2022 ANNUAL QUARTZ MINING LICENCE REPORT

Submitted to Yukon Government, Energy Mines and Resources

Yukon Quartz Mining Licence QML-0007

March 2023

2022 ANNUAL QUARTZ MINING LICENCE REPORT

Submitted to Yukon Government Energy Mines and Resources

Inactive Yukon Quartz Mining License QML-0007

Carmacks Project, Yukon Territory

Submitted by:

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Executive Summary

Activities at the mine site during the period 1 June 2022 to 4 October 2022 consisted of:

- Soil sampling (N=383) collected on WCC 10, W17, W22, W37, W52, X7, BOY 22, BOY 24, BOY 55, BOY 57, and BOY 58 claims.
- 11 line-km of IP geophysical survey: on W21, W22, W34, W10, W8, W6, W11, W13, W15, W17 W52, W53, X6, X7, DUN3, WCC10, BOY 54-58, BOY 22, and BOY 24 claims.
- Water quality sampling and monitoring program completed by Ensero-Tutchone Environmental along Williams Creek and tributaries (report included).
- Initiated inventory of legacy disturbances over QML-area in preparation for Reclamation and Closure; selected trenches were photographed with a UAV, mapped, and sampled.
- Reclamation of two (2) legacy trenches (TR15-18 or 4TR-B) totalling 504.14m^3 on the BOY 58 and BOY 55 claims (respectively).
- Excavation and concurrent mapping, sampling, and reclamation of three (3) trenches (for a total of 249.75m^3) on the W17 and W22 claims.
- Excavation and concurrent sampling (soil) and reclamation of three (3) test-pits (192.6m^3) on the W21 claim.

The Annual Physical Inspection occurred on 30th August 2022 by Golder Associates Ltd. (attached).

No development activities were undertaken in 2022.

Closure and reclamation security in the amount of $80,300 has been posted with Yukon against the liability incurred as a result of exploration activities. Further engagement with YTG on progressive security payment adjustments is underway for progressive security adjustments to represent an updated summary of liabilities. Granite Creek provided Major Mines Branch with the (draft) Reclamation Plan for Inactive QML0007 in early November 2022.

This report has been formatted to respond to the specific requirements in the QML even though there may be no corresponding project undertakings.

The current corporate structure that evidences the ownership of the mining leases underlying QML0007 by Granite Creek Copper Ltd. is as follows: [1]838232 Yukon Inc., owner of the Quartz Mining leases, and surrounding Quartz Mining claims is a wholly owned subsidiary of Granite Creek Copper Ltd.

[1] The claims were transferred in early 2022 from Copper North Mining Corp to 838232 Yukon Inc.

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1.0 INTRODUCTION

This Annual Report has been prepared by TruePoint Exploration on behalf of Carmacks Mining Corp. and covers the period from January 1, 2022 to December 31, 2022 as required by Clauses 16.5 and 16.6 of Quartz Mining License (*herein* QML) QML-0007. As of January 19, 2012, the assignment of QML-007 was authorized from Carmacks Copper Limited to Carmacks Mining Corp., a now wholly owned subsidiary of Granite Creek Copper (*herein* GCX).

This report provides a summary of activities at the Carmacks Property for the reporting year, including, but not limited to, physical stability inspection and exploration.

Few site activities occurred that would normally form a part of this report. The preliminary mine layout (proposed by Copper North) for the copper heap leach project is illustrated in ***Figure 1*** (following page). It should be noted that new ownership (GCX) intends to close this QML in the upcoming year and resume activities under a Class IV Mining Land Use Permit (filed with YESAB on March 5th 2022, awaiting Recommendation).

The previous ownership (Copper North) had been working to re-engineer the metallurgical process for the project to recover gold and silver in addition to copper since the QML-0007 was issued. The results of the re-engineering work to date are detailed in a Preliminary Economic Assessment (PEA) completed in October 2016 (JDS, 2016), a copy of which was provided with the 2016 Annual Report and represents the general plan for future development of the deposit, subject to regulatory approvals and financing. Nevertheless, QML-0007 applies to the project as planned at the time of issue and therefore dictates the context for this annual report.

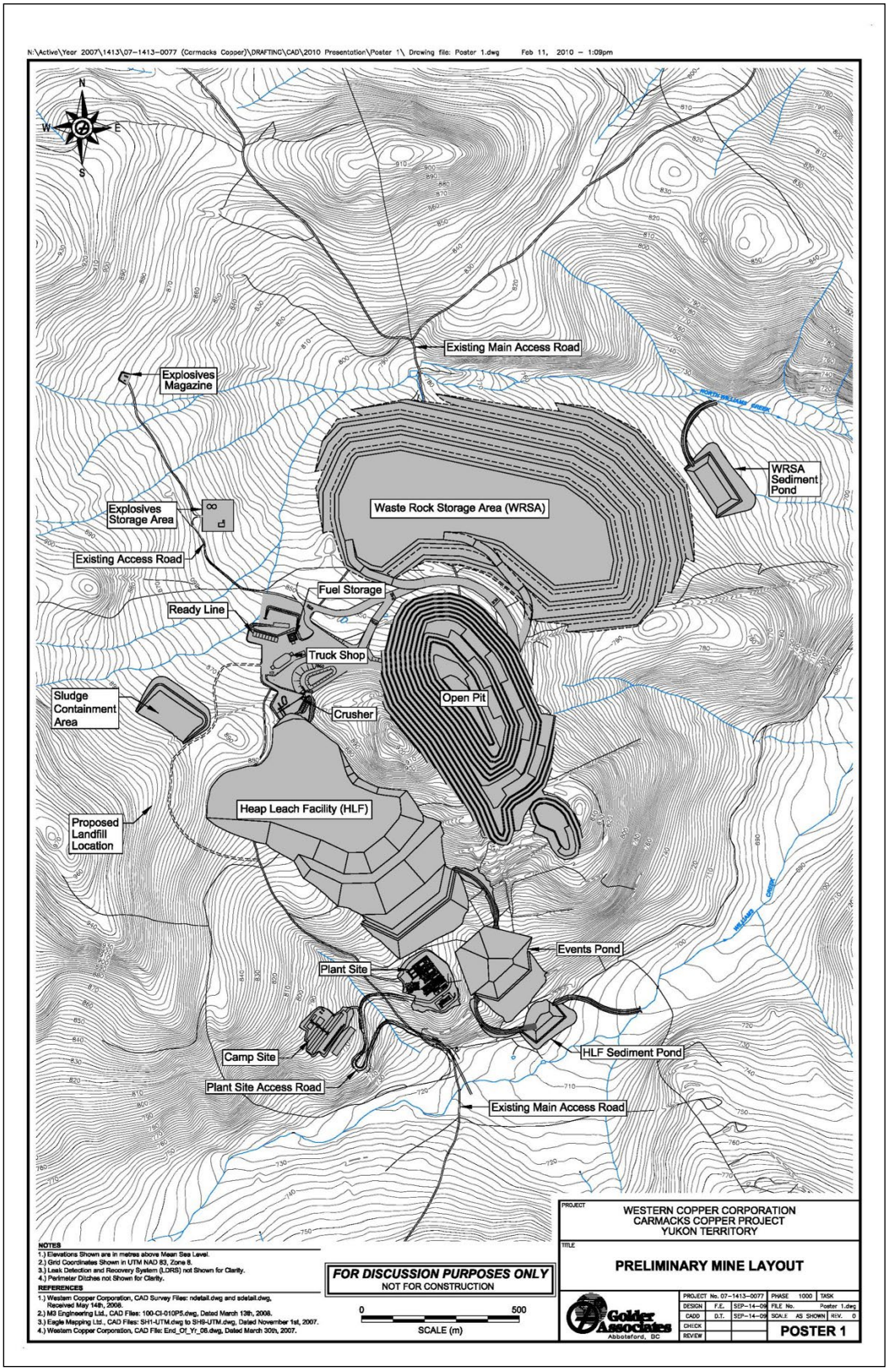


Figure 1. Preliminary Mine Layout (*not constructed*)

2.0 SITE ACTIVITIES

2.1 EXPLORATION

2022 Exploration included soil sampling, ground geophysics, trenching/test-pitting with concurrent reclamation:

- Soil sampling* (N=383) collected: on WCC 10, W17, W22, W37, W52, X7, BOY 22, BOY 24, BOY 55, BOY 57, and BOY 58 claims.
- 11 line-km of IP geophysical survey*: on W21, W22, W34, W10, W8, W6, W11, W13, W15, W17 W52, W53, X6, X7, DUN3, WCC10, BOY 54-58, BOY 22, and BOY 24 claims.
- Excavation and concurrent mapping, sampling, and reclamation of three (3) trenches (for a total of 249.75m^3) on the W17 and W22 claims.
- Excavation and concurrent sampling (soil) and reclamation of three (3) test-pits (192.6m^3) on the W21 claim.

**Non-disturbance activities.*

The above activities occurred to ascertain the resource as well as re-examine metallurgy and quantify mineralization present as sulphide-ore. These activities were completed under a Class I license Q2022_0091 (2023-07-15 expiry).

Total physical 2022 disturbance which occurred on the QML is tabulated below in ***Table 1.***

Table 1. 2022 Disturbance Summary

Claim	Grant #	2022 Clearings	2022 Trenching/ Test-Pitting	2022 Road Upgrades	2022 Road Construction	Note
W 21	*YB26728*	–	192.6 m^3	–	–	Three test pits - concurrently reclaimed
W 22	*YB26729*	–	43.5 m^3	–	–	One trench - concurrently reclaimed
W 17	*YB26724*	–	48.75 m^3	–	–	Two trenches - concurrently reclaimed.
W 17	*YB26724*	–	157.5 m^3	–	–	
2022 TOTAL DISTURBANCE =		0 m^2	442.35 m^3	0 m	0 m	
2022 TOTAL DISTURBANCE UNRECLAIMED =		0 m^2	0 m^3	0 m	0 m	

***NB:** these disturbances occurred under Class I (2022_0091) and were immediately reclaimed.*

2.2 CONSTRUCTION AND DEVELOPMENT

2.2.1 Overview of Activities by Quarter

No construction or development activities occurred on the property in 2022.

2.2.2 As-built Drawings

No as-built drawings were produced in 2022.

2.3 MINING ACTIVITIES

2.3.1 Overview of Activities by Quarter

No mining activities took place in 2022.

2.3.2 Production Schedule – Ore and Waste Removal

Not applicable for this reporting period; no mining activities took place in 2022.

2.3.3 Average Head Grades

Not applicable for this reporting period; no mining activities took place in 2022.

2.3.4 Open Pit Stability

Not applicable for this reporting period; no mining activities took place in 2022.

2.3.5 Heap Leach Cells – Status of Leaching (including layout drawing)

Not applicable for this reporting period; no mining activities took place in 2022.

2.3.6 Copper Production

Not applicable for this reporting period; no mining activities took place in 2022.

2.3.7 Spills

Overheating of Hitachi 330 Excavator roller led to spray of <1L of roller oil underneath the machine along the Main Road from Camp to Zone 1. The spray covered an area of ~1.5m X 1.5m to a depth of <1cm which was cleaned up using absorbent pads (diapers), then the contaminated gravel was shovelled up and placed in a bucket which was shipped out for adequate disposal at a licensed facility. No vegetation or watercourses were impacted from the oil spray.

2.3.8 On-going Reclamation

Two (2) legacy trenches totalling 504.14m^3 were reclaimed (refer to ***Appendix B***):

- TR15-18 totalling 126.38 m^3 (BOY 58 claim); and
- 4TR-B totalling 377.76 m^3 (BOY 55 claim).

2.3.9 Actions Undertaken in Response to Annual Engineer's Inspection

No response was necessary to the 2021 Annual Engineer's inspection report. However, GCX completed some repairs to the existing fuel berm which had punctures noted. Some additional holes in the fuel berm will be patched in 2023, along with vegetation removal (as recommended in the Annual Engineers Report recommendations) to prevent plant roots from further puncturing

the liner. In addition, the Annual Engineers Report outlined bridge maintenance work requirements to the side-decking which are scheduled to be completed in 2023.

2.3.10 Access Road

The access road to the site has not been constructed.

2.4 RESOURCES AND RESERVES

The current resource estimate for the property was recently updated and is as stated in ***Table 2*** (below). This resource estimate dated March 16, 2022 supersedes the previous resource estimates in the October 2016 Preliminary Economic Assessment (PEA; JDS 2016) and the 2018 resource update. A revised PEA is in progress and will be released in 2023. No reserve is currently stated for the property.

***Table 2*. Carmacks Project Mineral Resource Statement (March 16, 2022)**

CATEGORY	Cut -Off Cu (%)	Quantity (Mt)	Grade					Contained Metal				
			Cu Total (%)	Au (g/t)	Ag (g/t)	Mo (%)	CuEq Total (%)	Cu (Mlbs)	Au (koz)	Ag (koz)	Mo (klbs)	CuEq (Mlbs)
IN PIT OXIDE												
Measured	0.30	11.361	0.96	0.40	4.11	0.006	1.30	239.327	145	1,501	1,530	324.93
Indicated	0.30	4.330	0.91	0.28	3.37	0.007	1.16	86.846	39	469	621	110.99
Measured + Indicated	0.30	15.691	0.94	0.36	3.91	0.006	1.26	326.173	184	1,971	2,150	435.93
Inferred	0.30	0.216	0.52	0.09	2.44	0.006	0.63	2.473	1	17	31	3.01
IN PIT SULPHIDE												
Measured	0.30	5.705	0.68	0.16	2.54	0.016	0.88	86.046	28	467	2,002	110.53
Indicated	0.30	13.486	0.72	0.19	2.83	0.013	0.93	214.323	82	1,226	3,999	277.23
Measured + Indicated	0.30	19.191	0.71	0.18	2.74	0.014	0.92	300.369	110	1,693	6,001	387.76
Inferred	0.30	1.675	0.51	0.13	2.24	0.020	0.70	18.918	7	121	732	25.95
BELOW PIT SULPHIDE												
Measured	0.60	0.026	0.71	0.16	2.54	0.010	0.88	0.407	0	2	6	0.506
Indicated	0.60	1.341	0.82	0.19	2.88	0.012	1.03	24.329	8	124	364	30.418
Measured + Indicated	0.60	1.367	0.82	0.19	2.88	0.012	1.03	24.736	8	126	370	30.924
Inferred	0.60	0.967	0.77	0.17	2.48	0.012	0.96	16.456	5	77	249	20.436

2.5 CARE AND MAINTENANCE

No activities to report.

2.6 PROPOSED DEVELOPMENT AND PRODUCTION FOR UPCOMING YEAR

There are presently no development or production plans for the 2023 year. As aforementioned, the intention is to close the QML and continue work activities under a Class IV Mining Land Use Permit which was submitted on March 5th 2022.

3.0 MONITORING PROGRAMS AND STUDIES

The QML contains several requirements for studies and monitoring programs. The following sections outline work done with respect to these studies and programs.

3.1 ON-GOING METALLURGICAL STUDIES

3.1.1 Field Tests

No metallurgical field tests were in progress as of 2022.

3.1.2 Laboratory Tests

A test program including mineralogy and flotation was completed by SGS Canada Inc. on crushed reject samples of sulphide and oxide ores from the Carmacks project. The results below are taken from the conclusions and recommendations. The full report is in Appendix C.

The flotation test program included testwork on sulphide, oxide, and blend ores.

- The sulphide ore assayed 0.92% Cu, 0.67% S, and 0.24 g/t Au. Gold and copper head grades calculated from the flotation test assays agreed well with the direct head assays.
- The oxide ore assayed, 0.60% Cu, 0.06% S, and 0.25-0.82 g/t Au indicating that nugget gold may exist. However, the gold head grade calculated from the flotation tests was consistently between 0.20 g/t to 0.23 g/t with an average of 0.21 g/t.
- Sulphide flotation recovered 93.7% of copper and 69.0% of gold at 42.7 % Cu and 7.7 g/t Au grade (Sulphide F4) while oxide flotation recovered 39.8% of copper and 57.5% of gold at 26.2% Cu and 13.6 g/t Au grade.
- Blend batch flotation recovered 75.3% of copper and 65.7% of gold at 40.8 % Cu and 12.4 g/t Au grade (Blend F4).
- Locked cycle flotation on blend sample recovered 82.0% of copper and 70.1% of gold at 40.1% Cu and 10.6 g/t Au grade (Blend LCT1).
- Flotation optimization and an economical evaluation of the target copper grade versus recovery is recommended in future testwork.

Head QEMSCAN mineralogy was performed on sulphide and oxide samples. The major copper minerals are chalcopyrite and bornite for sulphide sample, and malachite/azurite, Cu-bearing Fe hydroxide, Cu-bearing silicate (chlorite), and chalcopyrite for oxide sample while pyrite content is extremely low for both samples (<0.05% S). The major gangue minerals are albite, plagioclase, quartz, K-feldspar, biotite, amphiboles, and chlorites.

3.2 HEAP LEACH PAD LINER PERFORMANCE MONITORING

No liner has been placed and no performance monitoring is in progress.

3.3 WATER QUALITY SURVEILLANCE PROGRAM

Surface water quality surveillance was conducted by Ensero Solutions from Whitehorse and Tutchone Environmental from Carmacks along Williams Creek and tributaries in 2022.

The locations established to date for the monitoring of surface water quality are in ***Table 3*** and ***Figure 2***. Additional locations may be added as needed. Approximately 30 groundwater monitoring wells have been drilled on the QML and immediate vicinity since 1995. The most recent were six (6) installed by Golder Associates Ltd. in 2017 to enable pumping tests and monitoring of piezometric elevation.

Table 3. **Surface Water Quality Surveillance Program Site Descriptions and Locations on or draining from QML0007**

Station	Description	Northing	Easting
W1	Williams Creek tributary upstream of Confluence with North Williams Creek	6913840	413136
W2	Williams Creek Upstream of North Williams Creek Confluence	6914145	413499
W3	Lower North Williams Creek Upstream of Confluence with Williams Creek	6914379	413640
W4	Williams Creek Downstream of Confluence with North Williams Creek	6914653	413888
W5	South East Tributary to Williams Creek	6912947	412978
W6	Williams Creek Downstream of South East Tributary	6913373	413042
W7	Upper North Williams Creek Tributary Upstream of Road Crossing	6914810	411778
W9	Williams Creek Upstream of Access Road Crossing	6912511	411907
W10	Williams Creek Upstream of Yukon River	6919033	416606
W11	Nancy Lee Creek (Tributary of Williams Creek)	6918096	415803
W12	Williams Creek Downstream of Confluence with Nancy Lee Creek	6918000	416102
W13	Williams Creek Upstream of Confluence with Nancy Lee Creek	6917984	415912
Y1	Yukon River Upstream of Williams Creek	6918974	416752
Y2	Yukon River Downstream of Williams Creek	6919308	416249

Notes: Coordinates are UTM Zone 8 NAD83.

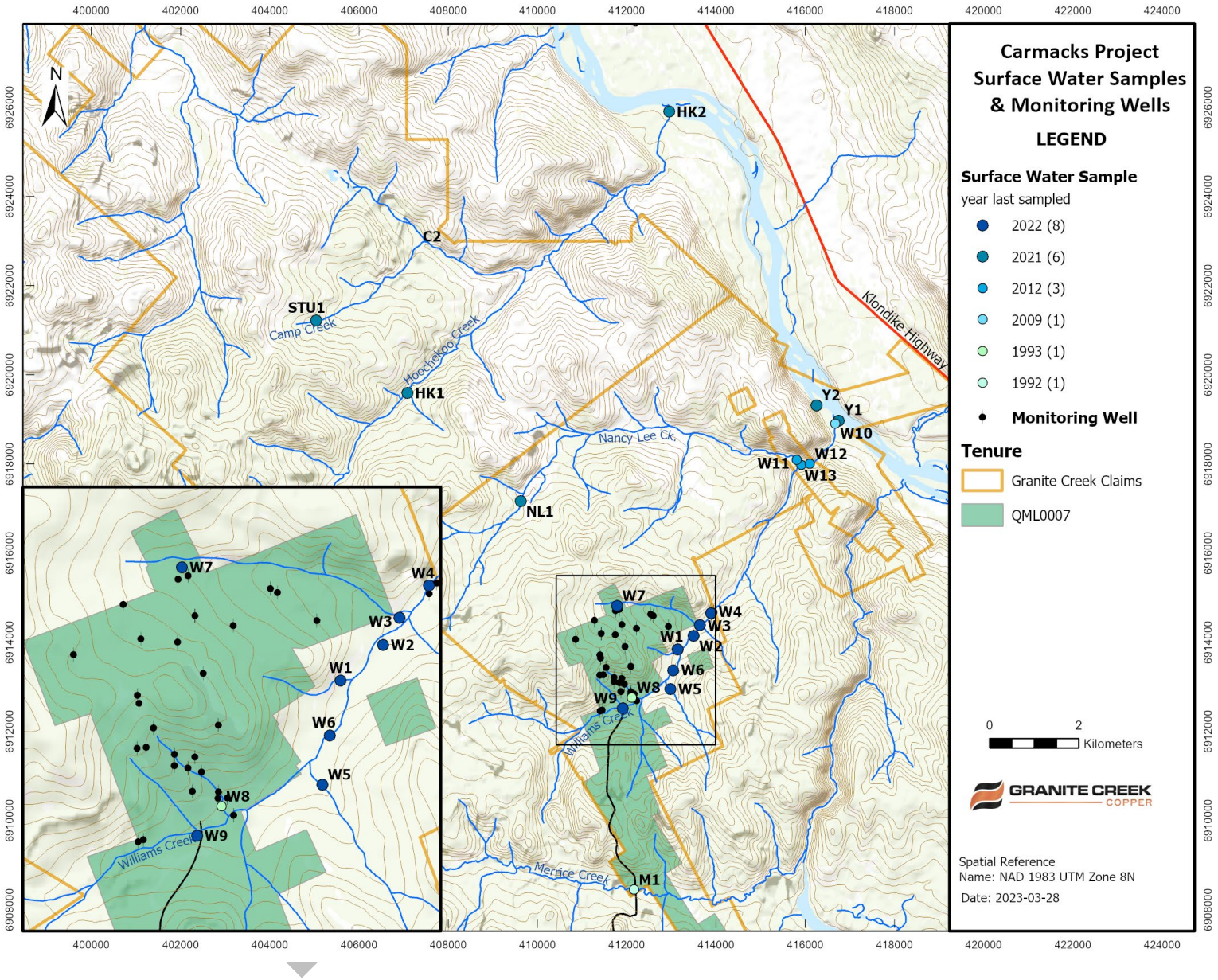


Figure 2. Water Quality Monitoring Station Locations

3.3.1 Surface Water Quality

Surface water quality monitoring was conducted by Ensero-Tutchone Environmental on September 13th and 14th, 2022 from eight sample sites along Williams Creek and tributaries located on or draining from QML0007. Samples were collected from sites W1 through to W7 and W9 on figure 2. Refer to Appendix D for the complete Memorandum which includes both the 2021 and 2022 sampling events.

In 2021 samples were collected from 6 sites outside of QML0007 draining from claims held by Granite Creek Copper. Results from 2021 sampling event revealed, total aluminum, copper, and iron exceeded either the CCME (Canadian Council of Ministers of the Environment) or SSWQO (Site Specific Water Quality Objectives developed for sites along Williams Creek for total Al, Cu and Fe) guidelines at all sites except NL-1. Fluoride exceeded the CCME guideline at Y1, HK-2, and STU-1, and total chromium exceeded the CCME guideline at Y1 and Y2. Lastly, dissolved copper and zinc exceeded the CCME guideline at Y1 and NL-1, respectively.

Results from the 2022 sampling event revealed that the field pH and dissolved oxygen were slightly above CCME guidelines at W1 and W5, respectively. Fluoride exceeded the CCME guideline for all stations sampled in 2022, and total aluminum exceeded the CCME guideline at W2, W4, and W6. Total copper exceeded the CCME guideline at W5 and W7. Total iron exceeded the SSWQO at W5, and the CCME guideline at W2, W4, and W6, and dissolved iron exceeded the CCME guideline at W2 and W5.

Streamflow measurements were collected from sites in 2022 where flow was sufficient. Continued surface water quality monitoring will occur during the 2023 season.

3.3.2 Groundwater Quality

No groundwater quality monitoring was completed on the QML during the 2022 season.

3.4 HYDROGEOLOGY STUDIES

Six (6) groundwater wells were installed by Golder Associates Ltd. in 2017 in the area of the planned dry stack tailings management area (described in JDS, 2016) to enable pumping tests and monitoring of piezometric elevation to preface mine-development. Data was collected from the piezometers in 2017 but no report was completed on the study. Granite Creek is working towards closure of the QML and a Class IV Mining Land-Use Application was filed on March 5th 2022.

3.5 WATER TREATMENT AND MANAGEMENT

No water treatment studies, or water management studies were required or conducted in 2022.

3.6 CLIMATE DATA AND SNOW SURVEY MONITORING PROGRAM

Granite Creek Copper did not conduct any meteorological monitoring on site in 2022.

3.7 GEOCHEMICAL STUDIES AND ACID-BASE ACCOUNTING

Tailings residue from locked cycle metallurgical tests conducted in 2015 have been submitted for geochemical analysis and humidity cell testing. The lab work has been completed and the geochemical test report is attached in ***Appendix C***.

3.8 PHYSICAL MONITORING PROGRAM

Physical monitoring of structures and facilities in 2022 was limited to the Annual Engineer's Inspection.

3.9 ENGINEER'S ANNUAL PHYSICAL INSPECTION REPORTS

Granite Creek Copper engaged Golder Associates Ltd. to perform the Annual Physical Inspection of the site required under Sections 16.1 and 16.2 of the QML. This inspection occurred on the 30 of August 2022 (refer to ***Appendix A***).

Items requiring repair identified in the 2021 Annual Physical Report were limited to:

(1) Damage to the geomembrane liner of the fuel storage berm → GCX completed repairs to the majority of punctures to the fuel liner; final repairs will be completed during the 2023 field season (see below for further details).

(2) Minor maintenance in relation to road maintenance to prevent erosion and washouts and ongoing minor maintenance of silt fences and sediment traps → further work in this area has resulted in vegetation re-growth which is now covering silt fences and sediment traps.

The 2022 Annual Physical report focused on inspection of existing site conditions and of the limited infrastructure on site, since no development has yet taken place on site. No areas were identified as requiring immediate attention.

Recommendations from the 2022 Annual Physical Report are provided here in *italics* for reference with planned response activities:

- *Water crossings, including the bridge abutments at Merrice Creek, should continue to be inspected annually and following major rainfall events. Maintenance should be carried out, as required to maintain the functionality and safety of these crossings.* → Best management practises for watercourse crossing maintenance will be implemented following a site tour to outline practical mitigative steps which align with DFOs new Guidelines.

- *The wood side rails on the Merrice Creek bridge have separated from the wood decking. The wood rails should be repaired and reattached to the bridge deck.* → to be completed in 2023.

- *Drainage repairs and upgrades, such as constructing ditches, is required along the access road between Freegold Road and Merrice Creek*. This maintenance will be

completed when licensing permits GCX to do such repairs as these crossings are outside of the QML area.

- *The damage to the liner at the fuel storage area should be [fully] repaired […] At the time when the repairs to the liner are made, the vegetation within the bermed area should be removed, the area inspected and repaired, if required. Alternatively, the project may want to consider decommissioning and replacing the existing fuel bund with one or more double walled fuel tanks.* → Suggested repairs and maintenance to be completed in 2023. If GCX's Class IV QMLU is approved, the fuel bund area may be decommissioned, assessed for hydrocarbon contamination, with installation of such fuel tanks as outlined in the Class IV QMLU Application.

3.10 RECLAMATION AND REVEGETATION STUDIES

In 2007, a test patch of seeding was completed on an approximately 500 m x 12 m area located adjacent to the west side the access road and south of the Williams Creek crossing and the helicopter pad area. The seeding, and resulting vegetation, was intended to help stabilize sediments in this area and has been observed in the past six years to be performing well and is now well established. In addition, local native species of grasses and woody plants have begun to naturally establish in the area and no sediment movement has been observed indicating that the re-vegetation has been effective to minimize erosion.

