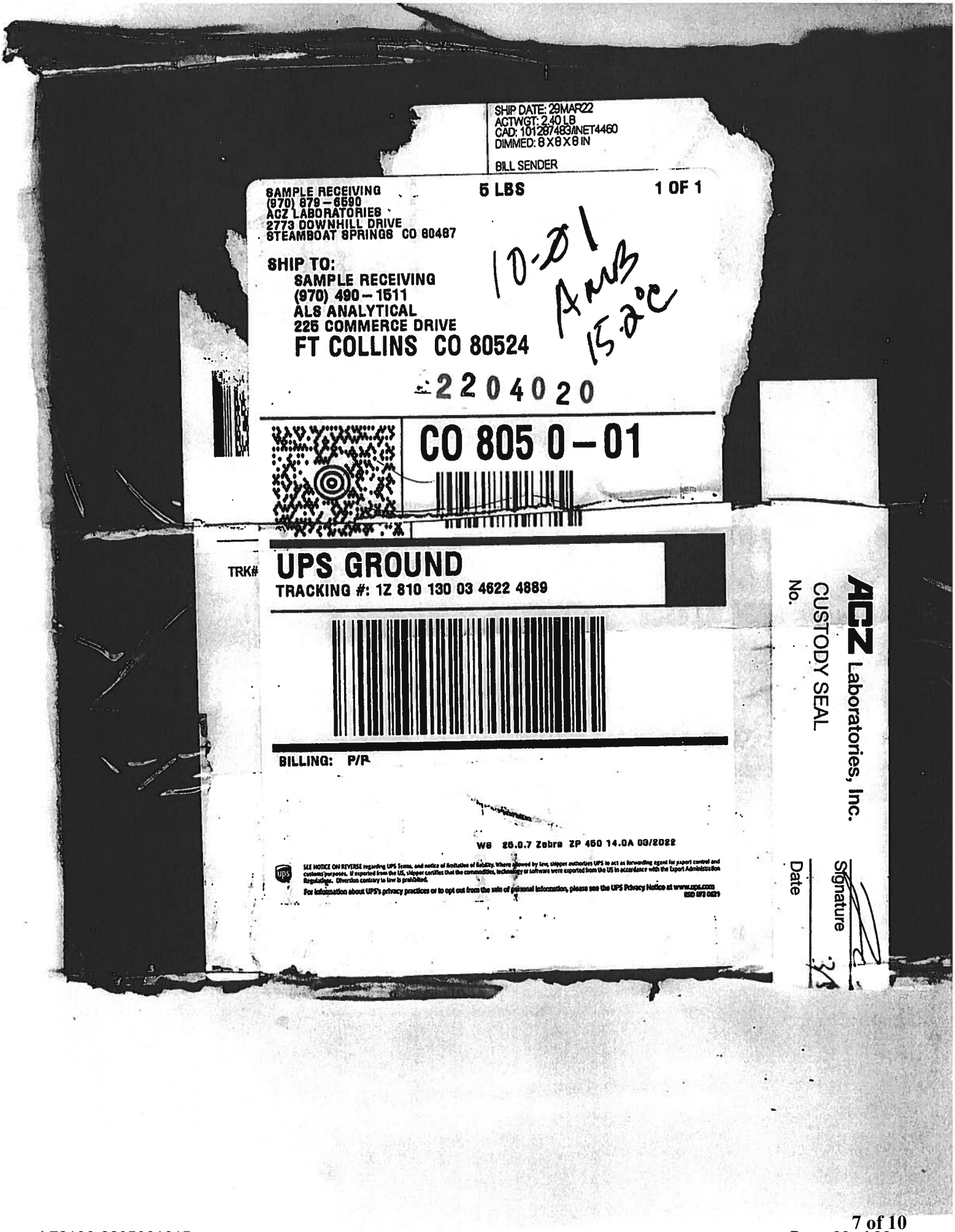
Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: AK

If applicable, was the client contacted? **YES / NO / NA** Contact: Date/Time:

Project Manager Signature / Date: 4/04/22

Form 201r29.xls
(10/15/2019)

*IR Gun #3, VWR SN 170647571
*IR Gun #5, VWR SN 192272629


SHIP DATE: 29MAR22
ACTWGT: 2.40 LB
CAD: 101287483/INET4460
DIMMED: 8 X 8 X 8 IN
BILL SENDER
SAMPLE RECEIVING
(970) 879 – 6590
ACZ LABORATORIES
2773 DOWNHILL DRIVE
STEAMBOAT SPRINGS CO 80487
5 LBS
1 OF 1
10-01 AMB 15.2°C
SHIP TO:
SAMPLE RECEIVING
(970) 490 – 1511
ALS ANALYTICAL
225 COMMERCE DRIVE
FT COLLINS CO 80524
2204020
CO 805 0 – 01
TRK#
UPS GROUND
TRACKING #: 1Z 810 130 03 4622 4889
BILLING: P/R
WS 25.0.7 Zebra ZP 450 14.0A 03/2022
SEE NOTICE ON REVERSE regarding UPS Terms, and notice of limitation of liability. Where allowed by law, shipper authorizes UPS to act as forwarding agent for export control and customs purposes. If exported from the US, shipper certifies that the commodities, technology or software were exported from the US in accordance with the Export Administration Regulations. Diversion contrary to law is prohibited.
For information about UPS's privacy practices or to opt out from the sale of personal information, please see the UPS Privacy Notice at www.ups.com
ISD 072 0621
ACZ Laboratories, Inc.
CUSTODY SEAL
No.
Signature
Date

Client:	ACZ Laboratories, Inc.	**Date:**	*28-Apr-22*
Project:		**Work Order:**	2204020
Sample ID:	L72106-01	**Lab ID:**	2204020-1
Legal Location:		**Matrix:**	WATER
Collection Date:	3/19/2022 15:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Thorium by Alpha Spectroscopy			**SOP 714**	Prep Date: **4/11/2022**	PrepBy: **ZAL**	
Tracer: Th-229	*75.8*		*30-110*	*%REC*	DL = NA	4/27/2022 07:51
Th-230	0.065 (+/- 0.066)	U	0.105	pCi/l	NA	4/27/2022 07:51

Client:	ACZ Laboratories, Inc.	**Date:**	*28-Apr-22*
Project:		**Work Order:**	2204020
Sample ID:	L72106-01	**Lab ID:**	2204020-1
Legal Location:		**Matrix:**	WATER
Collection Date:	3/19/2022 15:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
G - Sample density differs by more than 15% of LCS density.
D - DER is greater than Control Limit

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

QC BATCH REPORT

Batch ID: **AS220411-2-3** Instrument ID: **AlphaSpec2** Method: **Isotopic Thorium by Alpha Spec**

LCS Sample ID: **AS220411-2** Units: **pCi/l** Analysis Date: **4/27/2022 07:51**

Client ID: Run ID: **AS220411-2TH** Prep Date: **4/11/2022** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref Value	DER	DER Limit	Qual
Th-230	2.45 (+/- 0.41)	0.05	2.464		99.6	85-121					P
Tracer: Th-229	2.06	0.02	2.422		84.9	30-110					

MB Sample ID: **AS220411-2** Units: **pCi/l** Analysis Date: **4/27/2022 07:51**

Client ID: Run ID: **AS220411-2TH** Prep Date: **4/11/2022** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref Value	DER	DER Limit	Qual
Th-230	0.009 (+/- 0.03)	0.052									U
Tracer: Th-229	1.84	0.01	2.422		76.1	30-110					

The following samples were analyzed in this batch: 2204020-1 2203532-1