3.11 SUBMISSION AND APPROVAL OF PLANS

No development plans were submitted during 2022. Application for a Class IV Mining Land Use permit was submitted to YESAB on March 5th 2022 which will cover exploration activities on QML0007 and surrounding claims. A Reclamation Plan for the Inactive QML0007 was submitted to the Mineral Resources Branch in November 2022. The plan is not included in this document because as of time of writing it has not been approved. Once a final Reclamation Plan is approved, Granite Creek will move ahead with reclaiming trenches, clearings and roads.

4.0 OUTSTANDING FINANCIAL LIABILITY

4.1 HEAP LEACH

There has been no update to the assessment of the liability associated with the Heap Leach Facility, which was presented in the May 2009 revision of the Preliminary Detailed Closure and Reclamation Plan.

4.2 WASTE ROCK STORAGE

There has also been no update to the assessment of the liability associated with the Waste Rock Storage Facility, which was presented in the May 2009 revision of the Preliminary Detailed Closure and Reclamation Plan.

4.3 OVERALL LIABILITY

The estimated maximum overall liability associated with the development and operation of the mine remains as set out in the May 2009 revision of the Preliminary Detailed Closure and Reclamation Plan is detailed in ***Table 4***.

***Table 4*. Estimated closure liability for the planned heap leach project**

Facility or Area Description	Cost
Open Pit	$ 23,000
Heap Leach Facility	$ 17,295,000
HLF Events and Sediment Ponds	$ 296,000
Waste Rock Storage Area	$ 740,000
Plant and Ancillary Facilities	$ 467,000
Camp	$ 103,000
Truck Shop Service Complex	$ 70,000
Miscellaneous Facilities	$ 95,000
Access and Haul Roads	$ 248,000
Site Management	$ 1,103,000
Total	**$ 20,440,000**

An additional $2.675 million in addition to the above total has been estimated to cover costs associated with rinsing and neutralization of the heap leach facility, should the rinsing period extend to 9 years instead of the initially estimated 4.5-year period.

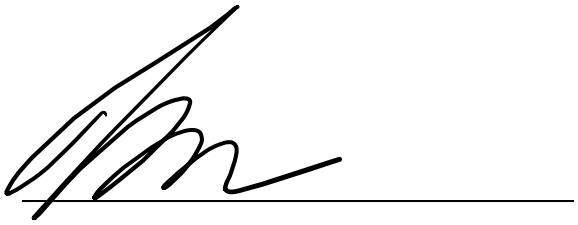
To date, security in the amount of $80,300 has been posted with Yukon Government. This represents the accrued liability due to exploration activities on the site. Further discussions are underway for progressive security adjustments to represent an updated summary of liabilities to reflect the proposed Reclamation Plan for the Inactive QML (submitted to YG-Major Mines, November 2022).

4.4 ENGINEERING CONTINGENCIES

In accordance with Section 11.0 of the QML, Copper North Mining Corp. prepared a Contingency Plan based on a workshop held in October 2009. The plan was submitted to the Chief of Mining Land Use in January 2010. The main purpose of the Contingency Plan was to identify possible alternative approaches to decommissioning the Heap Leach Facility, however, other facilities were also examined. The plan identified several possible failure modes and contingency measures for each of the facilities and recommended further work that should be undertaken. The report was issued in draft format pending comments from government. No comment from government has been received to date. No further work has been undertaken to develop any of the contingency plans identified.

GRANITE CREEK COPPER

(On behalf of CARMACKS MINING CORP.)



Tim Johnson

CEO & Director Granite Creek Copper

Director Carmacks Mining Corp

Appendix A. 2022 Physical Inspection Report

Appendix B. 2022 Reclamation Report

Appendix C. 2022 Metallurgy Report

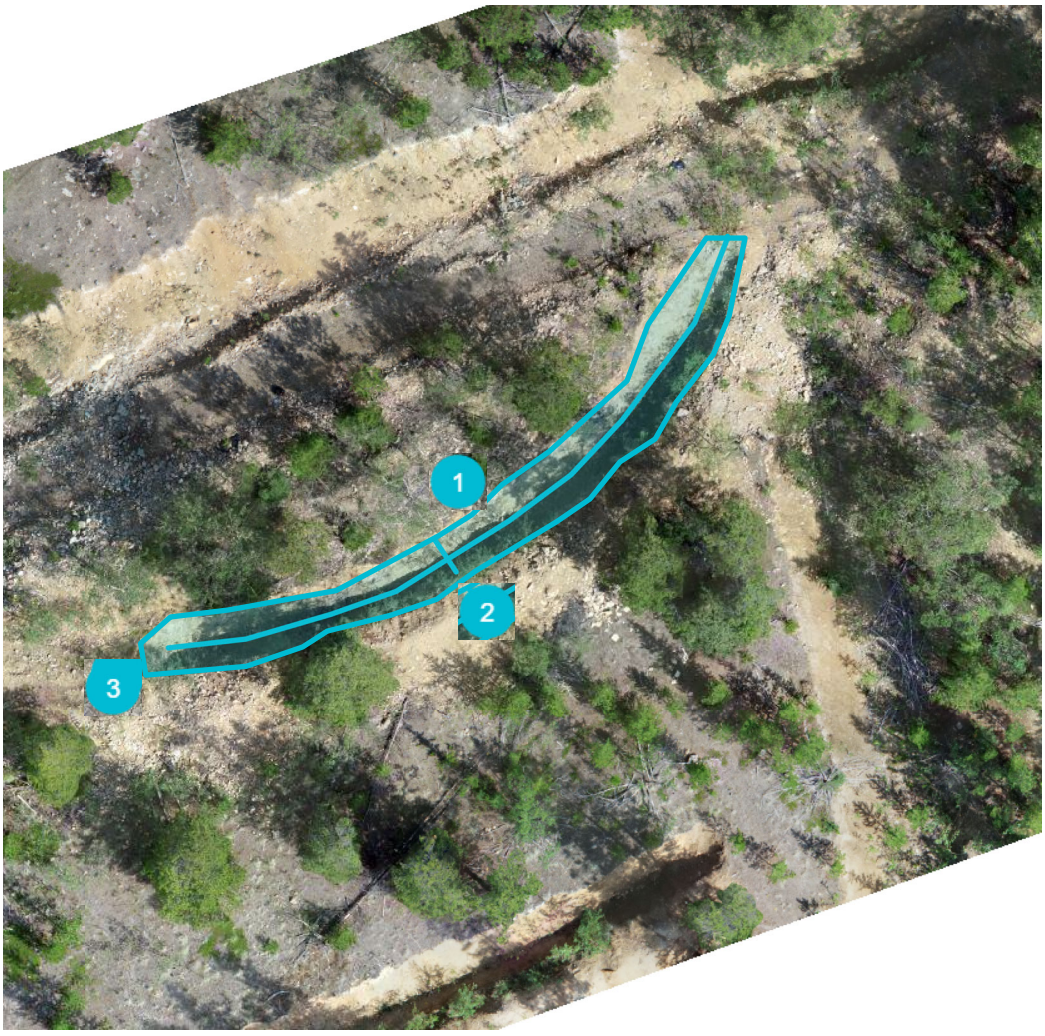
Appendix D. 2022 Water Quality Monitoring Report

Truepoint exploration

Carmacks 2022 Annotation Report

Created on September 27, 2022

Captured on August 9, 2022



Distance

Label	Title	Length	Horizontal	Vertical	Slope	Surface
1	Length	41.21 m	40.81 m	2.66 m	3.72°, 6.51%	44.25 m
2	Width	2.08 m	2.08 m	0.17 m	4.65°, 8.13%	4.72 m

Volume

Label	Title	Area	Cut	Fill	Net	Tolerance
3	Volume	127.46 m2	6.25 m3	132.63 m3	126.38 m3	0 cm

Truepoint exploration

Carmacks Copper Annotation Report

DroneDeploy

Created on September 27, 2022

Captured on August 4, 2021

Distance

Label	Title	Length	Horizontal	Vertical	Slope	Surface
1	Length	111.12 m	110.02 m	-3.53 m	-1.84°, 3.21%	115.81 m
2	Part of trench remaining open	35.27 m	34.94 m	3.32 m	5.43°, 9.51%	39.71 m
3	Width	3.02 m	3.00 m	0.32 m	6.15°, 10.77%	5.44 m

Volume

Label	Title	Area	Cut	Fill	Net	Tolerance
4	Trench volume	455.97 m2	13.68 m3	391.44 m3	377.76 m3	0 cm

An Investigation into

METALLURGICAL TESTWORK ON SAMPLES FROM CARMACKS PROJECT

prepared for

GRANITE CREEK COPPER LTD.

Project 19248-001 – Final Report
December 12, 2022

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Member of the SGS Group (SGS SA)

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Executive Summary

The Carmacks project is a gold-copper deposit located in Canada's Yukon Territory. A test program including head characterization, mineralogy, and flotation was completed on samples from the Carmacks deposit.

1. Head Characterization

Gold and copper were the two major valuable elements. The major element assays are summarized in Table I.

Table I: Head Assays

Sample ID	Au, g/t	Ag, g/t	Cu, %	S, %
Sulphide	0.24	3.0	0.92	0.67
Oxide[1]	0.21	2.4	0.60	0.06
Blend (S:O=50:50) [2]	0.22	2.7	0.76	0.37
Blend (S:O=60:40)[3]	0.23	2.8	0.79	0.43

1-Au grade was calculated fron flotation products

2,3- Head grade was calcualted based on sulphide and oxide ratio

2. Mineralogy

Head QEMSCAN mineralogy was performed on sulphide and oxide samples and the details are appended. The major copper minerals are chalcopyrite and bornite for sulphide sample, and malachite/azurite, Cu-bearing Fe hydroxide, Cu-bearing silicate (chlorite), and chalcopyrite for oxide sample while pyrite content is extremely low for both samples (<0.05% S). The major gangue minerals are albite, plagioclase, quartz, K-feldspar, biotite, amphiboles, and chlorites.

3. Flotation

Flotation tests were performed by the Bureau Veritas metallurgical lab in Richmond, British Columbia in a previous phase of testwork. Although very good flotation results had been obtained with the sulphide ore, copper flotation from the oxide ore had been unsuccessful. Through modification of the reagent scheme, SGS was able to obtain very good flotation results on oxide as well as oxide-sulphide blends, as summarized in Table II. It is recommended that flotation optimization be continued in future test programs.

Table II: Summary Results of Flotation

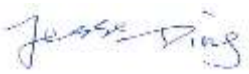
Test No.	Grade, %, g/t			Recovery, %		
	Cu	Au	Ag	Cu	Au	Ag
Sulphide F4	42.7	7.67	117	93.7	69.0	78.4
Oxide F5	26.2	13.6	93	39.8	57.5	37.4
Blend F4	40.8	12.4	120	75.3	65.7	66.2
Blend LCT1	40.1	10.6	104	82.0	70.1	68.6

Introduction

This report summarizes the testwork completed by SGS Vancouver Metallurgy on samples from the Carmacks project from June to August 2022. The testwork included sample preparation, mineralogy, and flotation.

The appendices to this report contain a complete database of information from the program.

The project was managed by Dr. Jesse Ding and the results were issued to the client representative, Mr. Timothy Johnson, CEO of Granite Creek Copper Ltd.



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Experimental work by: Max Ahn and Benito Rectitud
Report preparation by: Jesse Ding
Reviewed by: Cheryl Mina, Dominique Lascelles, and Peter Arendt

Testwork Summary

1. Sample Receipt and Preparation

Eight pails of samples were delivered to the SGS Burnaby facility on May 25, 2022. The samples were received as crushed rejects consisting of sulphide and oxide samples. The sample inventory is presented in Table 3 and Table 4.

Table 3: Sample Inventory – Sulphide

Sampl ID		Wt, g
WHI 21000599	RJ 16 (1/3)	2987.5
	RJ 16 (2/3)	3729
	RJ16 (3/3)	5536
	RJ17 (1/3)	3775.5
	RJ18 (3/3)	4777
	RJ 19 (1/3)	1049.5
	RJ 19 (2/3)	6179
	RJ20 (1/3)	4066
WHI 21000260	RJ22 (3/3)	6132
	RJ23 (2/3)	5217.5
	RJ23 (3/3)	4188
	RJ24 (1/3)	4637
	RJ24 (2/3)	2565
Total		54839

Table 4: Sample Inventory – Oxide

Sample ID	Wt, g
C490889	4293.5
C490890	2337.5
C490891	4073
C490946	4065.5
C490947	2566
C490948	2266.5
C490505	2105.5
C490506	3212
C490507	3583.5
C490538	2793.5
C490539	2719.5
C490540	2533.5
C490541	2962
C490542	2781
C490543	2665
C490544	2783
C490545	2849
C490546	2775
C490547	2908
C490548	2839.5
TOTAL	59112

The composites were crushed to 100% passing 10 mesh. Each crushed composite was homogenized and split into test charges for the metallurgical testwork. Test charges were freezer stored throughout the duration of the test program.

2. Head Characterization

A subsample from each composite was pulverized and submitted for head assays. The results are presented in Table 5.

It should be noted that repeated gold fire assays were conducted on the oxide composite, and the gold grade varied significantly, indicating that nugget gold may exist. It is recommended that screened metallics be performed on the oxide composite in future testwork.

Table 5: Head Analysis Summary of the Composites

Sample ID	Sulphide	Oxide
Cu %	0.92	0.60
Cu H_2SO_4 %	0.099	0.464
Cu NaCN %	0.551	0.325
Au g/t	0.24	0.42
Au g/t	-	0.25
Au g/t	-	0.82
Ag g/t	3.0	2.4
S %	0.67	0.06
C(t) %	0.35	0.27
Hg g/t	< 0.3	< 0.3
SiO_2 %	52.4	55.9
Al_2O_3 %	16.9	17.6
Fe_2O_3 %	7.64	6.37
MgO %	3.97	2.47
CaO %	5.72	4.66
Na_2O %	4.21	4.55
K_2O %	2.49	2.96
TiO_2 %	0.81	0.66
P_2O_5 %	0.35	0.26
MnO %	0.11	0.1
Cr_2O_3 %	< 0.01	< 0.01
V_2O_5 %	0.04	0.03
LOI %	2.91	3.36
Sum %	97.5	99
As g/t	< 40	< 40
Ba g/t	1320	1340
Be g/t	1.39	1.35
Bi g/t	< 20	< 20
Cd g/t	< 2	< 2
Co g/t	40	23
Li g/t	< 20	< 20
Mo g/t	261	29
Ni g/t	46	< 20
Pb g/t	< 20	< 20
Sb g/t	< 10	< 10
Se g/t	< 30	< 30
Sn g/t	< 20	< 20
Sr g/t	791	635
Tl g/t	< 30	< 30
Y g/t	17.3	14.5
Zn g/t	103	70

3. Mineralogy

A subsample of each composite was ground to a P_{80} of ~150 µm and submitted for mineralogical analysis by QEMSCAN (Quantitative Evaluation of Minerals Analysis by Scanning Electron Microscopy) to identify the minerals and their liberation. The results are summarized in the following sections, and the full data report is included in Appendix A.

3.1. Modal Mineralogy by QEMSCAN

The modal mineral distributions are presented in Table 6. The modal distributions show that both composites have low pyrite content. The major copper minerals for sulphide composite are chalcopyrite and bornite while the major minerals for oxide composites are malachite/azurite (0.32%), Cu-bearing Fe hydroxide (0.57%), and Cu-bearing silicate (1.65%) which could impact oxide copper recovery in flotation.

Table 6: Modal Mineral Distribution

Sample		Sulphide			Oxide		
Fraction		Combined	+75µm	-75µm	Combined	+75µm	-75µm
Mass Size Distribution (%)		100.0	43.9	56.1	100.0	50.4	49.6
Mineral Mass %	Pyrite	0.01	0.01	0.02	0.05	0.05	0.05
	Chalcopyrite	1.36	0.93	1.70	0.10	0.07	0.14
	Bornite	1.15	0.71	1.49	0.01	0.01	0.01
	Chalcocite/Digenite	0.02	0.01	0.02	0.01	0.01	0.01
	Molybdenite	0.07	0.04	0.10	0.00	0.00	0.01
	Other Sulphides	0.00	0.00	0.01	0.00	0.00	0.00
	Malachite/Azurite	0.00	0.00	0.00	0.32	0.29	0.36
	Chrysocolla	0.00	0.00	0.00	0.01	0.00	0.02
	Delafossite	0.00	0.00	0.00	0.02	0.02	0.02
	Cu Oxide and Cu Metal	0.00	0.00	0.00	0.00	0.00	0.00
	Cu-Bearing Fe Hydroxide	0.00	0.00	0.00	0.57	0.30	0.86
	Cu-Bearing Silicate (chlorite)	0.15	0.01	0.26	1.65	0.60	2.72
	Quartz	6.32	6.78	5.95	8.24	8.97	7.49
	Albite	29.1	37.4	22.6	22.5	25.8	19.1
	Plagioclase	14.0	14.4	13.7	25.4	29.6	21.3
	K-Feldspar	6.92	7.09	6.78	12.0	12.0	12.0
	Anorthoclase	1.36	1.45	1.29	1.17	1.11	1.23
	Muscovite	0.42	0.54	0.32	0.34	0.39	0.30
	Biotite	13.7	12.0	15.0	10.1	9.63	10.5
	Chlorites	9.86	5.81	13.0	6.44	3.27	9.65
	Clays	0.03	0.02	0.03	0.18	0.12	0.24
	Amphiboles	10.3	8.96	11.4	6.21	4.79	7.65
	Other Silicates	1.34	1.03	1.59	0.62	0.34	0.91
	Fe Oxide/Hydroxide	0.33	0.30	0.36	1.12	0.79	1.46
	Other Oxides	0.06	0.03	0.08	0.16	0.10	0.23
	Apatite	0.74	0.47	0.95	0.51	0.27	0.76
	Calcite	2.33	1.69	2.83	2.06	1.43	2.71
	Other Carbonates	0.38	0.30	0.44	0.12	0.09	0.16
	Other	0.08	0.05	0.10	0.05	0.02	0.08
	Total	100.0	100.0	100.0	100.0	100.0	100.0

3.2. Copper Deportment

The copper deportment of the sulphide and oxide composites are presented in Table 7 and Table 8. For the sulphide composite copper in chalcopyrite and bornite accounts for 38.5% and 59.9% respectively, for a total of 98.4% indicating high copper recovery in flotation while copper in sulphides for the oxide composite is only 14.6%. Most of the copper in the oxide composite is in malachite/azurite (50.9%), Cu-bearing Fe hydroxide (16.7%), and Cu-bearing silicate (13.7%).

Table 7: Copper Deportment – Sulphide

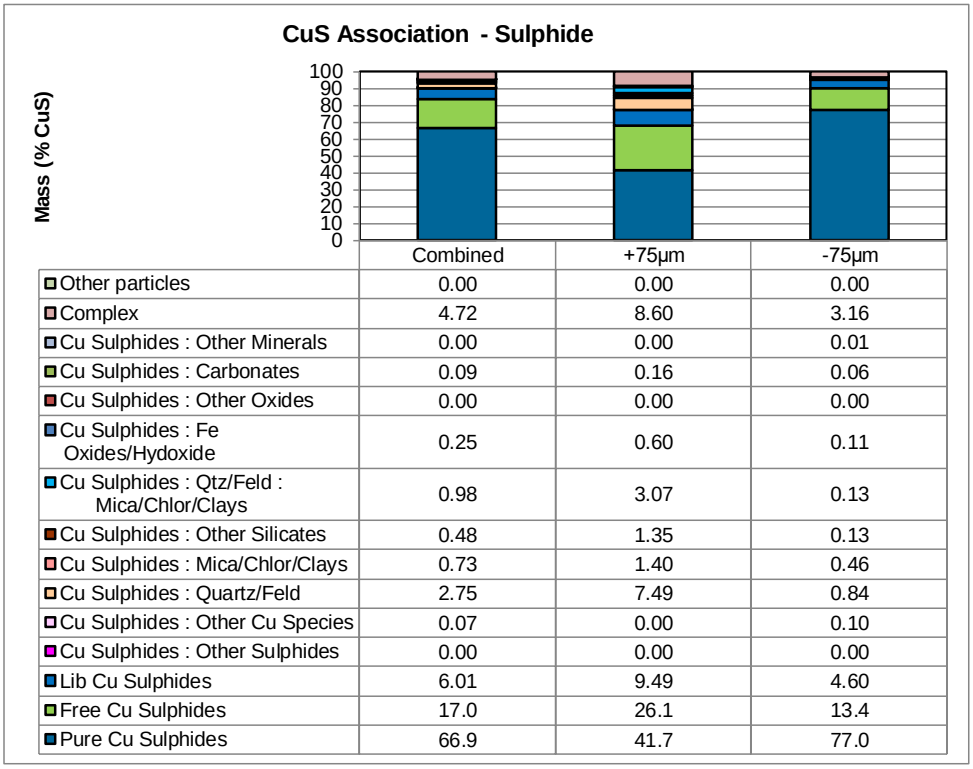
Mineral Name	Combined	+75µm	-75µm
Chalcopyrite	38.5	41.1	37.5
Bornite	59.9	57.2	61.0
Chalcocite/Digenite	1.06	1.42	0.92
Other Sulphides	0.08	0.12	0.06
Malachite/Azurite	0.00	0.00	0.00
Chrysocolla	0.00	0.00	0.00
Delafossite	0.00	0.00	0.00
Cu Oxide and Cu Metal	0.00	0.00	0.00
Cu-Bearing Fe Hydroxide	0.03	0.05	0.03
Cu-Bearing Silicate (chlorite)	0.36	0.02	0.49
Clays	0.02	0.04	0.02
Fe Oxide/Hydroxide	0.03	0.08	0.01
Other	0.00	0.00	0.00
Total	100.0	100.0	100.0

Table 8: Copper Deportment – Oxide

Mineral Name	Combined	+75µm	-75µm
Chalcopyrite	9.73	9.11	10.1
Bornite	1.82	2.00	1.71
Chalcocite/Digenite	3.02	3.78	2.59
Other Sulphides	0.04	0.03	0.04
Malachite/Azurite	50.9	62.3	44.4
Chrysocolla	1.25	0.60	1.62
Delafossite	2.28	2.48	2.17
Cu Oxide and Cu Metal	0.07	0.11	0.04
Cu-Bearing Fe Hydroxide	16.7	12.2	19.3
Cu-Bearing Silicate (chlorite)	13.7	6.87	17.5
Clays	0.30	0.34	0.28
Fe Oxide/Hydroxide	0.00	0.00	0.01
Other	0.22	0.15	0.27
Total	100.0	100.0	100.0

3.3. Copper Sulphides Liberation and Association

The liberation and association characteristics of copper sulphides are summarized in Figure 1 and Figure 2. At the sizes examined, overall copper sulphide liberation was high at 89.9% for the sulphide composite and 80% for the oxide composite.

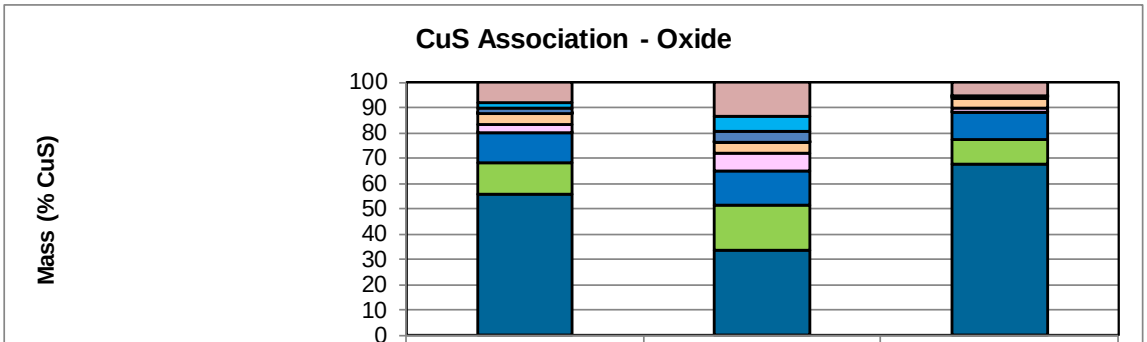


	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	4.72	8.60	3.16
Cu Sulphides : Other Minerals	0.00	0.00	0.01
Cu Sulphides : Carbonates	0.09	0.16	0.06
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Fe Oxides/Hydoxide	0.25	0.60	0.11
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.98	3.07	0.13
Cu Sulphides : Other Silicates	0.48	1.35	0.13
Cu Sulphides : Mica/Chlor/Clays	0.73	1.40	0.46
Cu Sulphides : Quartz/Feld	2.75	7.49	0.84
Cu Sulphides : Other Cu Species	0.07	0.00	0.10
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Lib Cu Sulphides	6.01	9.49	4.60
Free Cu Sulphides	17.0	26.1	13.4
Pure Cu Sulphides	66.9	41.7	77.0

Normalized Mass of CuS Across Fraction (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Pure Cu Sulphides	66.9	41.7	77.0
Free Cu Sulphides	17.0	26.1	13.4
Lib Cu Sulphides	6.01	9.49	4.60
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Cu Sulphides : Other Cu Species	0.07	0.00	0.10
Cu Sulphides : Quartz/Feld	2.75	7.49	0.84
Cu Sulphides : Mica/Chlor/Clays	0.73	1.40	0.46
Cu Sulphides : Other Silicates	0.48	1.35	0.13
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.98	3.07	0.13
Cu Sulphides : Fe Oxides/Hydoxide	0.25	0.60	0.11
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Carbonates	0.09	0.16	0.06
Cu Sulphides : Other Minerals	0.00	0.00	0.01
Complex	4.72	8.60	3.16
Other particles	0.00	0.00	0.00
Total	100.0	100.0	100.0
Liberated	89.9	77.3	95.0

Figure 1: Copper Sulphide Liberation and Association (Normalized)



	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	8.16	13.4	5.30
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Cu Sulphides : Carbonates	2.13	5.85	0.10
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Fe Oxides/Hydoxide	2.00	4.41	0.68
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.10	0.23	0.02
Cu Sulphides : Other Silicates	0.01	0.00	0.02
Cu Sulphides : Mica/Chlor/Clays	0.20	0.08	0.27
Cu Sulphides : Quartz/Feld	3.85	4.33	3.59
Cu Sulphides : Other Cu Species	3.47	6.75	1.67
Cu Sulphides : Other Sulphides	0.03	0.00	0.04
Lib Cu Sulphides	11.8	13.8	10.8
Free Cu Sulphides	12.5	17.3	9.91
Pure Cu Sulphides	55.7	33.8	67.6

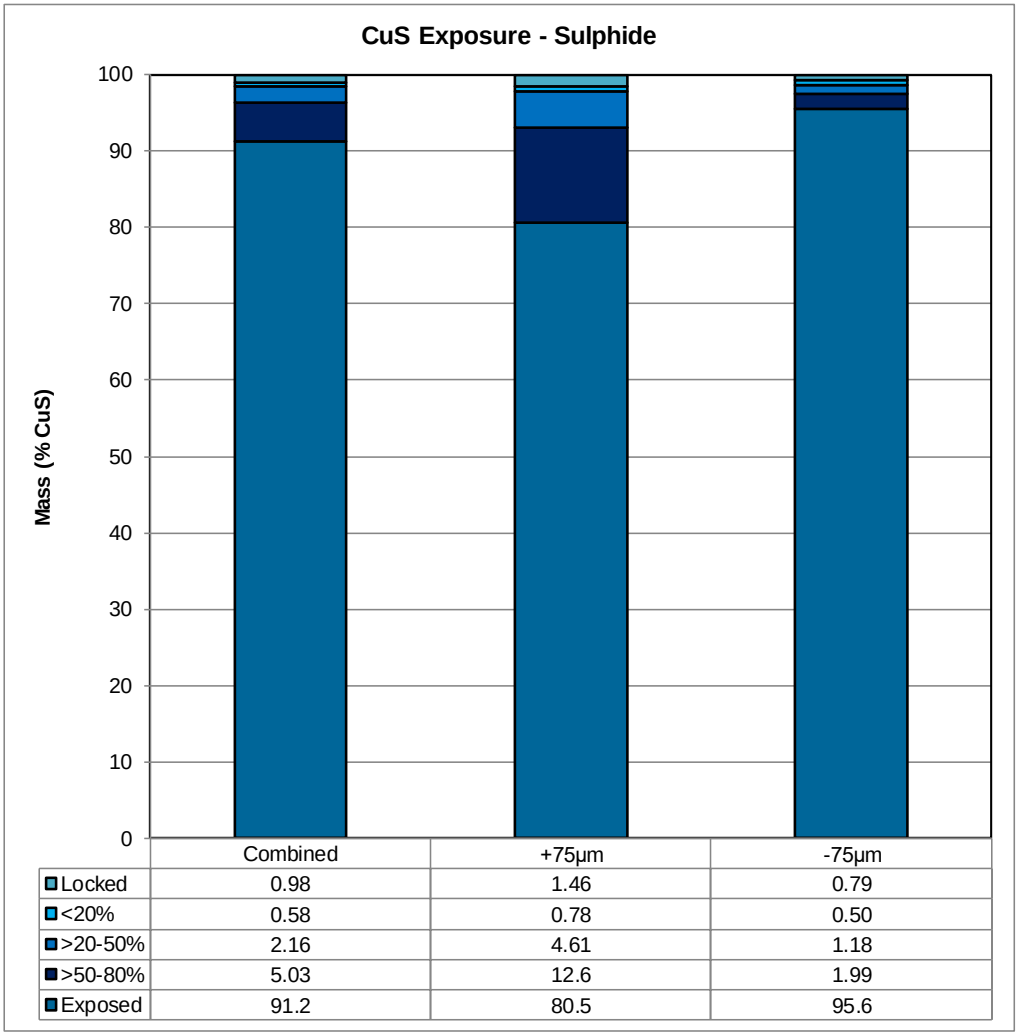
Normalized Mass of CuS Across Fraction (Oxide)

Mineral Name	Combined	+75µm	-75µm
Pure Cu Sulphides	55.7	33.8	67.6
Free Cu Sulphides	12.5	17.3	9.91
Lib Cu Sulphides	11.8	13.8	10.8
Cu Sulphides : Other Sulphides	0.03	0.00	0.04
Cu Sulphides : Other Cu Species	3.47	6.75	1.67
Cu Sulphides : Quartz/Feld	3.85	4.33	3.59
Cu Sulphides : Mica/Chlor/Clays	0.20	0.08	0.27
Cu Sulphides : Other Silicates	0.01	0.00	0.02
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.10	0.23	0.02
Cu Sulphides : Fe Oxides/Hydoxide	2.00	4.41	0.68
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Carbonates	2.13	5.85	0.10
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Complex	8.16	13.4	5.30
Other particles	0.00	0.00	0.00
Total	100.0	100.0	100.0
Liberated	80.0	65.0	88.3

Figure 2: Copper Sulphide Liberation and Association (Normalized)

3.4. Copper Sulphide Exposure

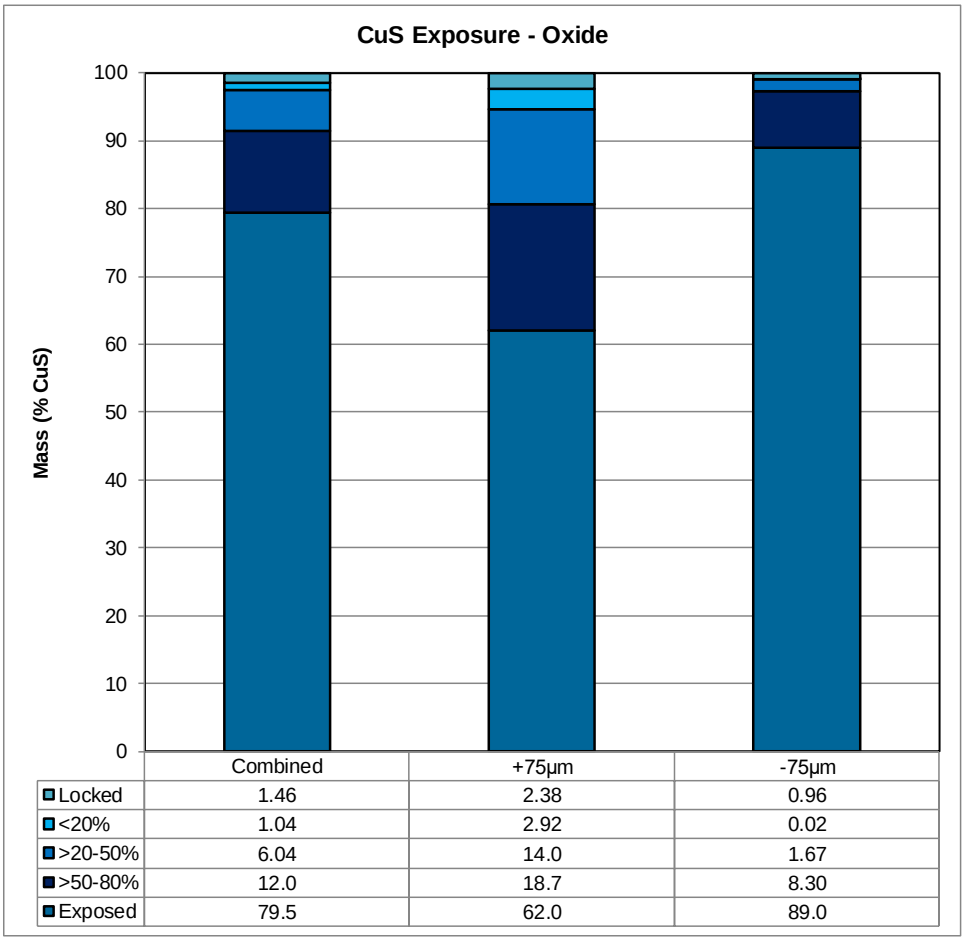
The copper sulphide exposure of the two samples is presented in Figure 3 and Figure 4. The CuS exposure is high, 91.2% for sulphide and 79.5% for oxide, indicating good CuS flotation.



Normalized Mass of CuS Across Fraction (Sulphide)

Exposure	Combined	+75µm	-75µm
Exposed	91.2	80.5	95.6
>50-80%	5.03	12.6	1.99
>20-50%	2.16	4.61	1.18
<20%	0.58	0.78	0.50
Locked	0.98	1.46	0.79
Total	100.0	100.0	100.0

Figure 3: CuS Exposure – Sulphide



	Combined	+75µm	-75µm
Locked	1.46	2.38	0.96
<20%	1.04	2.92	0.02
>20-50%	6.04	14.0	1.67
>50-80%	12.0	18.7	8.30
Exposed	79.5	62.0	89.0

Normalized Mass of CuS Across Fraction (Oxide)

Exposure	Combined	+75µm	-75µm
Exposed	79.5	62.0	89.0
>50-80%	12.0	18.7	8.30
>20-50%	6.04	14.0	1.67
<20%	1.04	2.92	0.02
Locked	1.46	2.38	0.96
Total	100.0	100.0	100.0

Figure 4: CuS Exposure – Oxide

4. Metallurgical Testing

A total of 15 flotation tests were completed. The test conditions and results are summarized in Table 9 and Table 10, with details included in Appendix B.

Table 9: Summary Flotation Conditions

Test No.	Primary Grind		Cu Rougher Flotation					Regrind Grind		Cu Cleaner Flotation					Comments
	K_{80}, µm	pH	A-OX100	Na_2S, g/t	PAX, g/t	3418A, g/t	pH	K_{80}, µm	pH	A-OX100	Na_2S, g/t	PAX, g/t	3418A, g/t	pH	
Suphide-F1	130	8.9			30	30	10								Rougher
Suphide-F2	202	9.0			25	25	9.0								Rougher
Suphide-F3	90	9.0			25	25	9.0								Rougher
Suphide-F4	130	8.9			25	25	8.9	33	8.8			15	15	10.5-11	Cleaner
Suphide-F5	202	9.0			25	25	9.0	30	8.8			15	15	10.5-11	Cleaner
Oxide-F1	151	8.7		800	55	25	10								Rougher
Oxide-F2	132	8.5	150	1000	55	30	10								Rougher
Oxide-F3	118	8.6	100	1000	55	40	10								Rougher
Oxide-F4	119	8.6	100	1000	55	40	10	23.5	9.6	30	100	15	15	11	Cleaner
Oxide-F5	119	8.7	10	1000	55	40	10	28.9	9.7		100	15	15	11	Cleaner
Blend-F1 (50:50)	135	8.7	100	350	40	45	8.8								Rougher
Blend-F2 (50:50)	140	8.8	100	500	40	45	9.8								Rougher
Blend-F3 (50:50)	137	8.7	100	500	40	45	9.6	31.5	9.3	30	100	15	15	11	Cleaner
Blend-F4 (50:50)	137	8.9	5	500	40	45	9.8	27.8	9.3		100	15	15	11	Cleaner
Blend LCT1 (60:40)	140	8.8	5	500	40	45	9.6	30.8	9.5		100	15	15	11	LCT

Table 10: Summary Flotation Results

Test No.	Mass Pull		Rougher Conc Grade				Rougher Conc Recovery				Cleaner Mass Pull		Cleaner Conc Grade				Cleaner Conc Recovery			
	g	%	Cu, %	S, %	Au, g/t	Ag, g/t	Cu, %	S, %	Au, g/t	Ag, g/t	g	%	Cu, %	S, %	Au, g/t	Ag, g/t	Cu, %	S, %	Au, g/t	Ag, g/t
Suphide-F1	162.4	8.17	11.6	8.08	2.57	35	97.2	97.3	82.0	86.3										
Suphide-F2	183.5	9.31	10.2	7.02	2.24	28.7	96.4	96.0	82.2	85.5										
Suphide-F3	194.2	9.87	9.70	5.78	2.29	29.1	98.9	98.4	75.8	86.4										
Suphide-F4	162.8	8.33	11.87	8.44	2.29	34.1	98.2	97.5	77.6	86.1	43.2	2.21	42.7	30.5	7.67	117.0	93.7	93.4	69.0	78.4
Suphide-F5	157.3	8.02	11.74	7.72	2.32	36.2	96.1	98.5	74.3	86.3	42.0	2.14	41.4	27.1	7.78	123.0	90.4	92.4	66.5	78.3
Oxide-F1	149.6	7.65	4.36	0.68	1.58	16	55.5	84.9	59.2	57.1										
Oxide-F2	191.5	9.74	3.60	0.57	1.70	14	59.9	86.1	72.4	63.1										
Oxide-F3	175.2	8.97	3.87	0.62	1.55	15.8	60.4	85.9	68.6	63.3										
Oxide-F4	205.1	10.6	3.54	0.55	1.23	14.5	61.7	86.7	59.4	68.2	28.0	1.45	17.6	3.09	7.14	69.3	41.9	66.5	46.9	44.6
Oxide-F5	189.4	9.69	3.64	0.51	1.50	13.4	58.3	73.4	66.8	56.7	18.0	0.92	26.2	4.45	13.6	93.2	39.8	60.4	57.5	37.4
Blend-F1 (50:50)	181.7	9.16	7.21	3.90	2.05	23.4	82.9	97.5	83.8	79.8										
Blend-F2 (50:50)	187.6	9.51	7.16	3.89	2.24	22.1	84.3	97.6	79.7	82.3										
Blend-F3 (50:50)	250.0	12.6	5.25	2.36	1.71	17.9	84.4	94.5	80.5	83.8	40.0	2.02	26.3	12.3	7.41	82.0	67.6	78.9	55.8	61.5
Blend-F4 (50:50)	153.6	7.78	8.31	4.54	2.57	26.6	82.4	95.0	73.0	78.9	28.6	1.45	40.8	23.3	12.4	120	75.3	90.8	65.7	66.2
Blend LCT1 (60:40)											99.4	1.69	40.1	23.6	10.6	104	82.0	92.2	70.1	68.6

4.1. Sulphide Ore

4.1.1. Rougher Flotation Testing

Three rougher flotation tests were completed on the sulphide ore at a primary grind size P_{80} of 130 µm, 202 µm, and 90 µm respectively. PAX and 3418A were used as collectors. Test sulphide F1 was performed at pH 10, while sulphide F2 and sulphide F3 were performed at natural pH of 9 approximately. The results are presented in Figure 5.

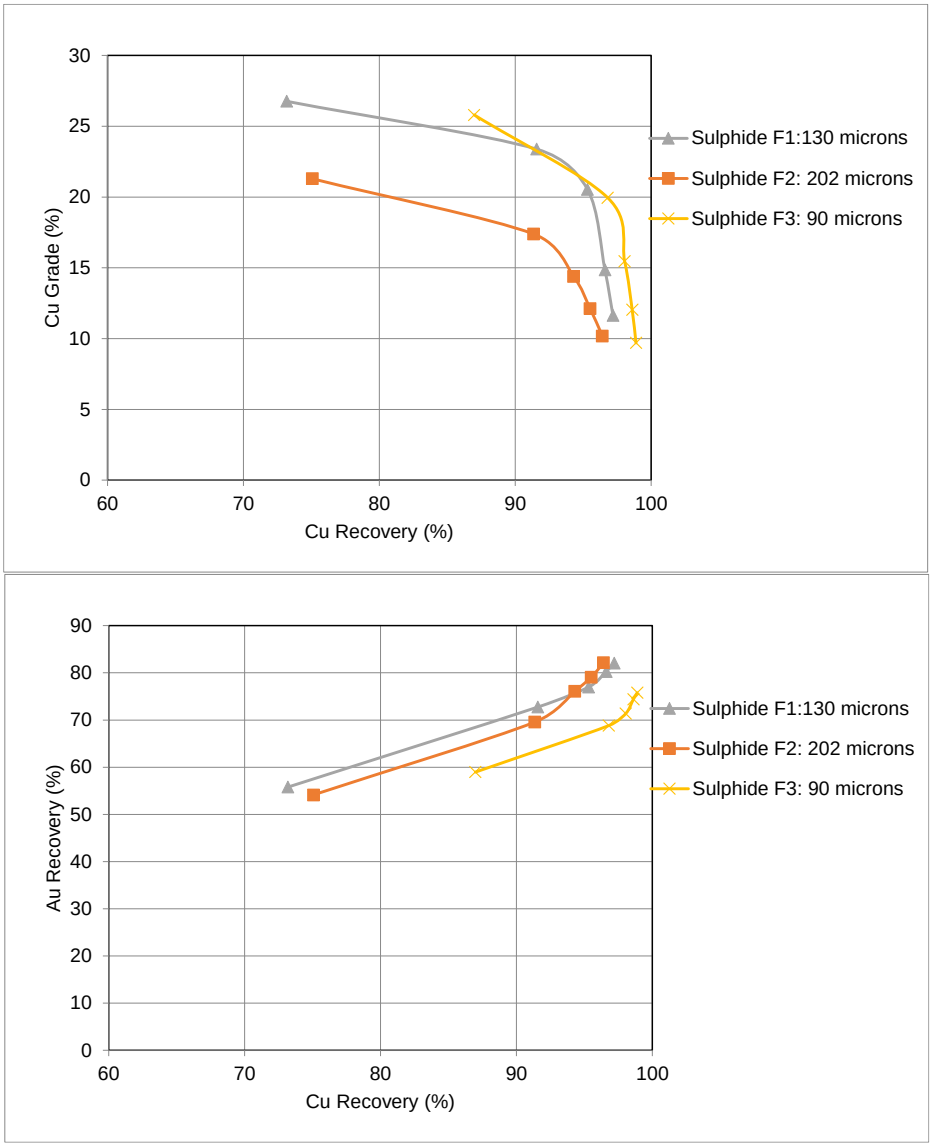


Figure 5: Rougher Flotation – Sulphide Ore

Very good copper and gold recoveries were obtained from the tests. The copper and gold recoveries were 97.2% and 82.0% for sulphide F1, 96.4% and 82.2% for sulphide F2, and 98.9% and 75.3% for sulphide F3. Higher copper recovery was achieved at finer primary grind size (Sulphide F3 at P_{80} of 90 µm).

4.1.2. Cleaner Flotation Testing

Two cleaner flotation tests were completed and the primary grind size P_{80} was 130 µm and 202 µm while the regrind size P_{80} was 33 µm and 30 µm, respectively. Two stages of copper cleaning were employed and the collectors PAX and 3418A were used in both rougher and cleaner stages. The results are plotted in Figure 6.

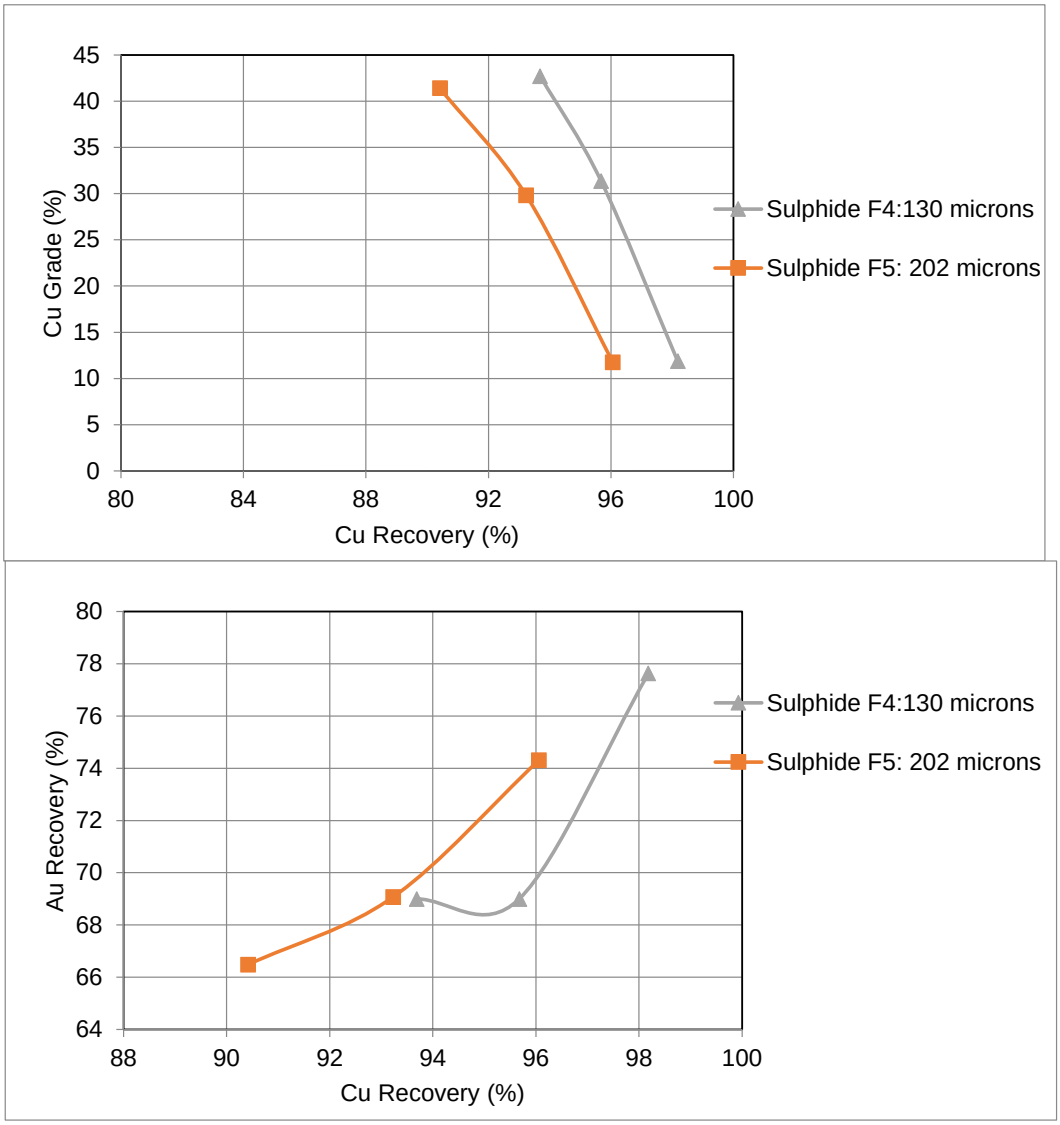


Figure 6: Cleaner Flotation – Sulphide Ore

Excellent cleaner flotation results were obtained from both tests. The copper grade and recovery were high at 93.7% copper recovery and 42.7% Cu grade for sulphide F4, and at 90.4% copper recovery and 41.1% Cu grade for sulphide F5. The gold recovery to the cleaner concentrate was 69.0% and 66.5%, respectively. Higher copper and gold recoveries were achieved at finer primary grind size (sulphide F4 vs sulphide F5).

4.2. Oxide Ore

4.2.1. Rougher Flotation Testing

Three rougher flotation tests were completed on the oxide ore at primary grind P_{80} of 151 µm, 132 µm, and 118 µm, respectively. Sodium sulphide (Na_2S) was used in all three tests for sulphidization while an oxide copper collector A-OX100 were used in Oxide-F2 and Oxide-F3 in addition to collectors PAX and 3418A. The results are presented in Figure 7.

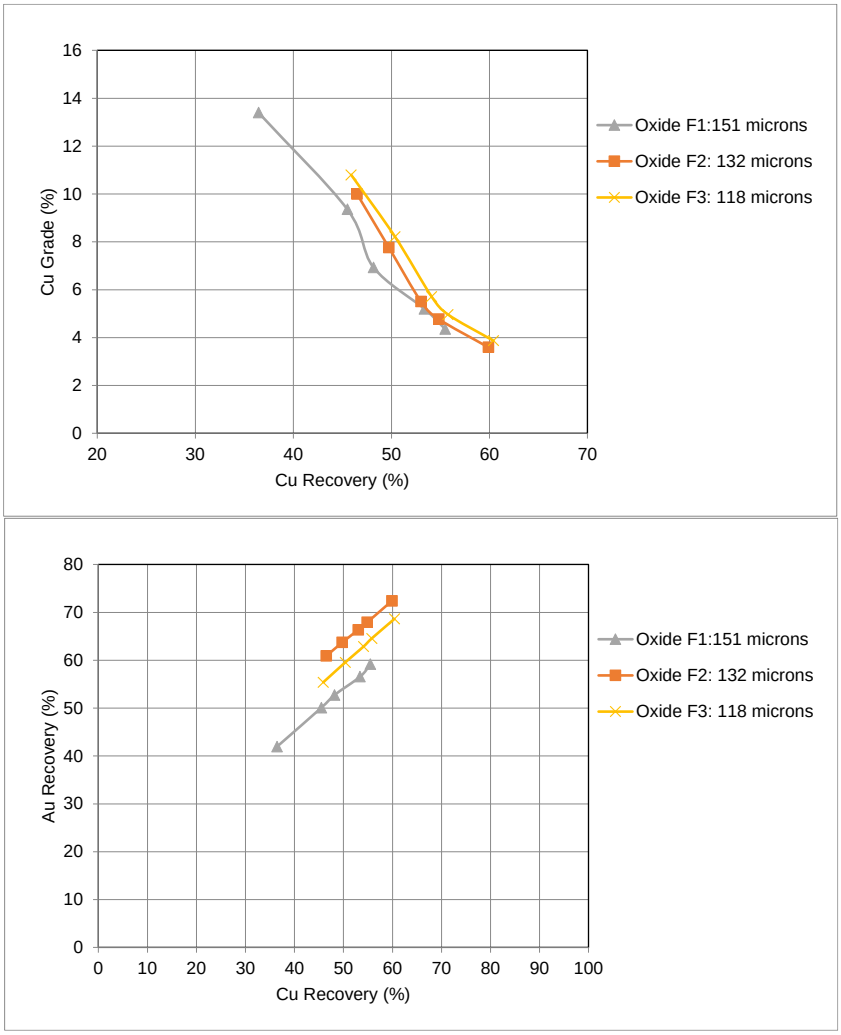


Figure 7: Rougher Flotation – Oxide Ore

Good copper and gold recoveries were obtained from the oxide sample. The copper and gold recoveries were 55.5% and 59.2% for oxide F1, 59.9% and 72.4% for oxide F2, and 60.4% and 68.6% for oxide F3 respectively. The addition of oxide collector A-OX100 improved copper and gold flotation.

4.2.2. Cleaner Flotation Testing

Two cleaner flotation tests were completed and the primary grind size P_{80} was 119 µm while the regrind size P_{80} was 23.5 µm and 28.9 µm, respectively. Two stages of copper cleaning were employed. Na_2S and A-OX100 were used to improve oxide copper flotation while PAX and 3418A were used as collectors. The results are plotted in Figure 8.

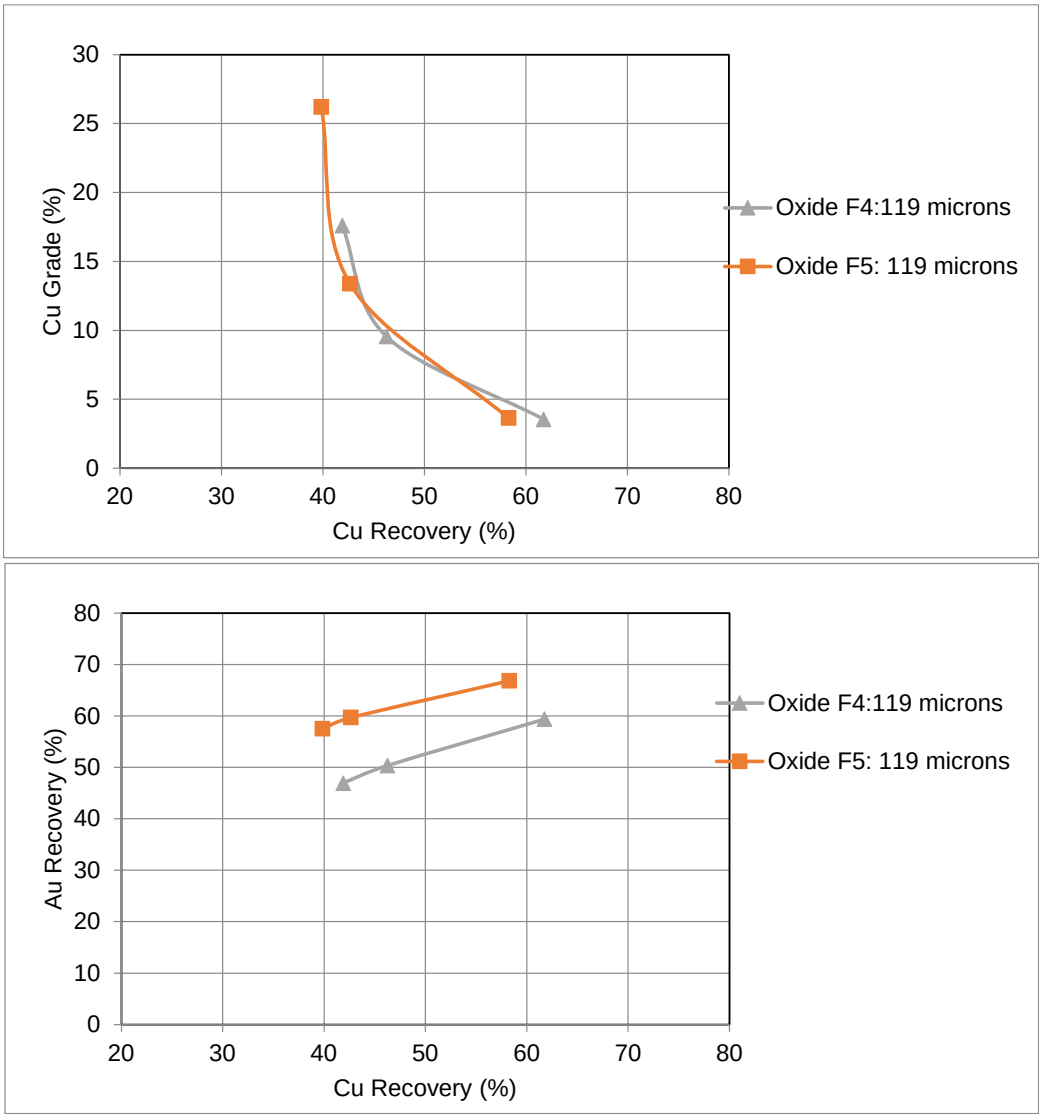


Figure 8: Cleaner Flotation – Oxide Ore

The copper grade was 17.6% at 41.9% copper recovery for oxide-F4 while the copper grade was 26.2% at 39.8% copper recovery for oxide F5. Higher copper grade was obtained from oxide F2 due to much reduced A-OX100 addition. Higher A-OX100 resulted in higher mass pull and poor selectivity. The gold recovery to the cleaner concentrate was 46.9% and 57.5%, respectively.

4.3. Blend Ore

4.3.1. Rougher Flotation Testing

Two blend rougher flotation tests were completed. The ratio of the sulphide to oxide was 1:1. The sulphidization reagent Na_2S was added in rougher three in blend F1 while it was added in rougher one and rougher three in blend F2 to test its impact on flotation. The results are plotted in Figure 9.

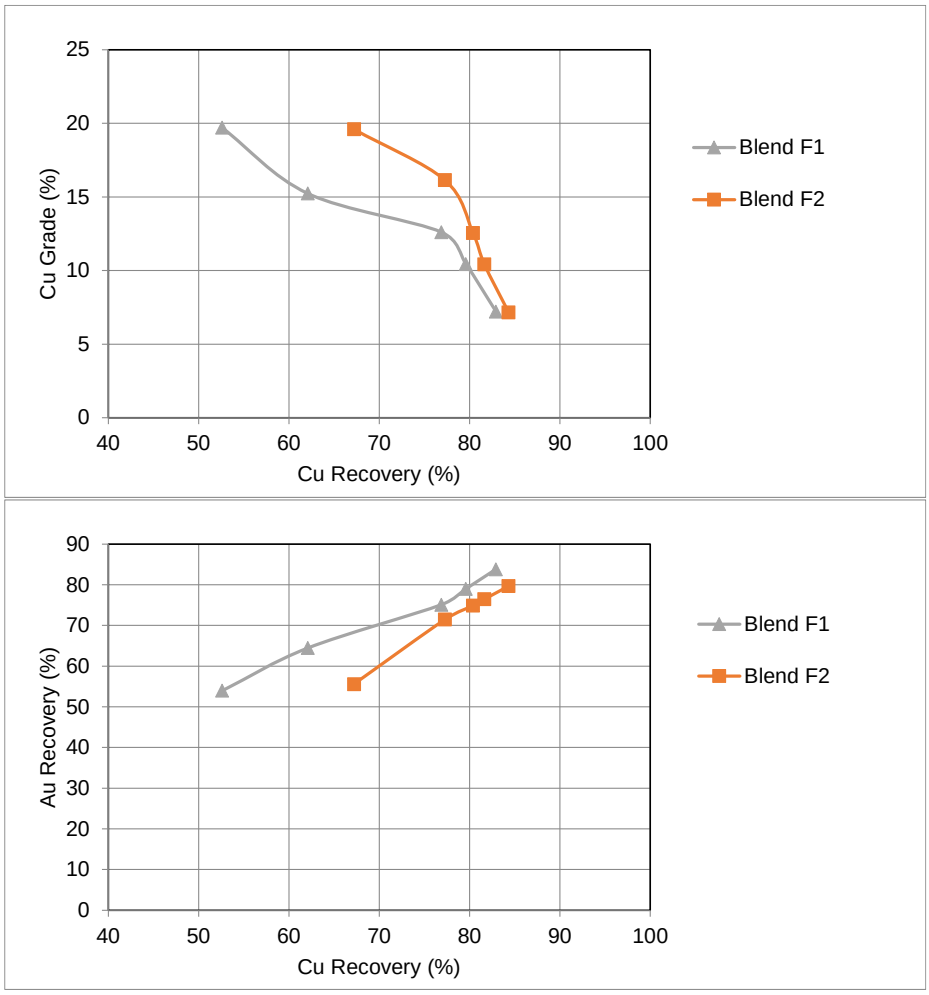


Figure 9: Rougher Flotation – Blend Ore

The copper rougher recovery was 82.9% for blend F1 and 84.3% for blend F2. The addition of sulphidization reagent Na_2S to the very beginning of the flotation circuit improved copper recovery.

4.3.2. Cleaner Flotation Testing

Two blend cleaner flotation tests were completed. It was found that the oxide copper collector A-OX100 impacted oxide flotation and resulted in poor selectivity in oxide flotation. Its dosage in blend cleaner flotation was reduced from 130 g/t in blend F3 to 5 g/t in blend F4, which improved copper grade and recovery significantly. The copper concentrate grade was 26.3% at 67.6% copper recovery for blend F3 while the copper concentrate grade improved to 40.8% at 75.3% copper recovery for blend F4.

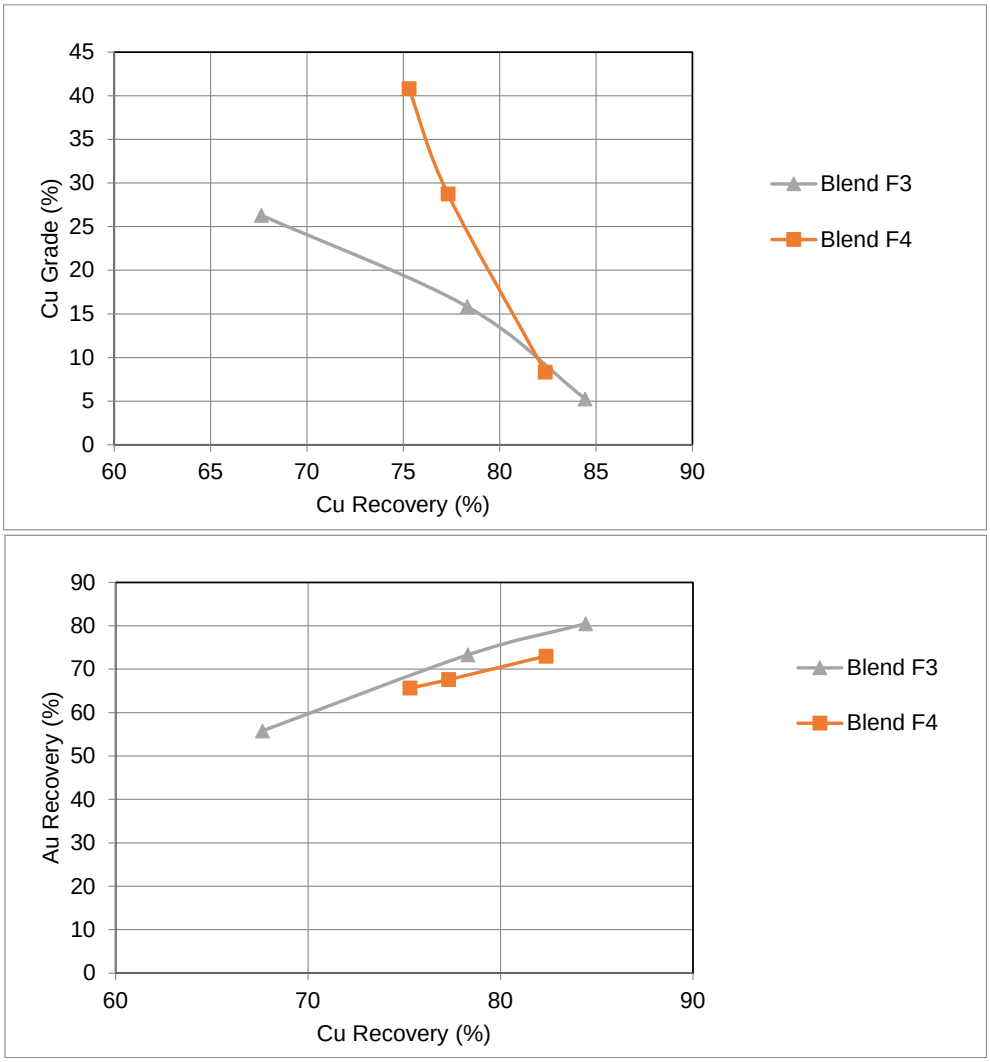


Figure 10: Cleaner Flotation – Blend Ore

5. Locked Cycle Flotation Testing

One locked cycle test was completed on the blend ore (Sulphide:Oxide = 60:40) with the flowsheet presented in Figure 11, using Na2S as sulphidization reagent, A-OX100 as oxide copper collector, and PAX/3418 as sulphide collectors, natural pH at rougher and lime to cleaner to pH 11. The test details are appended.

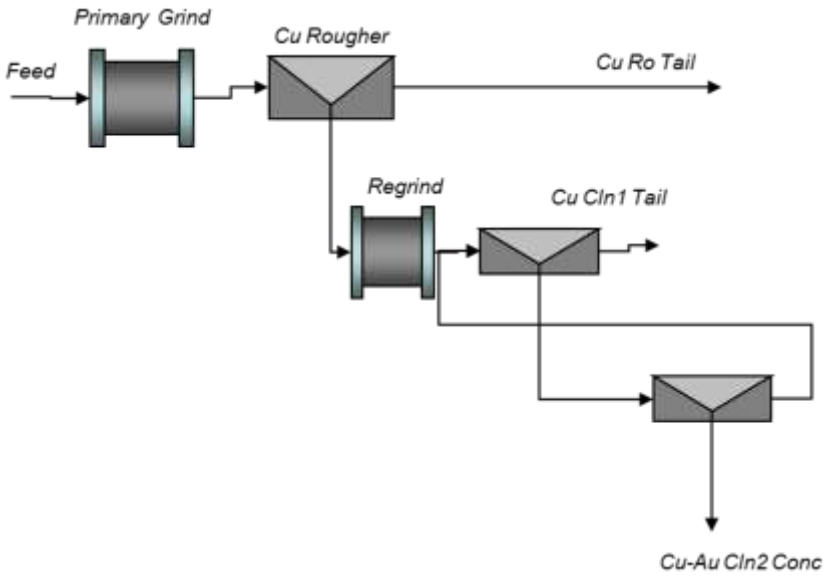


Figure 11: Locked Cycle Flotation Test Flowsheet

Very good flotation results were obtained from the locked cycle test and the results are summarized in Table 11. The test was well stabilized, and the projected metallurgy based on the last three cycles was 40.1% Cu and 10.6 g/t Au at 82% copper recovery and 70.1% gold recovery.

Table 11: Summary Results of Locked Cycle Test

Product	Weight		Assays %, g/t					% Distribution			
	g	%	Cu	S	Au	Ag	Cu-H_2SO_4	Cu	S	Au	Ag
LCT1-A Cu Cln2 Conc	31.5	0.27	41.2	24.9	9.69	119		13.2	15.2	10.6	12.0
LCT1-B Cu Cln2 Conc	32.7	0.28	41.1	24.1	9.24	115		13.6	15.2	10.5	12.1
LCT1-C Cu Cln2 Conc	33.8	0.29	40.2	24.1	8.69	105		13.8	15.8	10.2	11.4
LCT1-D Cu Cln2 Conc	33.2	0.28	39.8	24.3	9.89	103		13.4	15.6	11.4	11.0
LCT1-E Cu Cln2 Conc	33.1	0.28	40.6	23.5	12.4	106		13.6	15.0	14.3	11.2
LCT1-F Cu Cln2 Conc	33.1	0.28	39.8	23.1	9.57	103	5.29	13.4	14.8	11.0	10.9
LCT1-F Cu Cln2 Tail	19.7	0.17	1.38	0.70	0.49	8		0.3	0.3	0.3	0.5
LCT1-A Cu Cln1 Tail	160.9	1.36	0.49	0.14	0.19	3		0.8	0.4	1.1	1.5
LCT1-B Cu Cln1 Tail	178.4	1.51	0.51	0.17	0.20	4		0.9	0.6	1.2	2.3
LCT1-C Cu Cln1 Tail	172.3	1.46	0.55	0.16	0.20	3		1.0	0.5	1.2	1.7
LCT1-D Cu Cln1 Tail	148.3	1.25	0.51	0.15	0.21	3		0.8	0.4	1.1	1.4
LCT1-E Cu Cln1 Tail	157.0	1.33	0.51	0.15	0.21	3		0.8	0.5	1.1	1.5
LCT1-F Cu Cln1 Tail	155.8	1.32	0.53	0.18	0.21	4		0.8	0.5	1.1	2.0
LCT1-A Cu Ro Tail	1778.4	15.03	0.13	0.03	0.08	0.6		2.3	1.0	5.0	3.4
LCT1-B Cu Ro Tail	1762.0	14.89	0.13	0.03	0.06	0.6		2.3	1.0	3.7	3.4
LCT1-C Cu Ro Tail	1789.2	15.12	0.14	0.02	0.06	0.6		2.5	0.7	3.7	3.4
LCT1-D Cu Ro Tail	1769.8	14.96	0.12	0.02	0.06	0.6		2.2	0.7	3.7	3.4
LCT1-E Cu Ro Tail	1779.8	15.04	0.12	0.02	0.07	0.6		2.2	0.7	4.3	3.4
LCT1-F Cu Ro Tail	1763.4	14.90	0.12	0.03	0.07	0.6	0.081	2.1	1.0	4.3	3.4
Head (calc.)	11832.4	100	0.83	0.44	0.24	2.64		100	100	100	100
(direct)			0.80	0.43	0.24	2.76	0.245				

Projected metallurgy - Blend LCT1 based on cycles 4-6

Product	Weight		Assays %, g/t					% Distribution			
	g	%	Cu	S	Au	Ag		Cu	S	Au	Ag
Cu Cln2 Conc	99.4	1.69	40.1	23.6	10.6	104		82.0	92.2	70.1	68.6
Cu Cln1 Tail	461.1	7.9	0.52	0.16	0.21	3.34		4.9	2.9	6.4	10.2
Cu Ro Tail	5313.0	90.5	0.12	0.02	0.07	0.60		13.1	4.9	23.5	21.2
Feed	5873.5	100	0.83	0.43	0.26	2.56		100	100	100	100

Stability Check

Cycle	Cu	S	Au	Ag
A	98	100	100	102
B	101	101	93	106
C	104	102	91	99
D	98	100	97	95
E	100	97	119	97
F	98	98	99	98
ave 3-6	100	99	101	97
ave 4-6	99	99	105	97
ave 5-6	99	98	109	98

The final concentrate and rougher tail from cycle F were submitted for product characterization and the results are summarized in Table 12. The concentrate was very clean and the contents of penalty elements such as As, Cd, Cr, and Pb were low.

Table 12: Concentrate and Tail Characterization

Sample ID	Blend-LCT1-F Cu Cln2 Conc	Blend-LCT1-F Cu Ro Tail
Al g/t	10600	89500
As g/t	< 30	< 30
Ba g/t	251	1270
Be g/t	< 0.9	< 0.9
Bi g/t	< 70	< 70
Ca g/t	6170	39600
Cd g/t	12	< 2
Co g/t	19	19
Cr g/t	43	75
Fe g/t	184000	44200
K g/t	2320	21000
Li g/t	< 40	< 40
Mg g/t	2770	18800
Mn g/t	209	717
Mo g/t	8930	15
Na g/t	2960	32400
Ni g/t	< 30	< 30
P g/t	287	1360
Pb g/t	< 30	< 30
Sb g/t	< 10	< 10
Se g/t	182	< 30
Sn g/t	< 20	< 20
Sr g/t	89	712
Ti g/t	916	4310
Tl g/t	< 30	< 30
V g/t	57	165
Y g/t	5.4	15
Zn g/t	83	76
Cu %	39.8	0.12
S %	23.1	0.03
Au g/t	9.57	0.07
Ag g/t	103	0.6
Cu H_2SO_4 %	5.29	0.081
Hg g/t	1.7	<0.3

Conclusions and Recommendations

A test program including mineralogy and flotation was completed on samples from the Carmacks project. The flotation test program included testwork on sulphide, oxide, and blend ores.

- The sulphide ore assayed 0.92% Cu, 0.67% S, and 0.24 g/t Au. Gold and copper head grades calculated from the flotation test assays agreed well with the direct head assays.

- The oxide ore assayed, 0.60% Cu, 0.06% S, and 0.25-0.82 g/t Au indicating that nugget gold may exist. However, the gold head grade calculated from the flotation tests was consistently between 0.20 g/t to 0.23 g/t with an average of 0.21 g/t.

- Sulphide flotation recovered 93.7% of copper and 69.0% of gold at 42.7 % Cu and 7.7 g/t Au grade (Sulphide F4) while oxide flotation recovered 39.8% of copper and 57.5% of gold at 26.2% Cu and 13.6 g/t Au grade.

- Blend batch flotation recovered 75.3% of copper and 65.7% of gold at 40.8 % Cu and 12.4 g/t Au grade (Blend F4).

- Locked cycle flotation on blend sample recovered 82.0% of copper and 70.1% of gold at 40.1% Cu and 10.6 g/t Au grade (Blend LCT1).

- Flotation optimization and an economical evaluation of the target copper grade versus recovery is recommended in future testwork.

Appendix A – Mineralogy Results

TIMA DATA

prepared for:

SGS Met Ops (Carmacks Sulphide & Oxide)

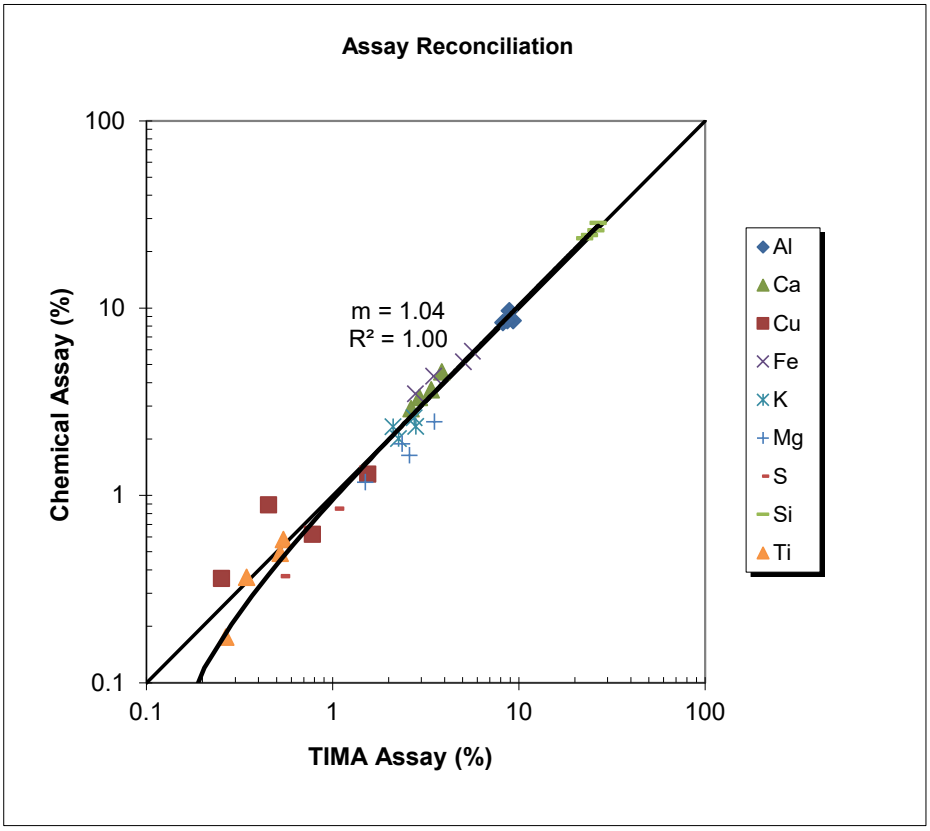
Project CA20M-00000-211-19248-01
MI7004-JUN22
July 21, 2022

Prepared by:

Hanna Horsch (Sr. Mineralogist) & Landon Kapusianyk (Jr. Mineralogist)

Carmacks Sulphide & Oxide Min
19248-01
MI7004-JUN22

Assay Reconciliation



Sample	Sulphide		Oxide	
Element	**+75µm**	**-75µm**	**+75µm**	**-75µm**
Al (TIMA)	8.88	8.20	9.31	8.66
Al (Chemical)	9.69	8.38	9.73	8.58
Ca (TIMA)	2.92	3.85	2.63	3.38
Ca (Chemical)	3.34	4.58	2.91	3.67
Cu (TIMA)	0.78	1.54	0.25	0.45
Cu (Chemical)	0.62	1.30	0.36	0.89
Fe (TIMA)	3.49	5.62	2.79	5.03
Fe (Chemical)	4.33	5.89	3.48	5.16
K (TIMA)	2.12	2.26	2.75	2.80
K (Chemical)	2.32	2.01	2.60	2.33
Mg (TIMA)	2.36	3.52	1.50	2.58
Mg (Chemical)	1.89	2.48	1.18	1.64
S (TIMA)	0.53	1.04	0.06	0.09
S (Chemical)	0.37	0.85	0.04	0.07
Si (TIMA)	26.0	22.6	26.7	24.0
Si (Chemical)	26.1	23.6	28.1	24.5
Ti (TIMA)	0.35	0.54	0.27	0.52
Ti (Chemical)	0.37	0.58	0.27	0.49

Carmacks Sulphide & Oxide Min
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Modals

Survey		19248-01 / MI7004-JUN22					
Project		Carmack Sulphide & Oxide Mineralogy					
Sample		Sulphide			Oxide		
Fraction		Combined	+75µm	-75µm	Combined	+75µm	-75µm
Mass Size Distribution (%)		100.0	43.9	56.1	100.0	50.4	49.6
Mineral Mass % of Phase(%)	Pyrite	0.01	0.01	0.02	0.05	0.05	0.05
	Cu Sulphides	2.53	1.65	3.21	0.13	0.09	0.16
	Other Sulphides	0.08	0.05	0.10	0.00	0.00	0.01
	Other Cu Species	0.15	0.01	0.26	2.58	1.20	3.99
	Quartz/Feldspar	57.7	67.1	50.3	69.3	77.4	61.1
	Mica/Chlorite/Clays	24.0	18.4	28.4	17.0	13.4	20.7
	Other Silicates	11.7	9.98	13.0	6.83	5.12	8.56
	Fe Oxide/Hydroxide	0.33	0.30	0.36	1.12	0.79	1.46
	Other Oxides	0.06	0.03	0.08	0.16	0.10	0.23
	Carbonates	2.71	1.99	3.27	2.19	1.52	2.86
	Other	0.82	0.52	1.06	0.56	0.29	0.84
	Total	100.0	100.0	100.0	100.0	100.0	100.0

Carmacks Sulphide & Oxide Min
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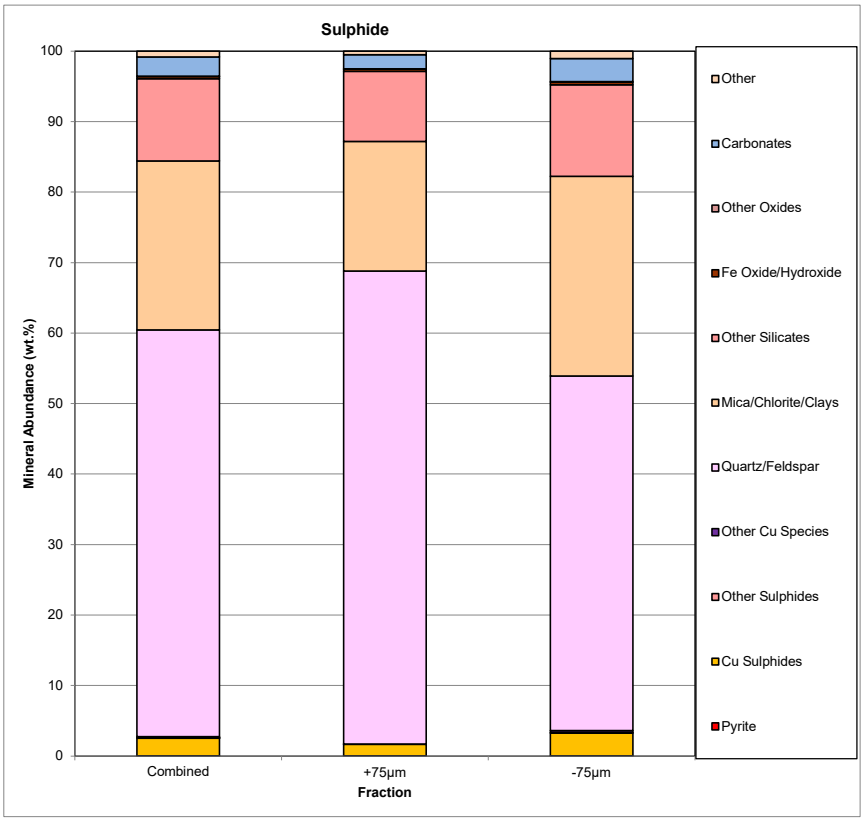
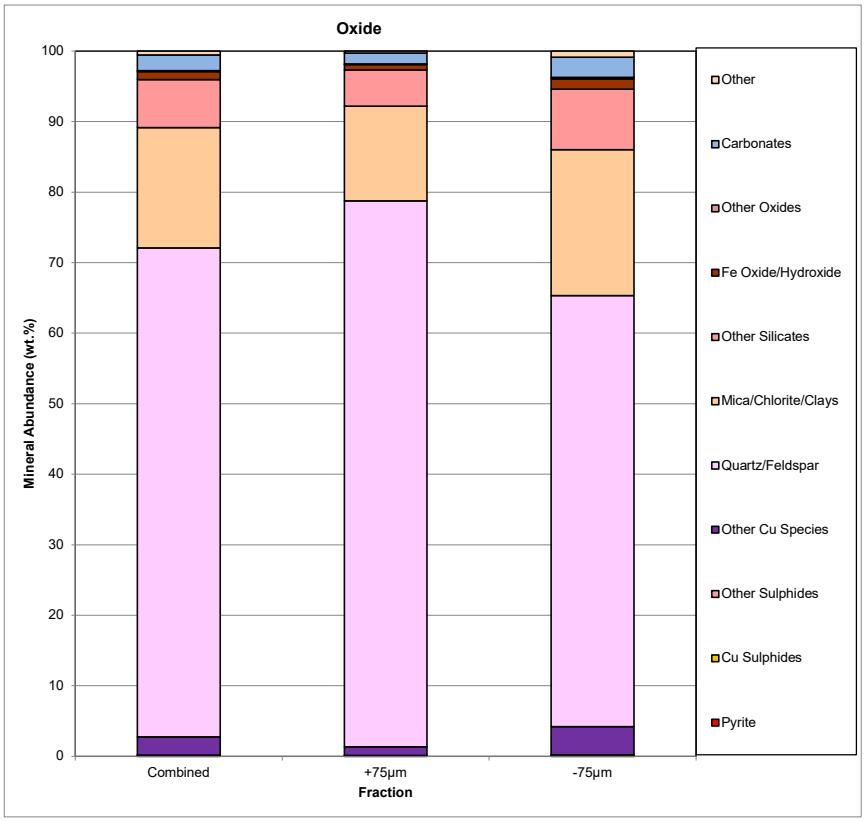
Modal Chart





Carmacks Sulphide & Oxide Min
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Modals

Survey		19248-01 / MI7004-JUN22					
Project		Carmack Sulphide & Oxide Mineralogy					
Sample		Sulphide			Oxide		
Fraction		Combined	+75µm	-75µm	Combined	+75µm	-75µm
Mass Size Distribution (%)		100.0	43.9	56.1	100.0	50.4	49.6
Mineral Mass %	Pyrite	0.01	0.01	0.02	0.05	0.05	0.05
	Chalcopyrite	1.36	0.93	1.70	0.10	0.07	0.14
	Bornite	1.15	0.71	1.49	0.01	0.01	0.01
	Chalcocite/Digenite	0.02	0.01	0.02	0.01	0.01	0.01
	Molybdenite	0.07	0.04	0.10	0.00	0.00	0.01
	Other Sulphides	0.00	0.00	0.01	0.00	0.00	0.00
	Malachite/Azurite	0.00	0.00	0.00	0.32	0.29	0.36
	Chrysocolla	0.00	0.00	0.00	0.01	0.00	0.02
	Delafossite	0.00	0.00	0.00	0.02	0.02	0.02
	Cu Oxide and Cu Metal	0.00	0.00	0.00	0.00	0.00	0.00
	Cu-Bearing Fe Hydroxide	0.00	0.00	0.00	0.57	0.30	0.86
	Cu-Bearing Silicate (chlorite)	0.15	0.01	0.26	1.65	0.60	2.72
	Quartz	6.32	6.78	5.95	8.24	8.97	7.49
	Albite	29.1	37.4	22.6	22.5	25.8	19.1
	Plagioclase	14.0	14.4	13.7	25.4	29.6	21.3
	K-Feldspar	6.92	7.09	6.78	12.0	12.0	12.0
	Anorthoclase	1.36	1.45	1.29	1.17	1.11	1.23
	Muscovite	0.42	0.54	0.32	0.34	0.39	0.30
	Biotite	13.7	12.0	15.0	10.1	9.63	10.5
	Chlorites	9.86	5.81	13.0	6.44	3.27	9.65
	Clays	0.03	0.02	0.03	0.18	0.12	0.24
	Amphiboles	10.3	8.96	11.4	6.21	4.79	7.65
	Other Silicates	1.34	1.03	1.59	0.62	0.34	0.91
	Fe Oxide/Hydroxide	0.33	0.30	0.36	1.12	0.79	1.46
	Other Oxides	0.06	0.03	0.08	0.16	0.10	0.23
	Apatite	0.74	0.47	0.95	0.51	0.27	0.76
	Calcite	2.33	1.69	2.83	2.06	1.43	2.71
	Other Carbonates	0.38	0.30	0.44	0.12	0.09	0.16
	Other	0.08	0.05	0.10	0.05	0.02	0.08
	Total	100.0	100.0	100.0	100.0	100.0	100.0

Carmacks Sulphide & Oxide Min
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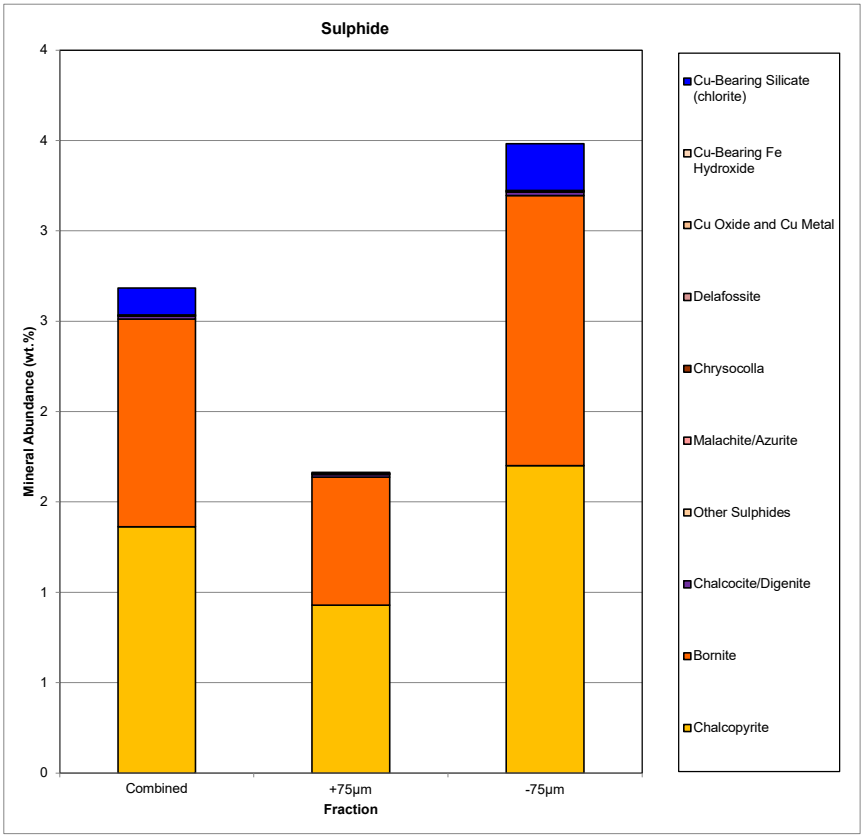
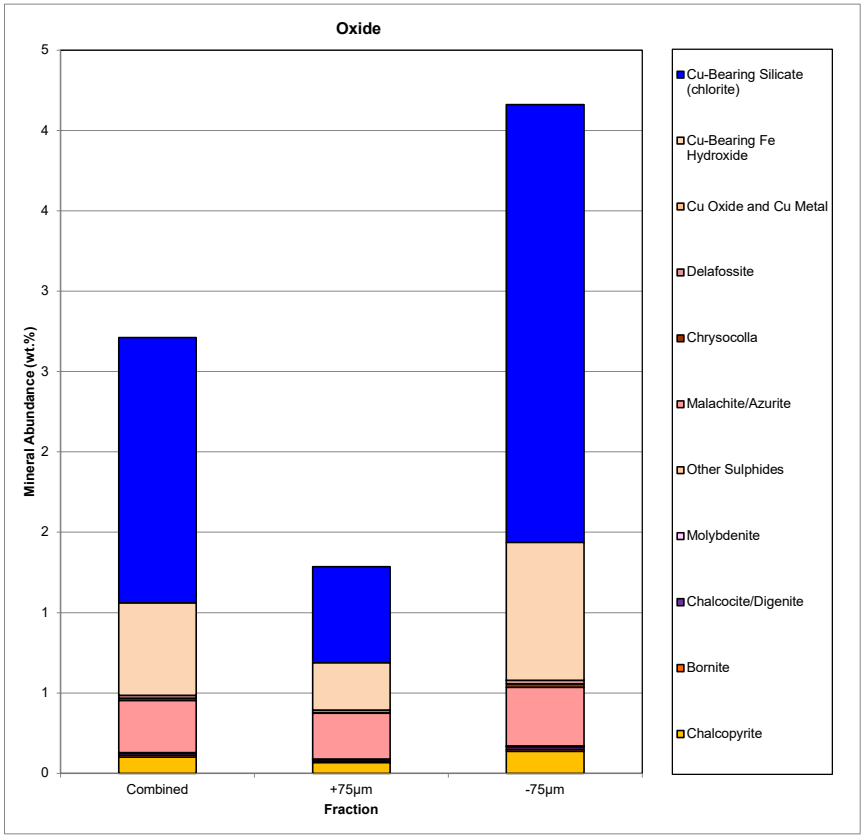
Modal Chart





Carmacks Sulphide & Oxide Min
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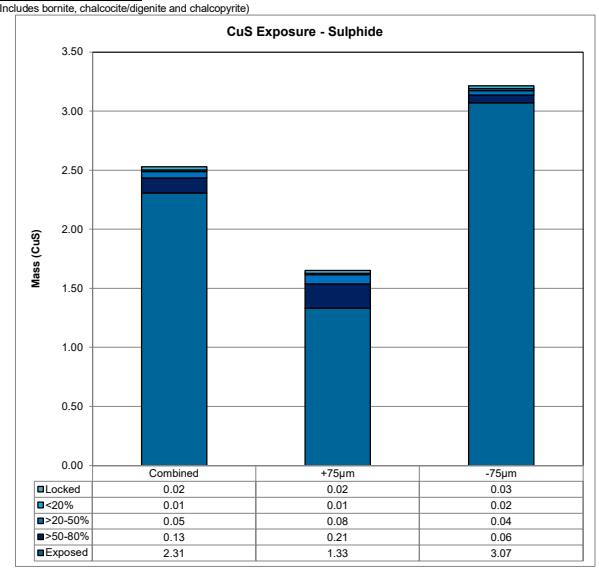
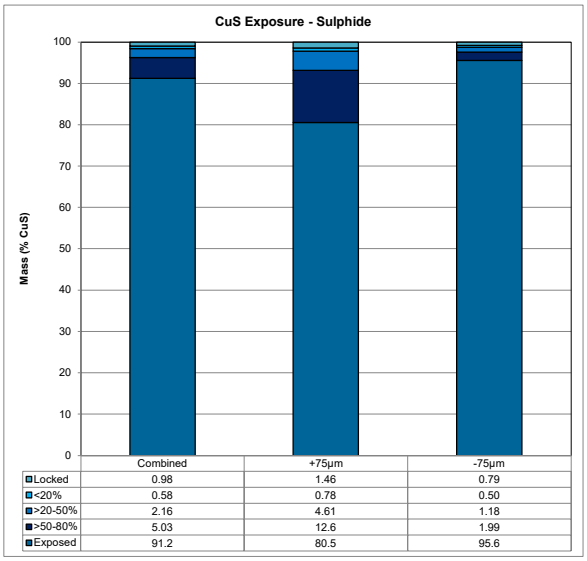
Copper Sulphides Exposure
(Includes bornite, chalcocite/digenite and chalcopyrite)



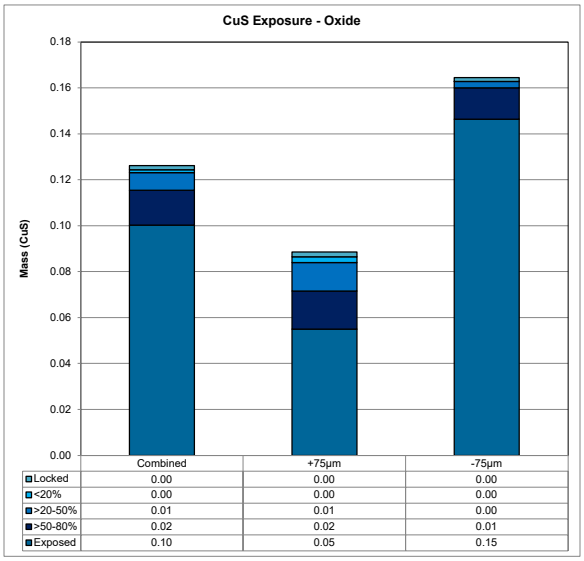


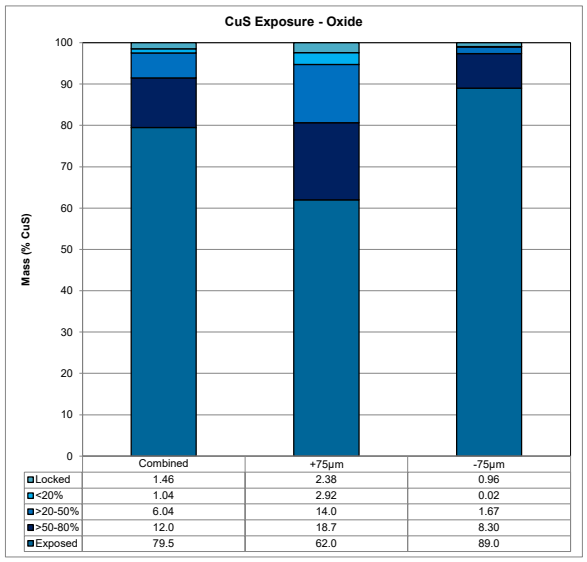
Absolute Mass of CuS Across Fraction (Sulphide)

Exposure	Combined	+75µm	-75µm
Exposed	2.31	1.33	3.07
>50-80%	0.13	0.21	0.06
>20-50%	0.05	0.08	0.04
<20%	0.01	0.01	0.02
Locked	0.02	0.02	0.03
Total	2.53	1.65	3.21

Normalized Mass of CuS Across Fraction (Sulphide)

Exposure	Combined	+75µm	-75µm
Exposed	91.2	80.5	95.6
>50-80%	5.03	12.6	1.99
>20-50%	2.16	4.61	1.18
<20%	0.58	0.78	0.50
Locked	0.98	1.46	0.79
Total	100.0	100.0	100.0





Absolute Mass of CuS Across Fraction (Oxide)

Exposure	Combined	+75µm	-75µm
Exposed	0.10	0.05	0.15
>50-80%	0.02	0.02	0.01
>20-50%	0.01	0.01	0.00
<20%	0.00	0.00	0.00
Locked	0.00	0.00	0.00
Total	0.13	0.09	0.16

Normalized Mass of CuS Across Fraction (Oxide)

Exposure	Combined	+75µm	-75µm
Exposed	79.5	62.0	89.0
>50-80%	12.0	18.7	8.30
>20-50%	6.04	14.0	1.67
<20%	1.04	2.92	0.02
Locked	1.46	2.38	0.96
Total	100.0	100.0	100.0

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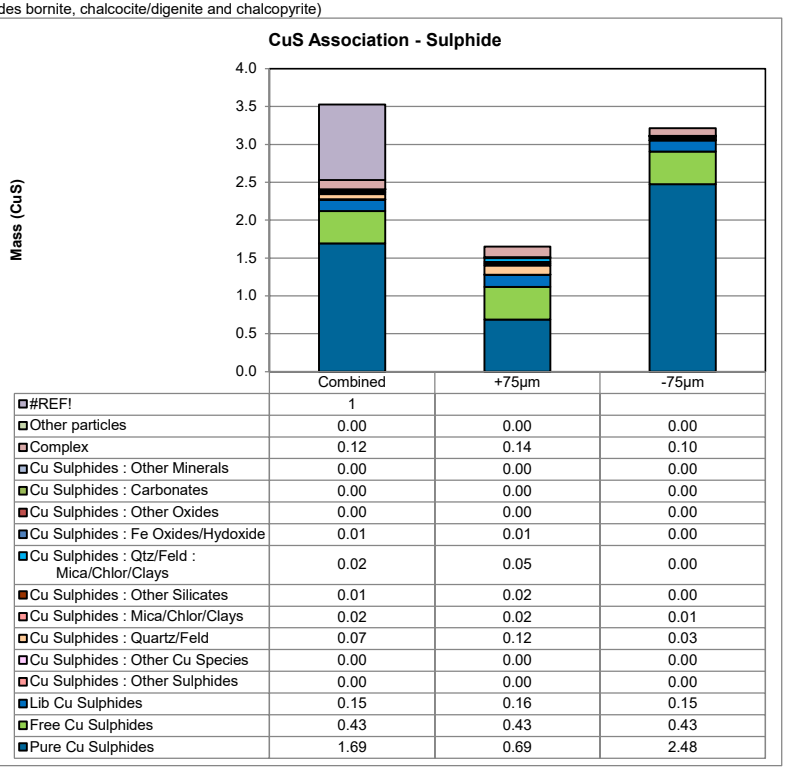
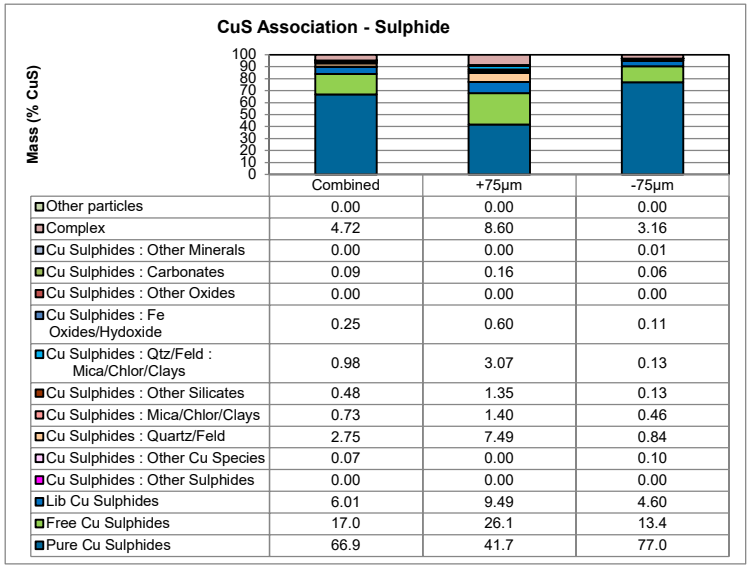
Copper Sulphides Association
(Includes bornite, chalcocite/digenite and chalcopyrite)



	Combined	+75µm	-75µm
#REF!	1		
Other particles	0.00	0.00	0.00
Complex	0.12	0.14	0.10
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Cu Sulphides : Carbonates	0.00	0.00	0.00
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Fe Oxides/Hydoxide	0.01	0.01	0.00
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.02	0.05	0.00
Cu Sulphides : Other Silicates	0.01	0.02	0.00
Cu Sulphides : Mica/Chlor/Clays	0.02	0.02	0.01
Cu Sulphides : Quartz/Feld	0.07	0.12	0.03
Cu Sulphides : Other Cu Species	0.00	0.00	0.00
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Lib Cu Sulphides	0.15	0.16	0.15
Free Cu Sulphides	0.43	0.43	0.43
Pure Cu Sulphides	1.69	0.69	2.48



	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	4.72	8.60	3.16
Cu Sulphides : Other Minerals	0.00	0.00	0.01
Cu Sulphides : Carbonates	0.09	0.16	0.06
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Fe Oxides/Hydoxide	0.25	0.60	0.11
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.98	3.07	0.13
Cu Sulphides : Other Silicates	0.48	1.35	0.13
Cu Sulphides : Mica/Chlor/Clays	0.73	1.40	0.46
Cu Sulphides : Quartz/Feld	2.75	7.49	0.84
Cu Sulphides : Other Cu Species	0.07	0.00	0.10
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Lib Cu Sulphides	6.01	9.49	4.60
Free Cu Sulphides	17.0	26.1	13.4
Pure Cu Sulphides	66.9	41.7	77.0

Absolute Mass of CuS Across Fraction (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Pure Cu Sulphides	1.69	0.69	2.48
Free Cu Sulphides	0.43	0.43	0.43
Lib Cu Sulphides	0.15	0.16	0.15
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Cu Sulphides : Other Cu Species	0.00	0.00	0.00
Cu Sulphides : Quartz/Feld	0.07	0.12	0.03
Cu Sulphides : Mica/Chlor/Clays	0.02	0.02	0.01
Cu Sulphides : Other Silicates	0.01	0.02	0.00
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.02	0.05	0.00
Cu Sulphides : Fe Oxides/Hydoxide	0.01	0.01	0.00
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Carbonates	0.00	0.00	0.00
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Complex	0.12	0.14	0.10
Other particles	0.00	0.00	0.00
Total	2.53	1.65	3.21

Normalized Mass of CuS Across Fraction (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Pure Cu Sulphides	66.9	41.7	77.0
Free Cu Sulphides	17.0	26.1	13.4
Lib Cu Sulphides	6.01	9.49	4.60
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Cu Sulphides : Other Cu Species	0.07	0.00	0.10
Cu Sulphides : Quartz/Feld	2.75	7.49	0.84
Cu Sulphides : Mica/Chlor/Clays	0.73	1.40	0.46
Cu Sulphides : Other Silicates	0.48	1.35	0.13
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.98	3.07	0.13
Cu Sulphides : Fe Oxides/Hydoxide	0.25	0.60	0.11
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Carbonates	0.09	0.16	0.06
Cu Sulphides : Other Minerals	0.00	0.00	0.01
Complex	4.72	8.60	3.16
Other particles	0.00	0.00	0.00
Total	100.0	100.0	100.0
Liberated	89.9	77.3	95.0

Carmacks Sulphide & Oxide Min
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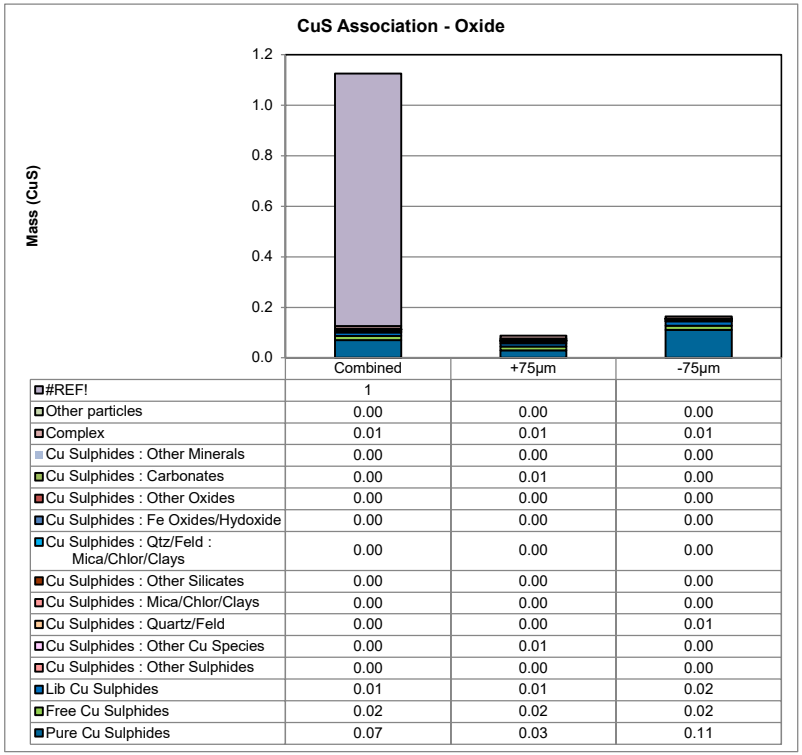
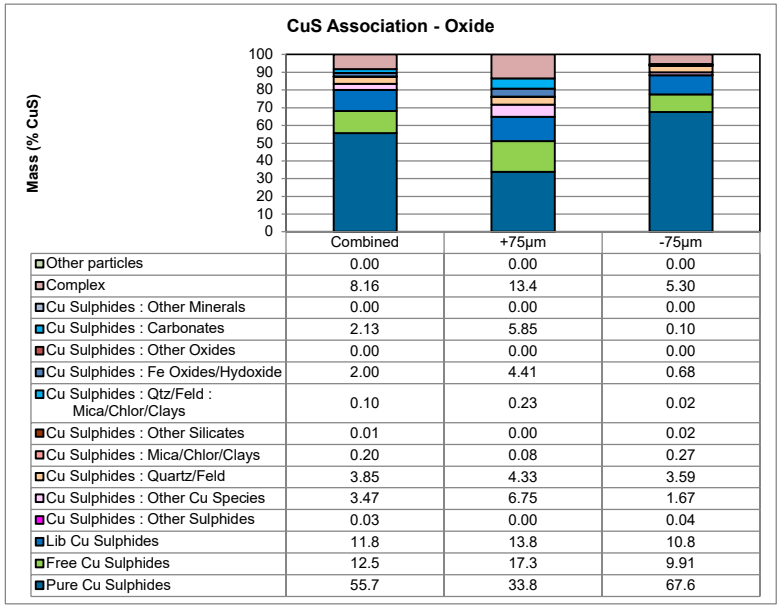
Copper Sulphides Association



	Combined	+75µm	-75µm
#REF!	1		
Other particles	0.00	0.00	0.00
Complex	0.01	0.01	0.01
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Cu Sulphides : Carbonates	0.00	0.01	0.00
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Fe Oxides/Hydoxide	0.00	0.00	0.00
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.00	0.00	0.00
Cu Sulphides : Other Silicates	0.00	0.00	0.00
Cu Sulphides : Mica/Chlor/Clays	0.00	0.00	0.00
Cu Sulphides : Quartz/Feld	0.00	0.00	0.01
Cu Sulphides : Other Cu Species	0.00	0.01	0.00
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Lib Cu Sulphides	0.01	0.01	0.02
Free Cu Sulphides	0.02	0.02	0.02
Pure Cu Sulphides	0.07	0.03	0.11



	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	8.16	13.4	5.30
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Cu Sulphides : Carbonates	2.13	5.85	0.10
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Fe Oxides/Hydoxide	2.00	4.41	0.68
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.10	0.23	0.02
Cu Sulphides : Other Silicates	0.01	0.00	0.02
Cu Sulphides : Mica/Chlor/Clays	0.20	0.08	0.27
Cu Sulphides : Quartz/Feld	3.85	4.33	3.59
Cu Sulphides : Other Cu Species	3.47	6.75	1.67
Cu Sulphides : Other Sulphides	0.03	0.00	0.04
Lib Cu Sulphides	11.8	13.8	10.8
Free Cu Sulphides	12.5	17.3	9.91
Pure Cu Sulphides	55.7	33.8	67.6

Absolute Mass of CuS Across Fraction (Oxide)

Mineral Name	Combined	+75µm	-75µm
Pure Cu Sulphides	0.07	0.03	0.11
Free Cu Sulphides	0.02	0.02	0.02
Lib Cu Sulphides	0.01	0.01	0.02
Cu Sulphides : Other Sulphides	0.00	0.00	0.00
Cu Sulphides : Other Cu Species	0.00	0.01	0.00
Cu Sulphides : Quartz/Feld	0.00	0.00	0.01
Cu Sulphides : Mica/Chlor/Clays	0.00	0.00	0.00
Cu Sulphides : Other Silicates	0.00	0.00	0.00
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.00	0.00	0.00
Cu Sulphides : Fe Oxides/Hydoxide	0.00	0.00	0.00
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Carbonates	0.00	0.01	0.00
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Complex	0.01	0.01	0.01
Other particles	0.00	0.00	0.00
Total	0.13	0.09	0.16

Normalized Mass of CuS Across Fraction (Oxide)

Mineral Name	Combined	+75µm	-75µm
Pure Cu Sulphides	55.7	33.8	67.6
Free Cu Sulphides	12.5	17.3	9.91
Lib Cu Sulphides	11.8	13.8	10.8
Cu Sulphides : Other Sulphides	0.03	0.00	0.04
Cu Sulphides : Other Cu Species	3.47	6.75	1.67
Cu Sulphides : Quartz/Feld	3.85	4.33	3.59
Cu Sulphides : Mica/Chlor/Clays	0.20	0.08	0.27
Cu Sulphides : Other Silicates	0.01	0.00	0.02
Cu Sulphides : Qtz/Feld : Mica/Chlor/Clays	0.10	0.23	0.02
Cu Sulphides : Fe Oxides/Hydoxide	2.00	4.41	0.68
Cu Sulphides : Other Oxides	0.00	0.00	0.00
Cu Sulphides : Carbonates	2.13	5.85	0.10
Cu Sulphides : Other Minerals	0.00	0.00	0.00
Complex	8.16	13.4	5.30
Other particles	0.00	0.00	0.00
Total	100.0	100.0	100.0
Liberated	80.0	65.0	88.3

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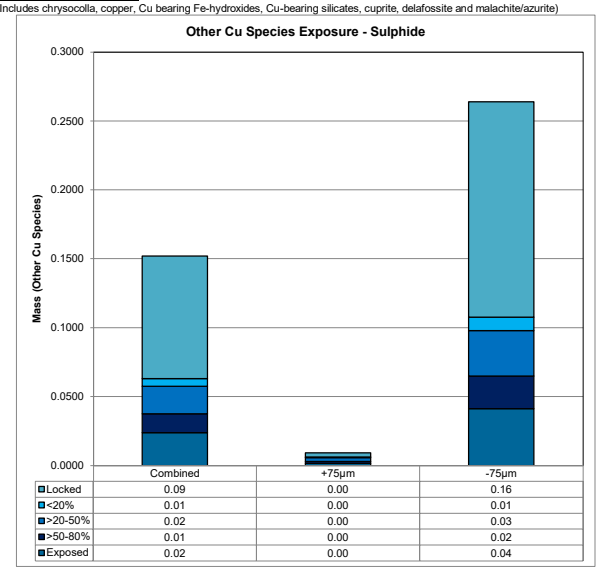
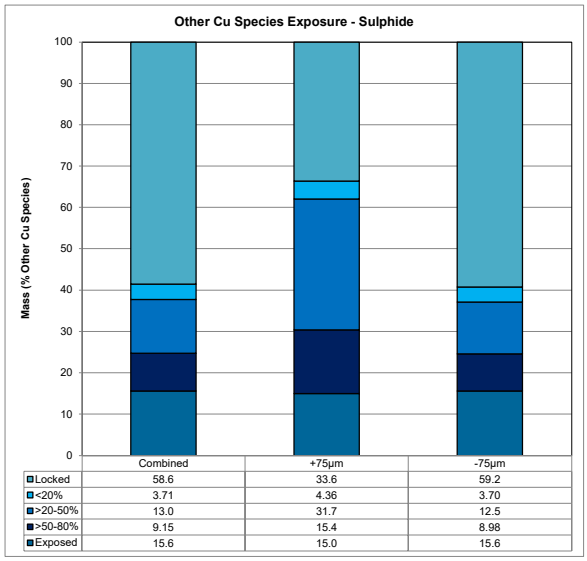
Other Cu Species Exposure
(Includes chrysocolla, copper, Cu bearing Fe-hydroxides, Cu-bearing silicates, cuprite, delafossite and malachite/azurite)



	Combined	+75µm	-75µm
Locked	0.09	0.00	0.16
<20%	0.01	0.00	0.01
>20-50%	0.02	0.00	0.03
>50-80%	0.01	0.00	0.02
Exposed	0.02	0.00	0.04



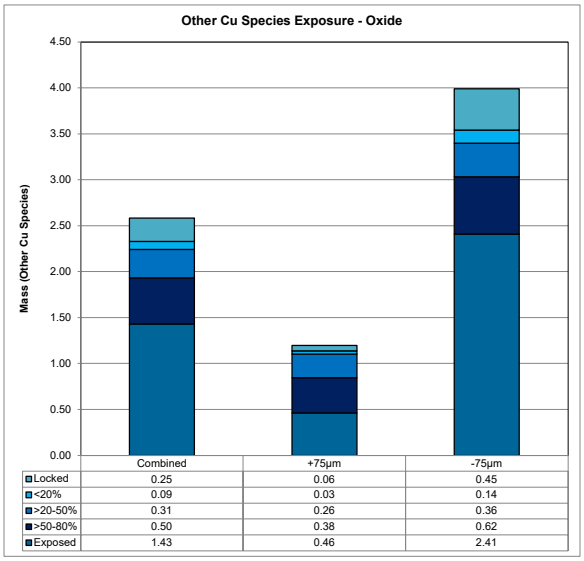
	Combined	+75µm	-75µm
Locked	58.6	33.6	59.2
<20%	3.71	4.36	3.70
>20-50%	13.0	31.7	12.5
>50-80%	9.15	15.4	8.98
Exposed	15.6	15.0	15.6

Absolute Mass of Other Cu Species Across Fraction (Sulphide)

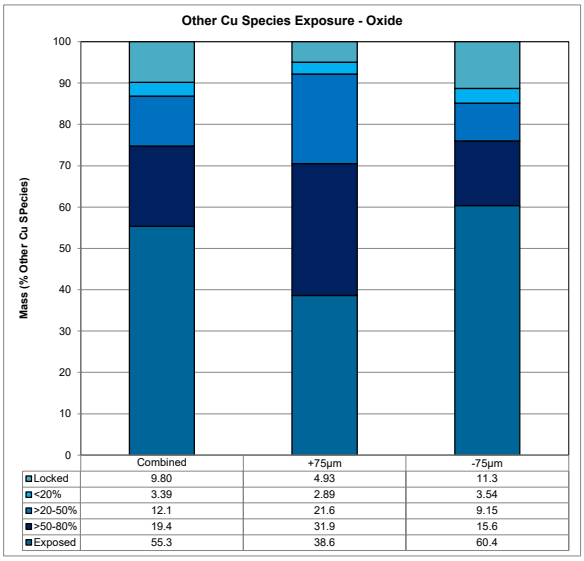
Exposure	Combined	+75µm	-75µm
Exposed	0.02	0.00	0.04
>50-80%	0.01	0.00	0.02
>20-50%	0.02	0.00	0.03
<20%	0.01	0.00	0.01
Locked	0.09	0.00	0.16
Total	0.15	0.01	0.26

Normalized Mass of Other Cu Species Across Fraction (Sulphide)

Exposure	Combined	+75µm	-75µm
Exposed	15.6	15.0	15.6
>50-80%	9.15	15.4	8.98
>20-50%	13.0	31.7	12.5
<20%	3.71	4.36	3.70
Locked	58.6	33.6	59.2
Total	100.0	100.0	100.0



	Combined	+75µm	-75µm
Locked	0.25	0.06	0.45
<20%	0.09	0.03	0.14
>20-50%	0.31	0.26	0.36
>50-80%	0.50	0.38	0.62
Exposed	1.43	0.46	2.41



	Combined	+75µm	-75µm
Locked	9.80	4.93	11.3
<20%	3.39	2.89	3.54
>20-50%	12.1	21.6	9.15
>50-80%	19.4	31.9	15.6
Exposed	55.3	38.6	60.4

Absolute Mass of Other Cu Species Across Fraction (Oxide)

Exposure	Combined	+75µm	-75µm
Exposed	1.43	0.46	2.41
>50-80%	0.50	0.38	0.62
>20-50%	0.31	0.26	0.36
<20%	0.09	0.03	0.14
Locked	0.25	0.06	0.45
Total	2.58	1.20	3.99

Normalized Mass of Other Cu Species Across Fraction (Oxide)

Exposure	Combined	+75µm	-75µm
Exposed	55.3	38.6	60.4
>50-80%	19.4	31.9	15.6
>20-50%	12.1	21.6	9.15
<20%	3.39	2.89	3.54
Locked	9.80	4.93	11.3
Total	100.0	100.0	100.0

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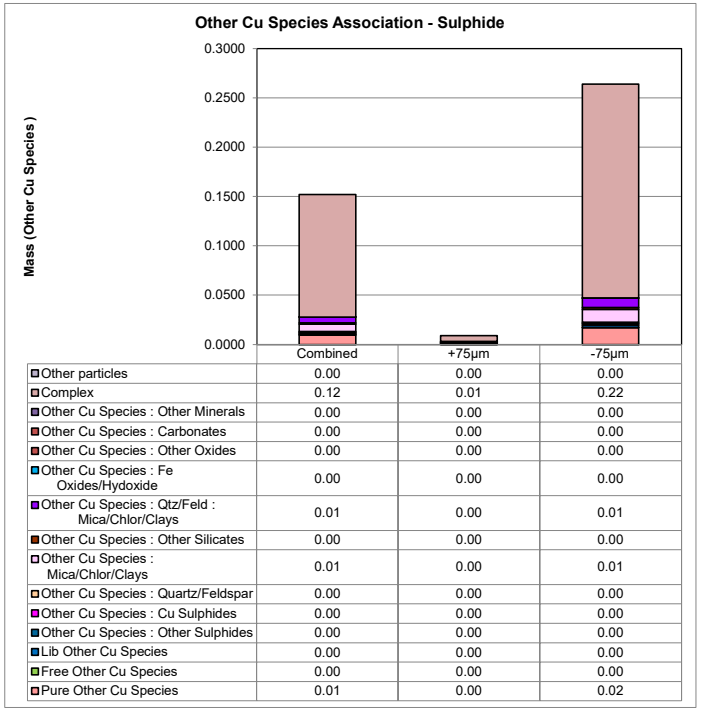
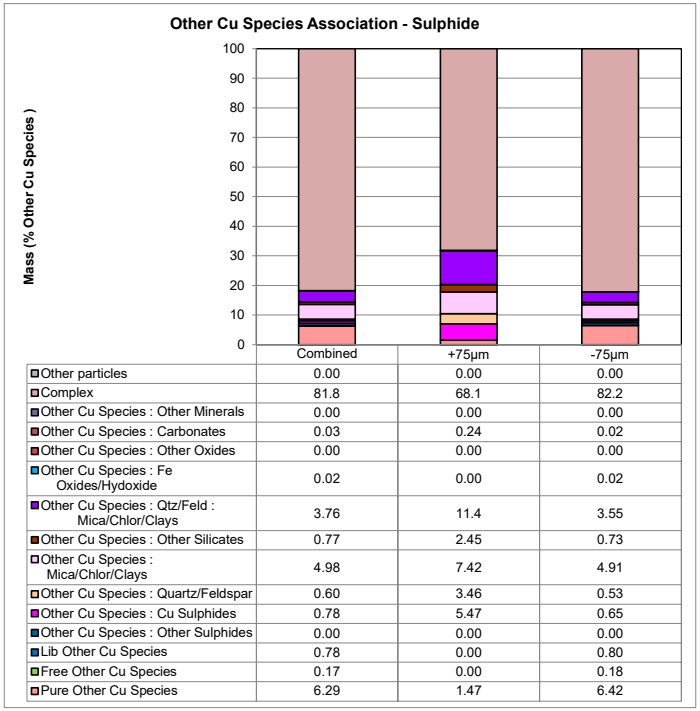
Other Cu Species Association
(Includes chrysocolla, copper, Cu bearing Fe-hydroxides, Cu-bearing silicates, cuprite, delafossite and malachite/azurite)



	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	0.12	0.01	0.22
Other Cu Species : Other Minerals	0.00	0.00	0.00
Other Cu Species : Carbonates	0.00	0.00	0.00
Other Cu Species : Other Oxides	0.00	0.00	0.00
Other Cu Species : Fe Oxides/Hydoxide	0.00	0.00	0.00
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	0.01	0.00	0.01
Other Cu Species : Other Silicates	0.00	0.00	0.00
Other Cu Species : Mica/Chlor/Clays	0.01	0.00	0.01
Other Cu Species : Quartz/Feldspar	0.00	0.00	0.00
Other Cu Species : Cu Sulphides	0.00	0.00	0.00
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Lib Other Cu Species	0.00	0.00	0.00
Free Other Cu Species	0.00	0.00	0.00
Pure Other Cu Species	0.01	0.00	0.02



	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	81.8	68.1	82.2
Other Cu Species : Other Minerals	0.00	0.00	0.00
Other Cu Species : Carbonates	0.03	0.24	0.02
Other Cu Species : Other Oxides	0.00	0.00	0.00
Other Cu Species : Fe Oxides/Hydoxide	0.02	0.00	0.02
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	3.76	11.4	3.55
Other Cu Species : Other Silicates	0.77	2.45	0.73
Other Cu Species : Mica/Chlor/Clays	4.98	7.42	4.91
Other Cu Species : Quartz/Feldspar	0.60	3.46	0.53
Other Cu Species : Cu Sulphides	0.78	5.47	0.65
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Lib Other Cu Species	0.78	0.00	0.80
Free Other Cu Species	0.17	0.00	0.18
Pure Other Cu Species	6.29	1.47	6.42

Absolute Mass of Other Cu Species Across Fraction (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Pure Other Cu Species	0.01	0.00	0.02
Free Other Cu Species	0.00	0.00	0.00
Lib Other Cu Species	0.00	0.00	0.00
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Other Cu Species : Cu Sulphides	0.00	0.00	0.00
Other Cu Species : Quartz/Feldspar	0.00	0.00	0.00
Other Cu Species : Mica/Chlor/Clays	0.01	0.00	0.01
Other Cu Species : Other Silicates	0.00	0.00	0.00
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	0.01	0.00	0.01
Other Cu Species : Fe Oxides/Hydoxide	0.00	0.00	0.00
Other Cu Species : Other Oxides	0.00	0.00	0.00
Other Cu Species : Carbonates	0.00	0.00	0.00
Other Cu Species : Other Minerals	0.00	0.00	0.00
Complex	0.12	0.01	0.22
Other particles	0.00	0.00	0.00
Total	0.15	0.01	0.26

Normalized Mass of Other Cu Species Across Fraction (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Pure Other Cu Species	6.29	1.47	6.42
Free Other Cu Species	0.17	0.00	0.18
Lib Other Cu Species	0.78	0.00	0.80
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Other Cu Species : Cu Sulphides	0.78	5.47	0.65
Other Cu Species : Quartz/Feldspar	0.60	3.46	0.53
Other Cu Species : Mica/Chlor/Clays	4.98	7.42	4.91
Other Cu Species : Other Silicates	0.77	2.45	0.73
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	3.76	11.4	3.55
Other Cu Species : Fe Oxides/Hydoxide	0.02	0.00	0.02
Other Cu Species : Other Oxides	0.00	0.00	0.00
Other Cu Species : Carbonates	0.03	0.24	0.02
Other Cu Species : Other Minerals	0.00	0.00	0.00
Complex	81.8	68.1	82.2
Other particles	0.00	0.00	0.00
Total	100.0	100.0	100.0
Liberated	7.24	1.47	7.40

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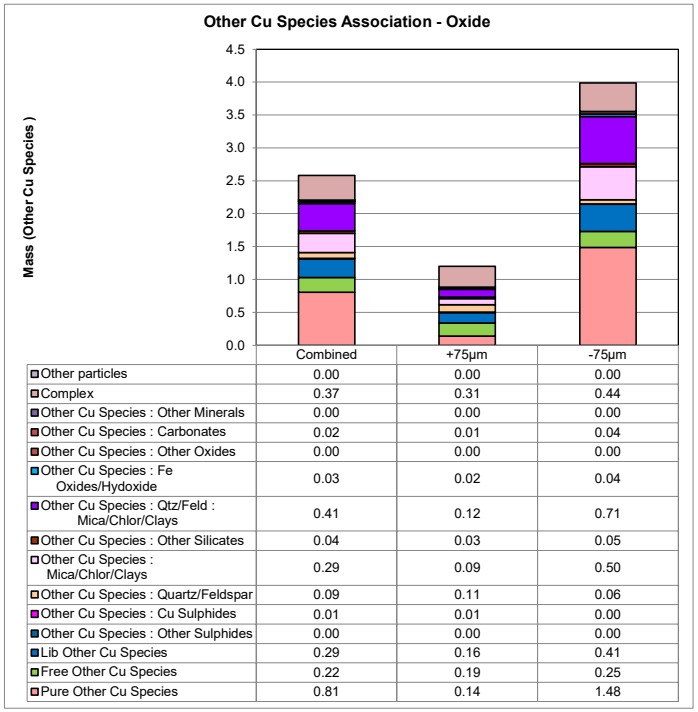
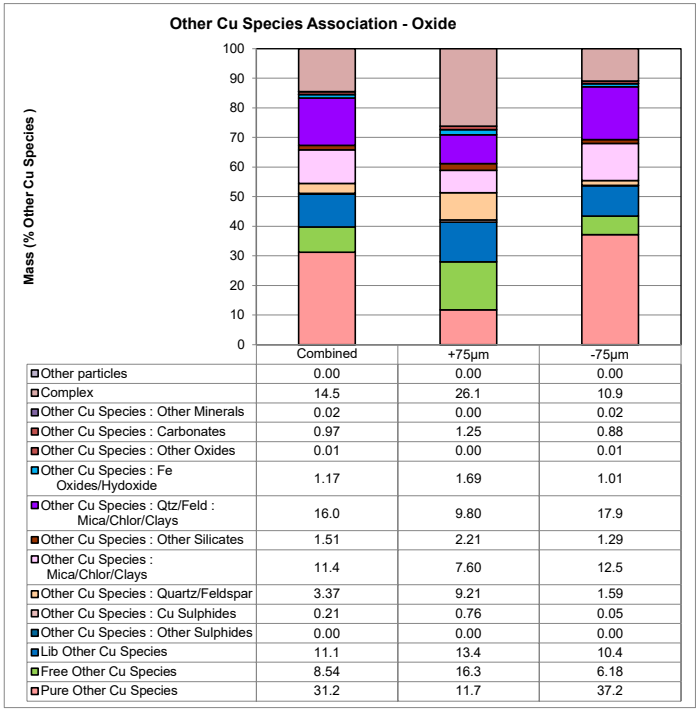
Other Cu Species Association



	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	0.37	0.31	0.44
Other Cu Species : Other Minerals	0.00	0.00	0.00
Other Cu Species : Carbonates	0.02	0.01	0.04
Other Cu Species : Other Oxides	0.00	0.00	0.00
Other Cu Species : Fe Oxides/Hydoxide	0.03	0.02	0.04
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	0.41	0.12	0.71
Other Cu Species : Other Silicates	0.04	0.03	0.05
Other Cu Species : Mica/Chlor/Clays	0.29	0.09	0.50
Other Cu Species : Quartz/Feldspar	0.09	0.11	0.06
Other Cu Species : Cu Sulphides	0.01	0.01	0.00
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Lib Other Cu Species	0.29	0.16	0.41
Free Other Cu Species	0.22	0.19	0.25
Pure Other Cu Species	0.81	0.14	1.48



	Combined	+75µm	-75µm
Other particles	0.00	0.00	0.00
Complex	14.5	26.1	10.9
Other Cu Species : Other Minerals	0.02	0.00	0.02
Other Cu Species : Carbonates	0.97	1.25	0.88
Other Cu Species : Other Oxides	0.01	0.00	0.01
Other Cu Species : Fe Oxides/Hydoxide	1.17	1.69	1.01
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	16.0	9.80	17.9
Other Cu Species : Other Silicates	1.51	2.21	1.29
Other Cu Species : Mica/Chlor/Clays	11.4	7.60	12.5
Other Cu Species : Quartz/Feldspar	3.37	9.21	1.59
Other Cu Species : Cu Sulphides	0.21	0.76	0.05
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Lib Other Cu Species	11.1	13.4	10.4
Free Other Cu Species	8.54	16.3	6.18
Pure Other Cu Species	31.2	11.7	37.2

Absolute Mass of Other Cu Species Across Fraction (Oxide)

Mineral Name	Combined	+75µm	-75µm
Pure Other Cu Species	0.81	0.14	1.48
Free Other Cu Species	0.22	0.19	0.25
Lib Other Cu Species	0.29	0.16	0.41
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Other Cu Species : Cu Sulphides	0.01	0.01	0.00
Other Cu Species : Quartz/Feldspar	0.09	0.11	0.06
Other Cu Species : Mica/Chlor/Clays	0.29	0.09	0.50
Other Cu Species : Other Silicates	0.04	0.03	0.05
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	0.41	0.12	0.71
Other Cu Species : Fe Oxides/Hydoxide	0.03	0.02	0.04
Other Cu Species : Other Oxides	0.00	0.00	0.00
Other Cu Species : Carbonates	0.02	0.01	0.04
Other Cu Species : Other Minerals	0.00	0.00	0.00
Complex	0.37	0.31	0.44
Other particles	0.00	0.00	0.00
Total	2.58	1.20	3.99

Normalized Mass of Other Cu Species Across Fraction (Oxide)

Mineral Name	Combined	+75µm	-75µm
Pure Other Cu Species	31.2	11.7	37.2
Free Other Cu Species	8.54	16.3	6.18
Lib Other Cu Species	11.1	13.4	10.4
Other Cu Species : Other Sulphides	0.00	0.00	0.00
Other Cu Species : Cu Sulphides	0.21	0.76	0.05
Other Cu Species : Quartz/Feldspar	3.37	9.21	1.59
Other Cu Species : Mica/Chlor/Clays	11.4	7.60	12.5
Other Cu Species : Other Silicates	1.51	2.21	1.29
Other Cu Species : Qtz/Feld : Mica/Chlor/Clays	16.0	9.80	17.9
Other Cu Species : Fe Oxides/Hydoxide	1.17	1.69	1.01
Other Cu Species : Other Oxides	0.01	0.00	0.01
Other Cu Species : Carbonates	0.97	1.25	0.88
Other Cu Species : Other Minerals	0.02	0.00	0.02
Complex	14.5	26.1	10.9
Other particles	0.00	0.00	0.00
Total	100.0	100.0	100.0
Liberated	50.9	41.4	53.7

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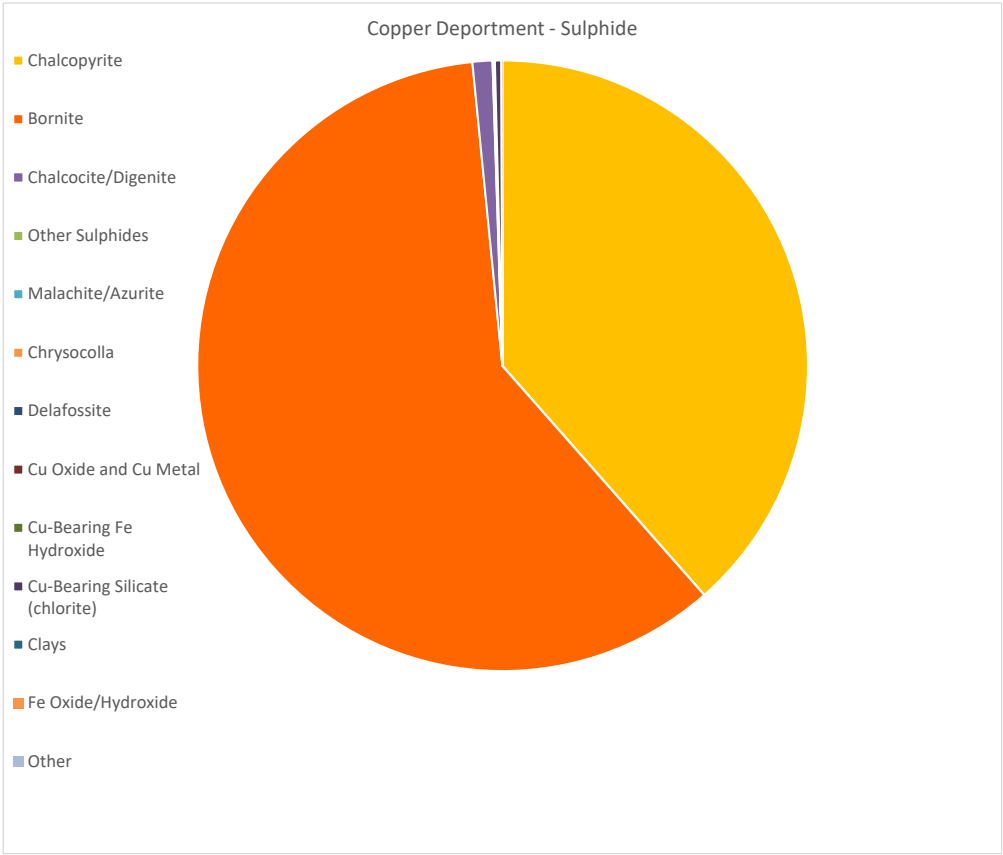
Copper Deportment (Sulphide)



Mass % of Copper in Phase (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Chalcopyrite	0.47	0.32	0.58
Bornite	0.72	0.45	0.94
Chalcocite/Digenite	0.01	0.01	0.01
Other Sulphides	0.00	0.00	0.00
Malachite/Azurite	0.00	0.00	0.00
Chrysocolla	0.00	0.00	0.00
Delafossite	0.00	0.00	0.00
Cu Oxide and Cu Metal	0.00	0.00	0.00
Cu-Bearing Fe Hydroxide	0.00	0.00	0.00
Cu-Bearing Silicate (chlorite)	0.00	0.00	0.01
Clays	0.00	0.00	0.00
Fe Oxide/Hydroxide	0.00	0.00	0.00
Other	0.00	0.00	0.00
Total	1.21	0.78	1.54

Normalized Mass % of Copper in Phase (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Chalcopyrite	38.5	41.1	37.5
Bornite	59.9	57.2	61.0
Chalcocite/Digenite	1.06	1.42	0.92
Other Sulphides	0.08	0.12	0.06
Malachite/Azurite	0.00	0.00	0.00
Chrysocolla	0.00	0.00	0.00
Delafossite	0.00	0.00	0.00
Cu Oxide and Cu Metal	0.00	0.00	0.00
Cu-Bearing Fe Hydroxide	0.03	0.05	0.03
Cu-Bearing Silicate (chlorite)	0.36	0.02	0.49
Clays	0.02	0.04	0.02
Fe Oxide/Hydroxide	0.03	0.08	0.01
Other	0.00	0.00	0.00
Total	100.0	100.0	100.0

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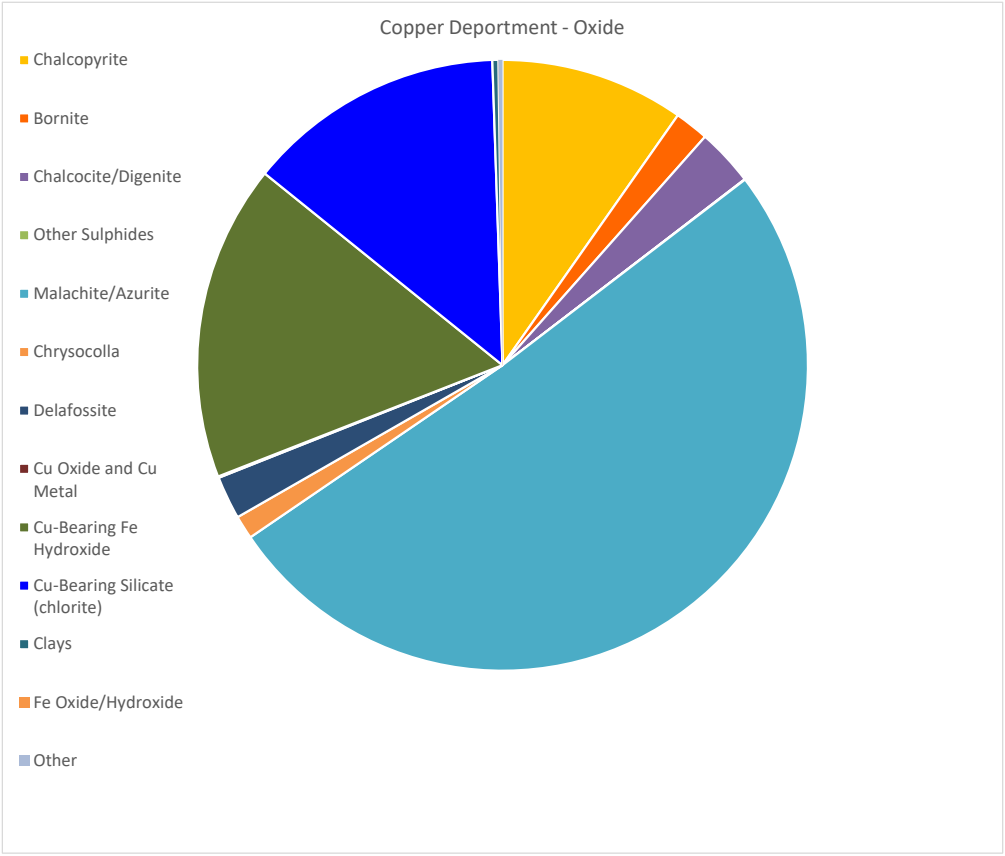
Copper Deportment (Oxide)



Mass % of Copper in Phase (Oxide)

Mineral Name	Combined	+75µm	-75µm
Chalcopyrite	0.03	0.02	0.05
Bornite	0.01	0.01	0.01
Chalcocite/Digenite	0.01	0.01	0.01
Other Sulphides	0.00	0.00	0.00
Malachite/Azurite	0.18	0.16	0.20
Chrysocolla	0.00	0.00	0.01
Delafossite	0.01	0.01	0.01
Cu Oxide and Cu Metal	0.00	0.00	0.00
Cu-Bearing Fe Hydroxide	0.06	0.03	0.09
Cu-Bearing Silicate (chlorite)	0.05	0.02	0.08
Clays	0.00	0.00	0.00
Fe Oxide/Hydroxide	0.00	0.00	0.00
Other	0.00	0.00	0.00
Total	0.35	0.25	0.45

Normalized Mass % of Copper in Phase (Oxide)

Mineral Name	Combined	+75µm	-75µm
Chalcopyrite	9.73	9.11	10.1
Bornite	1.82	2.00	1.71
Chalcocite/Digenite	3.02	3.78	2.59
Other Sulphides	0.04	0.03	0.04
Malachite/Azurite	50.9	62.3	44.4
Chrysocolla	1.25	0.60	1.62
Delafossite	2.28	2.48	2.17
Cu Oxide and Cu Metal	0.07	0.11	0.04
Cu-Bearing Fe Hydroxide	16.7	12.2	19.3
Cu-Bearing Silicate (chlorite)	13.7	6.87	17.5
Clays	0.30	0.34	0.28
Fe Oxide/Hydroxide	0.00	0.00	0.01
Other	0.22	0.15	0.27
Total	100.0	100.0	100.0

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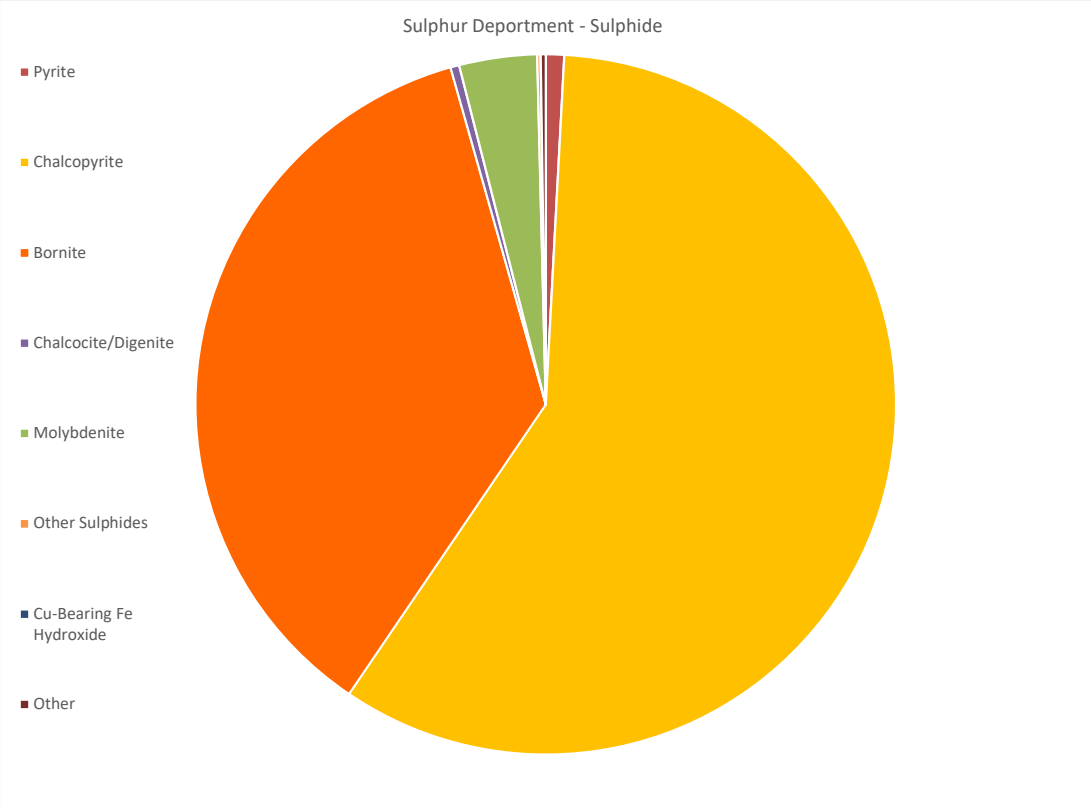
Sulphur Deportment (Sulphide)



Mass % of Sulphur in Phase (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Pyrite	0.01	0.00	0.01
Chalcopyrite	0.48	0.33	0.60
Bornite	0.30	0.18	0.38
Chalcocite/Digenite	0.00	0.00	0.00
Molybdenite	0.03	0.02	0.04
Other Sulphides	0.00	0.00	0.00
Cu-Bearing Fe Hydroxide	0.00	0.00	0.00
Other	0.00	0.00	0.00
Total	0.82	0.53	1.04

Normalized Mass % of Sulphur in Phase (Sulphide)

Mineral Name	Combined	+75µm	-75µm
Pyrite	0.85	0.80	0.87
Chalcopyrite	58.7	61.0	57.7
Bornite	36.1	34.2	36.9
Chalcocite/Digenite	0.40	0.52	0.34
Molybdenite	3.59	3.26	3.72
Other Sulphides	0.17	0.17	0.17
Cu-Bearing Fe Hydroxide	0.00	0.00	0.00
Other	0.23	0.04	0.30
Total	100.0	100.0	100.0

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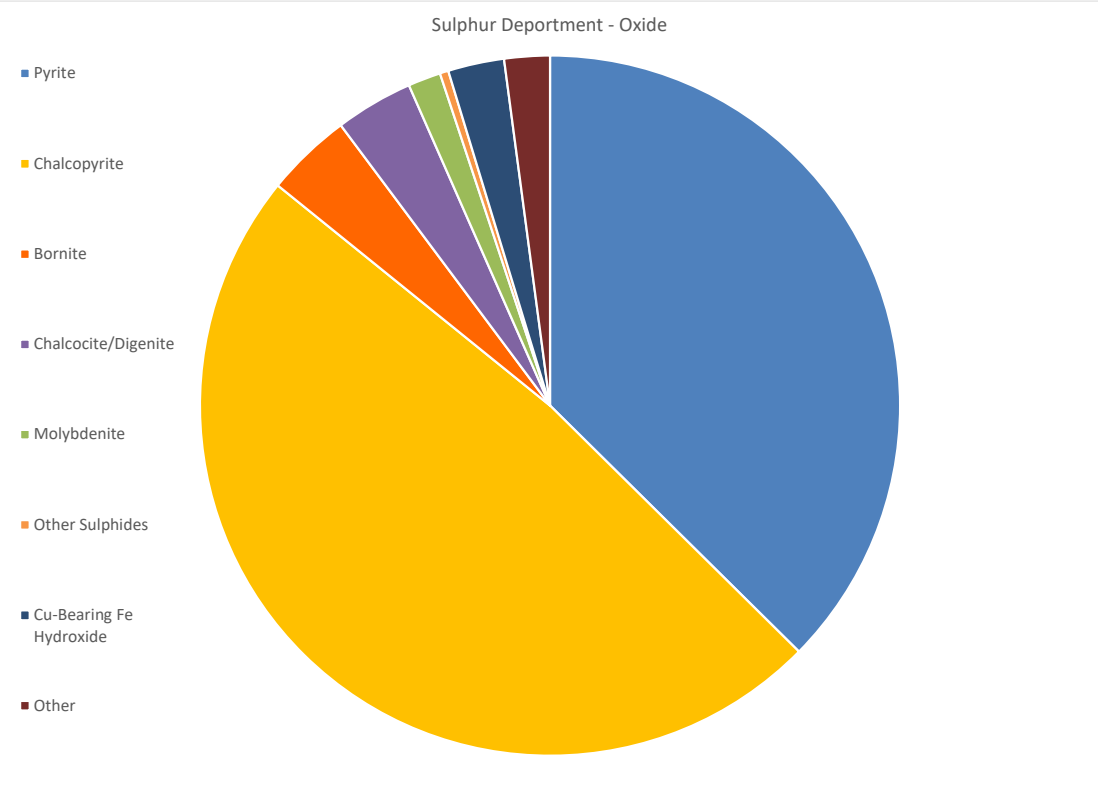
Copper Deportment (Oxide)



Mass % of Sulphur in Phase (Oxide)

Mineral Name	Combined	+75µm	-75µm
Pyrite	0.03	0.03	0.03
Chalcopyrite	0.04	0.02	0.05
Bornite	0.00	0.00	0.00
Chalcocite/Digenite	0.00	0.00	0.00
Molybdenite	0.00	0.00	0.00
Other Sulphides	0.00	0.00	0.00
Cu-Bearing Fe Hydroxide	0.00	0.00	0.00
Other	0.00	0.00	0.00
Total	0.07	0.06	0.09

Normalized Mass % of Sulphur in Phase (Oxide)

Mineral Name	Combined	+75µm	-75µm
Pyrite	37.4	46.2	31.8
Chalcopyrite	48.4	41.6	52.7
Bornite	3.97	4.26	3.78
Chalcocite/Digenite	3.60	4.22	3.21
Molybdenite	1.51	0.16	2.36
Other Sulphides	0.40	0.16	0.55
Cu-Bearing Fe Hydroxide	2.60	1.77	3.12
Other	2.09	1.55	2.43
Total	100.0	100.0	100.0

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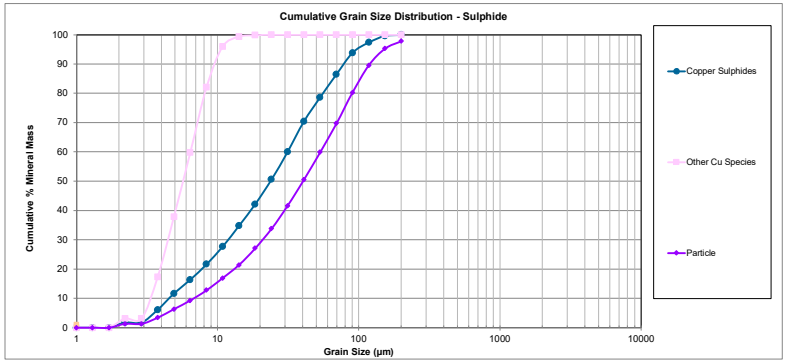
Grain size distribution

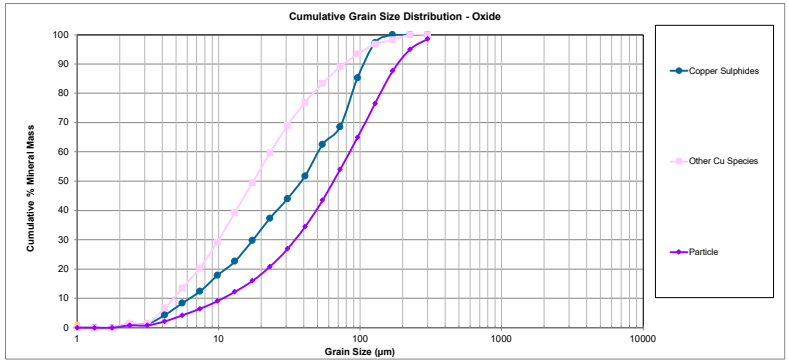


Grain size distribution - Sulphide

Mineral/ Sample ID	Cumulative Grain Size P80	Cumulative Grain Size Median
Copper Sulphides	78	30
Other Cu Species	9	6
Particle	126	53

Grain size	Top size [µm] /	Copper Sulphides	Other Cu Species	Particle
Unit	µm	Mass %	Mass %	Mass %
<1.00	1.0	0.0	0.0	0.0
<1.33	1.3	0.0	0.0	0.0
<1.77	1.7	0.0	0.0	0.0
<2.35	2.2	1.8	3.2	1.3
<3.13	2.9	1.8	3.2	1.3
<4.16	3.8	6.1	17	3.4
<5.54	4.9	12	38	6.3
<7.36	6.4	16	60	9.3
<9.79	8.3	22	82	13
<13.02	11	28	96	17
<17.32	14	35	99	21
<23.04	18	42	100	27
<30.64	24	51	100	34
<40.75	31	60	100	42
<54.20	41	70	100	51
<72.08	53	79	100	60
<95.87	69	87	100	70
<127.51	90	94	100	80
<169.59	118	97	100	90
<225.56	153	100	100	95
<300.00	200	100	100	98
All grains		**100**	**100**	**100**

Grain size distribution



Grain size distribution - Oxide

Mineral/ Sample ID	Cumulative Grain Size P80	Cumulative Grain Size Median
Copper Sulphides	91	38
Other Cu Species	46	18
Particle	139	65

Grain Size	Top size [µm] /	Copper Sulphides	Other Cu Species	Particle
Unit	µm	Mass %	Mass %	Mass %
<1.00	1.0	0.0	0.0	0.0
<1.33	1.3	0.0	0.0	0.0
<1.77	1.8	0.0	0.0	0.0
<2.35	2.4	1.3	1.5	0.8
<3.13	3.1	1.3	1.5	0.8
<4.16	4.2	4.3	6.8	2.2
<5.54	5.5	8.4	14	4.3
<7.36	7.4	12	20	6.5
<9.79	9.8	18	29	9.1
<13.02	13	23	39	12
<17.32	17	30	49	16
<23.04	23	37	60	21
<30.64	31	44	69	27
<40.75	41	52	77	34
<54.20	54	63	83	44
<72.08	72	69	89	54
<95.87	96	85	93	65
<127.51	128	97	97	77
<169.59	170	100	98	88
<225.56	226	100	100	95
<300.00	300	100	100	99
All grains		**100**	**100**	**100**

Appendix B – Flotation Test Results

Test No.: **Sulphide-F1** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 06/06/2022

Purpose: Initial Rougher kinetics test on sulphide ore
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh sulphide ore
Grind: 13'40" / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 130 µm **(Comb)**
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Lime				PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										13'40"			8.9	240
Cond.	200										3		10.1	151
Cu Ro 1					15	15		10			1	1	10.0	62
Cu Ro 2											1	2		
Cu Ro 3											1	3	9.4	69
Cu Ro 4	120				5	5		5			1	4	10.2	29
Cu Ro 5	65				10	10					1	5	10.1	32
Total					30	30		15						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: good froth

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**			**Cu**	**S**	**Au**	**Ag**		
Cu Ro Conc 1	53.2	2.68	26.8	18.5	5.33	80.9			73.2	73.0	55.8	64.5		
Cu Ro Conc 2	23.0	1.16	15.6	10.8	3.75	51			18.4	18.4	17.0	17.6		
Cu Ro Conc 3	14.1	0.71	5.17	3.75	1.53	6.0			3.7	3.9	4.2	1.3		
Cu Ro Conc 4	36.2	1.82	0.69	0.50	0.46	3.7			1.3	1.3	3.3	2.0		
Cu Ro Conc 5	35.9	1.81	0.32	0.22	0.25	1.9			0.6	0.6	1.8	1.0		
Cu Ro Tail	1826.3	91.8	0.03	0.02	0.05	< 0.5			2.8	2.7	18.0	13.7		
Head (calc.)	1988.7	100	0.98	0.68	0.26	3.4			100	100	100	100		
(direct)			0.92	0.67	0.24	3.0								

Combined Products														
Ro Conc 1	53.2	2.68	26.8	18.5	5.33	80.9			73.2	73.0	55.8	64.5		
Ro Conc 1-2	76.2	3.83	23.4	16.2	4.85	71.9			91.6	91.4	72.8	82.0		
Ro Conc 1-3	90.3	4.54	20.5	14.2	4.33	61.6			95.3	95.4	77.0	83.3		
Ro Conc 1-4	126.5	6.36	14.9	10.3	3.23	45.0			96.6	96.7	80.3	85.3		
Ro Conc 1-5	162.4	8.17	11.6	8.08	2.57	35.5			97.2	97.3	82.0	86.3		

Test No.: **Sulphide-F2** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 06/15/2022

Purpose: Rougher kinetics test on sulphide ore at coarser grind and natural pH
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh sulphide ore
Grind: 6.5 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 202 µm **(Comb)**
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
					PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										6.5			9.0	94
Cu Ro 1					15	15		10			1	1	9.1	57
Cu Ro 2											1	2		
Cu Ro 3								5			1	3	8.7	78
Cu Ro 4					5	5		5			1	4	8.8	61
Cu Ro 5					5	5		5			1	5	8.7	49
Total					25	25		25						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: good froth

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**			**Cu**	**S**	**Au**	**Ag**		
Cu Ro Conc 1	68.3	3.46	21.3	14.7	3.97	57.8			75.1	74.8	54.1	64.1		
Cu Ro Conc 2	33.5	1.70	9.42	6.5	2.31	27.3			16.3	16.2	15.4	14.9		
Cu Ro Conc 3	25.2	1.28	2.26	1.53	1.30	8.00			2.9	2.9	6.5	3.3		
Cu Ro Conc 4	25.6	1.30	0.92	0.64	0.58	4.30			1.2	1.2	3.0	1.8		
Cu Ro Conc 5	30.9	1.57	0.57	0.40	0.50	2.80			0.9	0.9	3.1	1.4		
Cu Ro Tail	1787.9	90.7	0.039	0.03	0.05	< 0.5			3.6	4.0	17.8	14.5		
Head (calc.)	1971.4	100	0.98	0.68	0.25	3.1			100	100	100	100		
(direct)			0.92	0.67	0.24	3.0								

Combined Products														
Ro Conc 1	68.3	3.46	21.3	14.7	3.97	57.8			75.1	74.8	54.1	64.1		
Ro Conc 1-2	101.8	5.16	17.4	12.0	3.42	47.8			91.3	91.0	69.6	79.0		
Ro Conc 1-3	127.0	6.44	14.4	9.92	3.00	39.9			94.3	93.9	76.1	82.3		
Ro Conc 1-4	152.6	7.74	12.1	8.36	2.60	33.9			95.5	95.1	79.1	84.1		
Ro Conc 1-5	183.5	9.31	10.2	7.02	2.24	28.7			96.4	96.0	82.2	85.5		

Test No.: **Sulphide-F3** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 06/15/2022

Purpose: Rougher kinetics test on sulphide ore at finer grind and natural pH
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh sulphide ore
Grind: 18.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 90 µm **(Comb)**
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
					PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										18			9.0	207
Cu Ro 1					15	15		20			1	1	9.0	116
Cu Ro 2											1	2		
Cu Ro 3											1	3	8.8	140
Cu Ro 4					5	5		5			1	4	8.8	113
Cu Ro 5					5	5					1	5	8.7	115
Total					25	25		25						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: good froth

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**			**Cu**	**S**	**Au**	**Ag**		
Cu Ro Conc 1	64.2	3.26	25.8	15.1	5.38	75.1			87.0	85.1	59.0	73.8		
Cu Ro Conc 2	28.2	1.43	6.64	4.44	2.05	21.9			9.8	11.0	9.9	9.4		
Cu Ro Conc 3	28.3	1.44	0.84	0.58	0.53	4.00			1.2	1.4	2.6	1.7		
Cu Ro Conc 4	35.3	1.79	0.30	0.20	0.50	1.80			0.6	0.6	3.0	1.0		
Cu Ro Conc 5	38.2	1.94	0.14	0.10	0.21	0.90			0.3	0.3	1.4	0.5		
Cu Ro Tail	1773.8	90.1	0.012	0.01	0.08	< 0.5			1.1	1.6	24.2	13.6		
Head (calc.)	1968.0	100	0.97	0.58	0.30	3.3			100	100	100	100		
(direct)			0.92	0.67	0.24	3.0								

Combined Products														
Ro Conc 1	64.2	3.26	25.8	15.1	5.38	75.1			87.0	85.1	59.0	73.8		
Ro Conc 1-2	92.4	4.70	20.0	11.8	4.36	58.9			96.8	96.0	68.8	83.2		
Ro Conc 1-3	120.7	6.13	15.5	9.20	3.46	46.0			98.0	97.5	71.4	84.9		
Ro Conc 1-4	156.0	7.93	12.0	7.17	2.79	36.0			98.6	98.1	74.4	85.9		
Ro Conc 1-5	194.2	9.87	9.70	5.78	2.29	29.1			98.9	98.4	75.8	86.4		

Test No.: **Sulphide-F4** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/06/2022

Purpose: Cleaner test
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh sulphide ore
Grind: 13'40" / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 130 µm
Regrind: As outlined below. K_{80} = 33 µm
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Lime				PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										13'40"			8.9	225
Cu Ro 1					15	15		20			1	1	8.9	90
Cu Ro 2											1	2		
Cu Ro 3											1	2	8.7	224
Cu Ro 4					5	5		5			1	2	8.7	165
Cu Ro 5					5	5					1	2	8.7	160
Regrind										10			8.8	240
Cu Cln 1	155				8+2	8+2					1	3+2	10.6	24
Cu Cln 2	95				5	5					1	5	11.2	-48
Total					40	40		25						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: good froth

Metallurgical Balance

Product	Weight		Assays, %, g/t						% Distribution					
	g	%	Cu	S	Au	Ag	$Cu\text{-}H_2SO_4$		Cu	S	Au	Ag		
Cu Cln2 Conc	43.2	2.21	42.7	30.5	7.67	117	1.12		93.7	93.4	69.0	78.4		
Cu Cln2 tail	16.9	0.87	2.32	1.43	0.75	11			2.0	1.7	2.6	2.9		
Cu Cln1 Tail	102.7	5.26	0.48	0.32	0.28	3			2.5	2.3	6.0	4.8		
Cu Ro Tail	1790.6	91.67	0.02	0.02	0.06	<0.5	0.006		1.8	2.5	22.4	13.9		
Head (calc.)	1953.4	100	1.01	0.72	0.25	3.3			100	100	100	100		
(direct)			0.92	0.67	0.24	3.0	0.099							

Combined Products														
Cu Cln2 Conc	43.2	2.21	42.7	30.5	7.67	117.0			93.7	93.4	69.0	78.4		
Cu Cln1 Conc	60.1	3.08	31.3	22.3	5.72	87.2			95.7	95.1	69.0	78.4		
Cu Ro Conc	162.8	8.33	11.9	8.44	2.29	34.1			98.2	97.5	77.6	86.1		

Test No.: **Sulphide-F5** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/06/2022

Purpose: Cleaner test at coarse grind
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh sulphide ore
Grind: 6.5 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 202 µm
Regrind: As outlined below. K_{80} = 30.1 µm
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Lime				PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										6.5			9.0	172
Cu Ro 1					15	15		20			1	1	9.0	68
Cu Ro 2											1	2		
Cu Ro 3											1	2	8.8	231
Cu Ro 4					5	5		5			1	2	8.8	173
Cu Ro 5					5	5					1	2	8.8	168
Regrind										15			8.8	191
Cu Cln 1	145				8+2	8+2					1	3+2	10.7	8
Cu Cln 2	50				5	5					1	5	11.1	-50
Total					40	40		25						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: good froth

Metallurgical Balance

Product	Weight		Assays, %, g/t						% Distribution					
	g	%	Cu	S	Au	Ag	Cu-H_2SO_4		Cu	S	Au	Ag		
Cu Cln2 Conc	42.0	2.14	41.4	27.1	7.78	123	1.55		90.4	92.4	66.5	78.3		
Cu Cln2 tail	16.3	0.83	3.32	2.17	0.78	14			2.8	2.9	2.6	3.5		
Cu Cln1 Tail	99.0	5.05	0.55	0.41	0.26	3			2.8	3.3	5.2	4.5		
Cu Ro Tail	1803.9	91.98	0.042	< 0.01	0.07	<0.5	0.007		3.9	1.5	25.7	13.7		
Head (calc.)	1961.2	100	0.98	0.63	0.25	3.4			100	100	100	100		
(direct)			0.92	0.67	0.24	3.0	0.099							

Combined Products														
Cu Cln2 Conc	42.0	2.14	41.4	27.1	7.78	123.0			90.4	92.4	66.5	78.3		
Cu Cln1 Conc	58.3	2.97	29.8	19.5	5.60	88.6			93.2	95.2	69.1	81.8		
Cu Ro Conc	157.3	8.02	11.7	7.72	2.32	36.2			96.1	98.5	74.3	86.3		

Test No.: **Oxide-F1** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 06/15/2022

Purpose: Rougher kinetics test on oxide ore at natural pH with sulphidization
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh Oxide ore
Grind: 12.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 151 µm
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Na2S				PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										12			8.7	228
Cond.	500										5		10.1	-176
Cu Ro 1					15	15		10			1	1	10.0	-95
Cu Ro 2					10			5			1	2	9.9	-50
Cu Ro 3					10			20			1	3	9.7	-21
Cond.	300										5		10.1	-208
Cu Ro 4					10	10		10			1	4	10.1	-172
Cu Ro 5					10			5			1	5	9.8	-57
Total					55	25		50						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: froth ok

Metallurgical Balance

Product	Weight		Assays, %, g/t						% Distribution					
	g	%	Cu	S	Au	Ag			Cu	S	Au	Ag		
Cu Ro Conc 1	32.0	1.64	13.4	2.38	5.22	44.4			36.4	63.7	41.9	33.8		
Cu Ro Conc 2	25.2	1.29	4.23	0.56	1.29	19.5			9.1	11.8	8.2	11.7		
Cu Ro Conc 3	24.5	1.25	1.28	0.15	0.43	8.7			2.7	3.1	2.6	5.1		
Cu Ro Conc 4	39.0	1.99	1.57	0.12	0.39	4.0			5.2	3.9	3.8	3.7		
Cu Ro Conc 5	28.9	1.48	0.86	0.10	0.36	4.2			2.1	2.4	2.6	2.9		
Cu Ro Tail	1806.5	92.4	0.29	<0.01	0.09	1.0			44.5	15.1	40.8	42.9		
Head (calc.)	1956.1	100	0.60	0.06	0.20	2.2			100	100	100	100		
(direct)			0.60	0.06	0.25	2.4								
				Re-assay:	0.08									
Combined Products														
Ro Conc 1	32.0	1.64	13.4	2.38	5.22	44.4			36.4	63.7	41.9	33.8		
Ro Conc 1-2	57.2	2.92	9.36	1.58	3.49	33.4			45.5	75.5	50.1	45.4		
Ro Conc 1-3	81.7	4.18	6.94	1.15	2.57	26.0			48.2	78.6	52.7	50.5		
Ro Conc 1-4	120.7	6.17	5.20	0.82	1.87	18.9			53.4	82.5	56.6	54.2		
Ro Conc 1-5	149.6	7.65	4.36	0.68	1.58	16.1			55.5	84.9	59.2	57.1		

Test No.: **Oxide-F2** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 06/28/2022

Purpose: Rougher kinetics test on oxide ore at natural pH with sulphidization and A-OX100 flotation
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh oxide ore
Grind: 15.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 132 µm **(Comb)**
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne								Time, minutes			pH	Ep
	Na2S		A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										15			8.5	268
Cond.	**650**										**5**		**10.1**	**-153**
Cu Ro 1					35	15		10			1	**2**	10.0	-104
Cu Ro 2								10				**3**	9.6	80
Cond.	**350**										**5**		**10.2**	**-238**
Cu Ro 3					10	10		10			1	**3**	10.1	-193
Cu Ro 4					10			5			1	4	9.9	-64
Cu Ro 5			**150**			**5**					**3**	**3**	**9.7**	**-47**
Total					55	30		35						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: thick froth in Ro 5

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**			**Cu**	**S**	**Au**	**Ag**		
Cu Ro Conc 1	53.5	2.72	10.0	1.58	5.13	36.3			46.5	66.1	60.9	44.8		
Cu Ro Conc 2	20.2	1.03	1.85	0.21	0.63	13			3.2	3.3	2.8	6.1		
Cu Ro Conc 3	37.1	1.89	1.02	0.11	0.32	4.0			3.3	3.2	2.6	3.4		
Cu Ro Conc 4	21.4	1.09	0.98	0.14	0.33	6.0			1.8	2.3	1.6	3.0		
Cu Ro Conc 5	59.3	3.01	0.98	0.24	0.34	4.3			5.0	11.1	4.5	5.9		
Cu Ro Tail	1775.5	90.3	0.26	0.01	0.07	0.9			40.1	13.9	27.6	36.9		
Head (calc.)	1967.0	100	0.59	0.06	0.23	2.2			100	100	100	100		
(direct)			0.60	0.06	0.25	2.4								

Combined Products														
Ro Conc 1	53.5	2.72	10.0	1.58	5.13	36.3			46.5	66.1	60.9	44.8		
Ro Conc 1-2	73.7	3.75	7.77	1.20	3.90	29.9			49.7	69.4	63.7	50.9		
Ro Conc 1-3	110.8	5.63	5.51	0.84	2.70	21.2			53.0	72.6	66.4	54.3		
Ro Conc 1-4	132.2	6.72	4.77	0.73	2.32	18.8			54.8	75.0	67.9	57.3		
Ro Conc 1-5	191.5	9.74	3.60	0.57	1.70	14.3			59.9	86.1	72.4	63.1		

Test No.: **Oxide-F3** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 06/28/2022

Purpose: Rougher kinetics test on oxide ore at natural pH with sulphidization and A-OX100 flotation
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh oxide ore
Grind: 18.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 118 µm **(Comb)**
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne								Time, minutes			pH	Ep
	Na2S		A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										18			8.6	156
Cond.	**650**										**5**		**10.1**	**-170**
Cu Ro 1					35	20		10			1	**2**	10.0	-111
Cu Ro 2								20				**3**	9.7	84
Cond.	**350**										**5**		**10.2**	**-273**
Cu Ro 3					10	15		10			1	**3**	10.1	-189
Cu Ro 4					10			10			1	4	10.0	-82
Cu Ro 5			**100**			**5**					**3**	**3**	**9.7**	**-41**
Total					55	40		50						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: thick froth in Ro 5

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**	**Cu-H_2SO_4**		**Cu**	**S**	**Au**	**Ag**	**Cu-H2SO4**	
Cu Ro Conc 1	47.7	2.44	10.8	1.81	4.61	41.3	7.22		45.9	68.2	55.4	45.2	49.4	
Cu Ro Conc 2	21.1	1.08	2.38	0.29	0.78	15	1.47		4.5	4.8	4.1	7.3	4.5	
Cu Ro Conc 3	37.5	1.92	1.12	0.11	0.35	4.0	0.65		3.7	3.3	3.3	3.4	3.5	
Cu Ro Conc 4	19.8	1.01	0.95	0.12	0.34	5.0	0.68		1.7	1.9	1.7	2.3	1.9	
Cu Ro Conc 5	49.1	2.51	1.06	0.20	0.33	4.6	0.78		4.6	7.8	4.1	5.2	5.5	
Cu Ro Tail	1778.4	91.0	0.25	0.01	0.07	0.9	0.14		39.6	14.1	31.4	36.7	35.2	
Head (calc.)	1953.6	100	0.57	0.06	0.20	2.2	0.36		100	100	100	100	100	
(direct)			0.60	0.06	0.25	2.4	0.46							

Combined Products														
Ro Conc 1	47.7	2.44	10.8	1.81	4.61	41.3	7.22		45.9	68.2	55.4	45.2	49.4	
Ro Conc 1-2	68.8	3.52	8.22	1.34	3.44	33.2	5.46		50.4	73.1	59.5	52.4	53.9	
Ro Conc 1-3	106.3	5.44	5.71	0.91	2.35	22.9	3.76		54.1	76.3	62.9	55.9	57.4	
Ro Conc 1-4	126.1	6.45	4.97	0.78	2.03	20.1	3.28		55.8	78.2	64.6	58.1	59.3	
Ro Conc 1-5	175.2	8.97	3.87	0.62	1.55	15.8	2.57		60.4	85.9	68.6	63.3	64.8	

Test No.: **Oxide-F4** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/12/2022

Purpose: Oxide Cleaner Test
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh oxide ore
Grind: 20 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 119 µm **(Ro tail)**
Regrind: As outlined below. K_{80} = 23.5 µm
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Lime	Na2S	A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										20			8.6	191
Cond.		**650**									**5**		**10.1**	**-152**
Cu Ro 1					35	20		20			1	5	10.0	-103
Cond.		**350**									**5**		**10.1**	**-235**
Cu Ro 2					20	15		10			1	5	10.0	-176
Cu Ro 3			100			5					3	3	9.7	-67
Comb Cu Ro1, 2, 3 Conc:														
Regrind										10			**9.6**	**69**
Cond.	**350**	**65**									**3**		**11.0**	**-96**
Cu Cln1			15+5		8+2	8+2					1+1	3+2	11	**-78**
Cond.	**40**	**35**									**3**		**11**	**-84**
Cu Cln2			10		5	5					1	5	11	-85
Total					60	45		30						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: Cleaner froth not good; A-OX100 impact the froth (poor selectivity)

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**	**Cu-H_2SO_4**		**Cu**	**S**	**Au**	**Ag**		
Cu Cln2 Conc	28.0	1.45	17.6	3.09	7.14	69.3	12.7		41.9	66.5	46.9	44.6		
Cu Cln2 tail	29.0	1.50	1.77	0.24	0.50	10			4.4	5.4	3.4	6.7		
Cu Cln1 Tail	148.1	7.65	1.23	0.13	0.26	5			15.5	14.8	9.0	17.0		
Cu Ro Tail	1730.7	89.40	0.26	0.01	0.10	0.8	0.171		38.3	13.3	40.6	31.8		
Head (calc.)	1935.8	100	0.61	0.07	0.22	2.2			100	100	100	100		
(direct)			0.60	0.06	0.25	2.4	0.46							

Combined Products														
Cu Cln2 Conc	28.0	1.4	17.6	3.09	7.14	69.3			41.9	66.5	46.9	44.6		
Cu Cln1 Conc	57.0	2.9	9.55	1.64	3.76	39.1			46.3	71.9	50.3	51.2		
Cu Ro Conc	205.1	10.6	3.54	0.55	1.23	14.5			61.7	86.7	59.4	68.2		

Test No.: **Oxide-F5** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/20/2022

Purpose: Oxide Cleaner Test
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh oxide ore
Grind: 20 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 119 µm **(Ro tail)**
Regrind: As outlined below. K_{80} = 28.9 µm
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Lime	Na2S	A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										20			8.7	102
Cond.		**650**									**5**		**10.2**	**-188**
Cu Ro 1					35	20		25			1	5	10.1	-108
Cond.		**350**									**5**		**10.2**	**-257**
Cu Ro 2					20	15		10			1	5	10.2	-208
Cu Ro 3			10			5					3	3	9.9	-82
Comb Cu Ro1, 2, 3 Conc:														
Regrind										10			**9.7**	**44**
Cond.	305	65									3		11	**-115**
Cu Cln1					8+2	8+2					1+1	3+2	11	**-80**
Cond.	55	35									3		11	**-210**
Cu Cln2					5	5					1	5	11	-94
Total					60	45		35						

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: good froth

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**			**Cu**	**S**	**Au**	**Ag**		
Cu Cln2 Conc	18.0	0.92	26.2	4.45	13.6	93.2			39.8	60.4	57.5	37.4		
Cu Cln2 tail	19.7	1.01	1.69	0.18	0.47	13			2.8	2.7	2.2	5.7		
Cu Cln1 Tail	151.7	7.76	1.22	0.09	0.20	4.0			15.6	10.3	7.1	13.5		
Cu Ro Tail	1764.3	90.31	0.28	0.02	0.08	1.1			41.7	26.6	33.2	43.3		
Head (calc.)	1953.7	100	0.61	0.07	0.22	2.3			100	100	100	100		
(direct)			0.60	0.06	0.25	2.4								

Combined Products														
Cu Cln2 Conc	18.0	0.9	26.2	4.45	13.6	93.2			39.8	60.4	57.5	37.4		
Cu Cln1 Conc	37.7	1.9	13.4	2.22	6.74	51.3			42.6	63.1	59.7	43.2		
Cu Ro Conc	189.4	9.69	3.64	0.51	1.50	13.4			58.3	73.4	66.8	56.7		

Test No.: **Blend-F1** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/07/2022

Purpose: Rougher flotation with sulphide flotation followed by sulphidization and oxide flotation
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh Blend ore (50:50)
Grind: 15.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 135 µm **(Ro Tail)**
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne								Time, minutes			pH	Ep
	Na2S		A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										15			8.7	246
Cu Ro 1					15	15		20			1	1	8.8	166
Cu Ro 2												2	8.7	290
Cond.	350										5		9.8	-159
Cu Ro 3					15	15		5			1	1	9.7	-83
Cu Ro 4					10	10					1	2	9.6	13
Cu Ro 5			100			5					3	3	9.4	-19
Total														

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: thick froth in Ro 5

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**			**Cu**	**S**	**Au**	**Ag**		
Cu Ro Conc 1	42.2	2.13	19.7	13.40	5.69	65.9			52.6	77.8	54.0	52.1		
Cu Ro Conc 2	22.2	1.12	6.74	4.34	2.10	28			9.5	13.3	10.5	11.6		
Cu Ro Conc 3	32.0	1.61	7.31	0.75	1.48	15			14.8	3.3	10.6	9.0		
Cu Ro Conc 4	24.1	1.22	1.78	0.46	0.72	7			2.7	1.5	3.9	3.2		
Cu Ro Conc 5	61.2	3.09	0.86	0.19	0.35	3.40			3.3	1.6	4.8	3.9		
Cu Ro Tail	1801.2	90.8	0.15	0.02	0.04	0.60			17.1	2.5	16.2	20.2		
Head (calc.)	1982.9	100	0.80	0.37	0.22	2.7			100	100	100	100		
(direct)			0.76	0.37	0.25	2.7								

Combined Products														
Ro Conc 1	42.2	2.13	19.7	13.4	5.69	65.9			52.6	77.8	54.0	52.1		
Ro Conc 1-2	64.4	3.25	15.2	10.3	4.45	52.8			62.1	91.1	64.4	63.7		
Ro Conc 1-3	96.4	4.86	12.6	7.11	3.47	40.3			76.9	94.4	75.1	72.7		
Ro Conc 1-4	120.5	6.08	10.4	5.78	2.92	33.6			79.6	95.9	79.0	75.9		
Ro Conc 1-5	181.7	9.16	7.21	3.90	2.05	23.4			82.9	97.5	83.8	79.8		

Test No.: **Blend-F2** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/07/2022

Purpose: Rougher test with sulphide and oxide flotation together
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh Blend ore (50:50)
Grind: 15.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 140 µm **(Ro tail)**
Regrind: As outlined below.
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Na2S		A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										15			8.8	186
Cond.	300										5		9.8	-142
Cu Ro 1					15	15		20			1	1	9.7	-87
Cu Ro 2												2	9.4	-157
Cond.	200										5		9.9	-198
Cu Ro 3					15	15		5			1	1	9.8	-150
Cu Ro 4					10	10					1	2	9.8	-40
Cu Ro 5			100			5					3	3	9.6	-58
Total														

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: thick froth in Ro 5

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**			**Cu**	**S**	**Au**	**Ag**		
Cu Ro Conc 1	54.6	2.77	19.6	11.3	5.37	58			67.2	82.6	55.6	62.9		
Cu Ro Conc 2	21.6	1.09	7.42	4.03	3.88	28			10.1	11.7	15.9	12.0		
Cu Ro Conc 3	25.8	1.31	1.92	0.28	0.70	5			3.1	1.0	3.4	2.6		
Cu Ro Conc 4	22.7	1.15	0.88	0.25	0.37	4			1.3	0.8	1.6	1.8		
Cu Ro Conc 5	62.9	3.19	0.68	0.19	0.27	2.4			2.7	1.6	3.2	3.0		
Cu Ro Tail	1785.5	90.5	0.14	0.01	0.06	0.5			15.7	2.4	20.3	17.7		
Head (calc.)	1973.1	100	0.81	0.38	0.3	2.5			100	100	100	100		
(direct)			0.76	0.37	0.25	2.7								

Combined Products														
Ro Conc 1	54.6	2.77	19.6	11.3	5.37	57.9			67.2	82.6	55.6	62.9		
Ro Conc 1-2	76.2	3.86	16.1	9.24	4.95	49.4			77.3	94.3	71.5	74.9		
Ro Conc 1-3	102.0	5.17	12.5	6.97	3.87	38.2			80.4	95.2	74.9	77.4		
Ro Conc 1-4	124.7	6.32	10.4	5.75	3.24	32.0			81.6	96.0	76.5	79.2		
Ro Conc 1-5	187.6	9.51	7.16	3.89	2.24	22.1			84.3	97.6	79.7	82.3		

Test No.: **Blend-F3** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/12/2022

Purpose: Cleaner
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh Blend ore (50:50)
Grind: 15.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 137 µm **(Ro tail)**
Regrind: As outlined below. K_{80} = 31.5 µm
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Lime	Na2S	A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										15			8.7	290
Cond.		**300**									**5**		**9.6**	**-140**
Cu Ro 1					15	15		20			1	3	9.6	-72
Cond.		**200**									**5**		**9.8**	**-205**
Cu Ro 2					25	25		5			1	3	9.8	-149
Cu Ro 3			100			5					3	3	9.5	-45
Comb Cu Ro1, 2, 3 Conc:														
Regrind										12			**9.3**	**171**
Cond.	**355**	**65**									**3**		**11.0**	**-98**
Cu Cln1			15+5		8+2	8+2					1+1	3+3	11	**-88**
Cond.	**75**	**35**									**3**		**11**	**-194**
Cu Cln2			10		5	5					1	5	11	-110
Total														

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: Cleaner froth not good; A-OX100 impact the froth (poor selectivity)

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**	**Cu-H_2SO_4**		**Cu**	**S**	**Au**	**Ag**		
Cu Cln2 Conc	40.0	2.02	26.3	12.3	7.41	82.0	4.44		67.6	78.9	55.8	61.5		
Cu Cln2 tail	37.0	1.87	4.49	2.07	2.52	18			10.7	12.3	17.5	12.5		
Cu Cln1 Tail	173.0	8.74	0.55	0.12	0.22	3.0			6.1	3.3	7.2	9.7		
Cu Ro Tail	1730.0	87.37	0.14	0.02	0.06	<0.5	0.102		15.6	5.5	19.5	16.2		
Head (calc.)	1980.0	100	0.79	0.32	0.27	2.7			100	100	100	100		
(direct)			0.76	0.37	0.25	2.7	0.282							

Combined Products														
Cu Cln2 Conc	40.0	2.0	26.3	12.3	7.41	82.0			67.6	78.9	55.8	61.5		
Cu Cln1 Conc	77.0	3.9	15.8	7.38	5.06	51.2			78.3	91.1	73.3	74.0		
Cu Ro Conc	250.0	12.6	5.25	2.36	1.71	17.9			84.4	94.5	80.5	83.8		

Test No.: **Blend-F4** **Project No.**: 19248-01 **Operator**: **Max** **Date**: 07/20/2022

Purpose: Cleaner
Procedure: As outlined below
Feed: 2 kg of minus 10 mesh Blend ore (50:50)
Grind: 15.0 min / 2 kg @ 65% (1077 ml H2O) solids in a laboratory ball mill (#3) K_{80} = 137 µm **(Ro tail)**
Regrind: As outlined below. K_{80} = 27.8 µm
Comments:

Conditions:

Stage	Reagents added, grams per tonne									Time, minutes			pH	Ep
	Lime	Na2S	A-OX100		PAX	3418A		MIBC		Grind	Cond.	Froth		
Primary Grind										15			8.9	119
Cond.		300									5		**9.9**	**-184**
Cu Ro 1					15	15		20			1	3	9.8	-90
Cond.		200									5		**9.9**	**-226**
Cu Ro 2					25	25		5			1	3	9.9	-165
Cu Ro 3			5			5					3	3	9.7	-69
Comb Cu Ro1, 2, 3 Conc:														
Regrind										12			**9.3**	**46**
Cond.	280	65									3		11.1	**-149**
Cu Cln1					8+2	8+2					1+1	3+2	11	**-77**
Cond.	30	35									3		11	**-134**
Cu Cln2					5	5					1	4	11	-98
Total														

Stage	Rougher		
Flotation Cell	1000g-D1 (4.4L)		
Speed: rpm	1800		

Observations: good froth

Metallurgical Balance

Product	**Weight**		**Assays, %, g/t**						**% Distribution**					
	g	%	**Cu**	**S**	**Au**	**Ag**	**Cu-H_2SO_4**		**Cu**	**S**	**Au**	**Ag**		
Cu Cln2 Conc	28.6	1.45	40.8	23.3	12.4	120.0	7.16		75.3	90.8	65.7	66.2		
Cu Cln2 tail	13.1	0.66	2.39	0.98	0.81	16			2.0	1.8	2.0	4.0		
Cu Cln1 Tail	111.9	5.67	0.70	0.16	0.26	4.0			5.1	2.4	5.4	8.6		
Cu Ro Tail	1821.5	92.22	0.15	0.02	0.08	0.6	0.11		17.6	5.0	27.0	21.1		
Head (calc.)	1975.1	100	0.78	0.37	0.27	2.6			100	100	100	100		
(direct)			0.76	0.37	0.25	2.7	0.282							

Combined Products														
Cu Cln2 Conc	28.6	1.4	40.8	23.3	12.4	120.0			75.3	90.8	65.7	66.2		
Cu Cln1 Conc	41.7	2.1	28.7	16.3	8.76	87.3			77.3	92.6	67.6	70.3		
Cu Ro Conc	153.6	7.78	8.31	4.54	2.57	26.6			82.4	95.0	73.0	78.9		

Test No.:Blend-LCT1 Project No.: 19249-01 Date: 08-Aug-22

Purpose: Locked Cycle Test on Blend Sample
Procedure: As outlined below
Feed: 6x2 kg of minus 10 mesh Blend sample (Sulphide:Oxide = 60:40)
Grind: 15.0 min / 2 kg @ 65% solids in a laboratory ball mill #3 (1077 ml H2O) K_{80} = 140 µm (Ro Tail)
Regrind: As outlined below. K_{80} = 30.8 µm
Comments:

Conditions:

Stage	Reagents added, grams per tonne									pH	Ep
	Lime	Na2S	A-OX100		PAX	3418A		MIBC	Cond.	Froth		
Primary Grind											8.8	55
Cond.		300							5		9.6	-197
Cu Ro 1					15	15		20	1	3	9.6	-123
Cond.		200							5		9.8	-267
Cu Ro 2					25	25		5	1	3	9.8	-195
Cu Ro 3			5			5		5	3	3	9.5	-93
Comb Cu Ro1, 2, 3 Conc												
Regrind											9.5	-24
Cond.	325	65							3		11	-98
Cu Cln1					8+2	8+2			1+1	3+2	11	-113
Cond.	60	35							3		11	-170
Cu Cln2					5	5			1	4	11	-126
Total												

Stage	Rougher	1st Cleaner	2nd Cleaner
Flotation Cell	1000g-D1 (4.4L)	500g-D1 (2L)	250g-D1 (1L)
Speed: rpm	1800	1200	900

Observations: good froth good froth

Metallurgical Balance: Blend-LCT1

Product		Weight		Assays %, g/t					% Distribution			
		g	%	Cu	S	Au	Ag	Cu-H_2SO_4	Cu	S	Au	Ag
LCT1-A Cu Cln2 Conc		31.5	0.27	41.2	24.9	9.69	119		13.2	15.2	10.6	12.0
LCT1-B Cu Cln2 Conc		32.7	0.28	41.1	24.1	9.24	115		13.6	15.2	10.5	12.1
LCT1-C Cu Cln2 Conc		33.8	0.29	40.2	24.1	8.69	105		13.8	15.8	10.2	11.4
LCT1-D Cu Cln2 Conc		33.2	0.28	39.8	24.3	9.89	103		13.4	15.6	11.4	11.0
LCT1-E Cu Cln2 Conc		33.1	0.28	40.6	23.5	12.4	106		13.6	15.0	14.3	11.2
LCT1-F Cu Cln2 Conc		33.1	0.28	39.8	23.1	9.57	103	5.29	13.4	14.8	11.0	10.9
LCT1-F Cu Cln2 Tail		19.7	0.17	1.38	0.70	0.49	8		0.3	0.3	0.3	0.5
LCT1-A Cu Cln1 Tail		160.9	1.36	0.49	0.14	0.19	3		0.8	0.4	1.1	1.5
LCT1-B Cu Cln1 Tail		178.4	1.51	0.51	0.17	0.20	4		0.9	0.6	1.2	2.3
LCT1-C Cu Cln1 Tail		172.3	1.46	0.55	0.16	0.20	3		1.0	0.5	1.2	1.7
LCT1-D Cu Cln1 Tail		148.3	1.25	0.51	0.15	0.21	3		0.8	0.4	1.1	1.4
LCT1-E Cu Cln1 Tail		157.0	1.33	0.51	0.15	0.21	3		0.8	0.5	1.1	1.5
LCT1-F Cu Cln1 Tail		155.8	1.32	0.53	0.18	0.21	4		0.8	0.5	1.1	2.0
LCT1-A Cu Ro Tail		1778.4	15.03	0.13	0.03	0.08	0.6		2.3	1.0	5.0	3.4
LCT1-B Cu Ro Tail		1762.0	14.89	0.13	0.03	0.06	0.6		2.3	1.0	3.7	3.4
LCT1-C Cu Ro Tail		1789.2	15.12	0.14	0.02	0.06	0.6		2.5	0.7	3.7	3.4
LCT1-D Cu Ro Tail		1769.8	14.96	0.12	0.02	0.06	0.6		2.2	0.7	3.7	3.4
LCT1-E Cu Ro Tail		1779.8	15.04	0.12	0.02	0.07	0.6		2.2	0.7	4.3	3.4
LCT1-F Cu Ro Tail		1763.4	14.90	0.12	0.03	0.07	0.6	0.081	2.1	1.0	4.3	3.4
Head (calc.)		11832.4	100	0.83	0.44	0.24	2.64		100	100	100	100
(direct)				0.80	0.43	0.24	2.76	0.245				

Projected metallurgy - Blend LCT1 based on cycles 4-6

Product	Weight		Assays %, g/t					% Distribution			
	g	%	Cu	S	Au	Ag		Cu	S	Au	Ag
Cu Cln2 Conc	99.4	1.69	40.1	23.6	10.6	104		82.0	92.2	70.1	68.6
Cu Cln1 Tail	461.1	7.9	0.52	0.16	0.21	3.34		4.9	2.9	6.4	10.2
Cu Ro Tail	5313.0	90.5	0.12	0.02	0.07	0.60		13.1	4.9	23.5	21.2
Feed	5873.5	100	0.83	0.43	0.26	2.56		100	100	100	100

Stability Check

Cycle	Wt %	Cu	S	Au	Ag
A	99.9	98	100	100	102
B	100.1	101	101	93	106
C	101.2	104	102	91	99
D	98.9	98	100	97	95
E	99.9	100	97	119	97
F	99.0	98	98	99	98
ave 3-6	99.8	100	99	101	97
ave 4-6	99.3	99	99	105	97
ave 5-6	99.4	99	98	109	98

Date: **6/08/22**

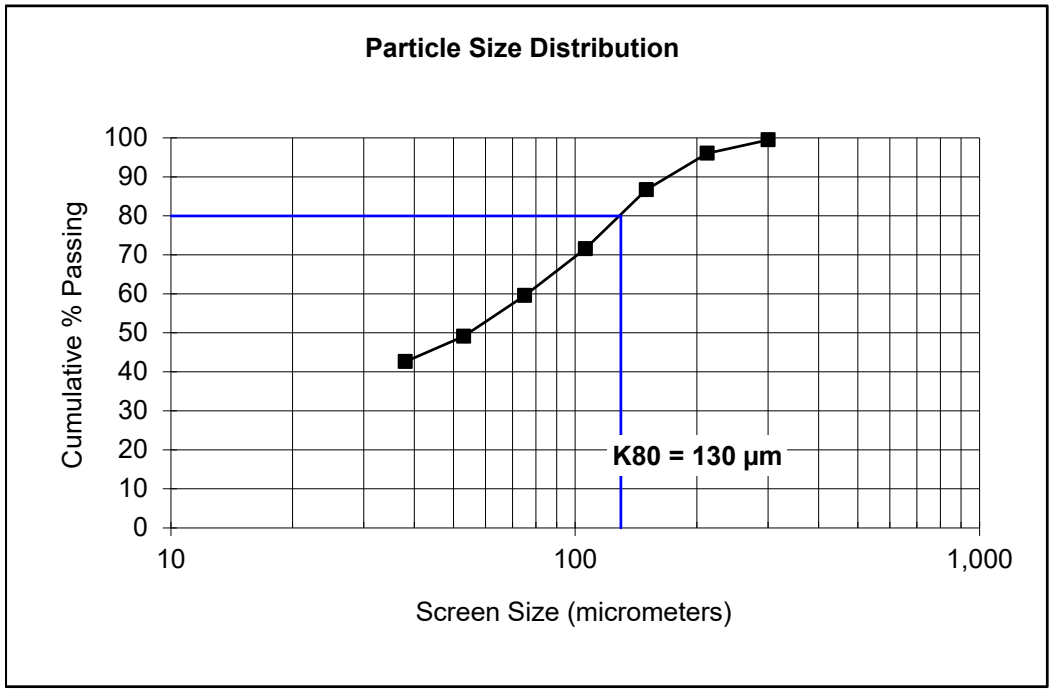
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Combined **Test No:** Sulfide-F1 **Operator:** IH

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	1.0	0.5	0.5	99.5
65	212	6.9	3.5	4.0	96.0
100	150	18.6	9.3	13.3	86.7
150	106	30.1	15.1	28.4	71.6
200	75	23.9	12.0	40.5	59.5
270	53	20.8	10.5	50.9	49.1
400	38	12.9	6.5	57.4	42.6
Pan	-38	84.8	42.6	100.0	0.0
Total	**-**	**199.0**	100.0	**-**	**-**
K80	**130**				



Date: **6/16/22**

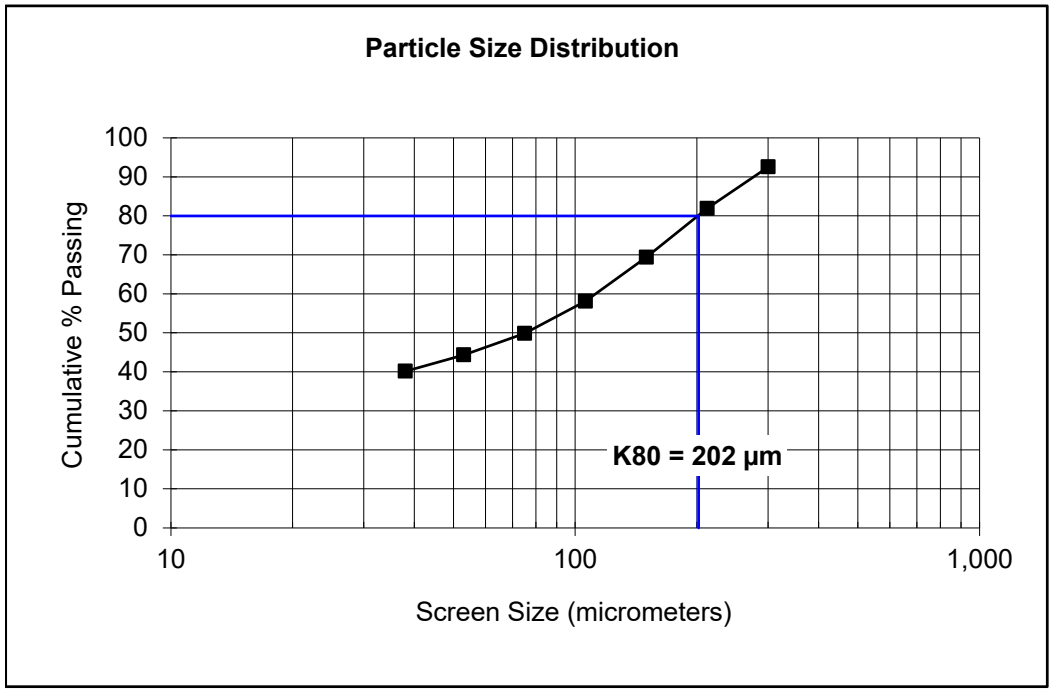
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Combined **Test No:** Sulfide-F2 **Operator:** IH

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	14.8	7.4	7.4	92.6
65	212	21.2	10.7	18.1	81.9
100	150	24.9	12.5	30.6	69.4
150	106	22.4	11.3	41.9	58.1
200	75	16.4	8.2	50.2	49.8
270	53	11.0	5.5	55.7	44.3
400	38	8.3	4.2	59.9	40.1
Pan	-38	79.8	40.1	100.0	0.0
Total	**-**	**198.8**	100.0	**-**	**-**
K80	**202**				



Date: **6/16/22**

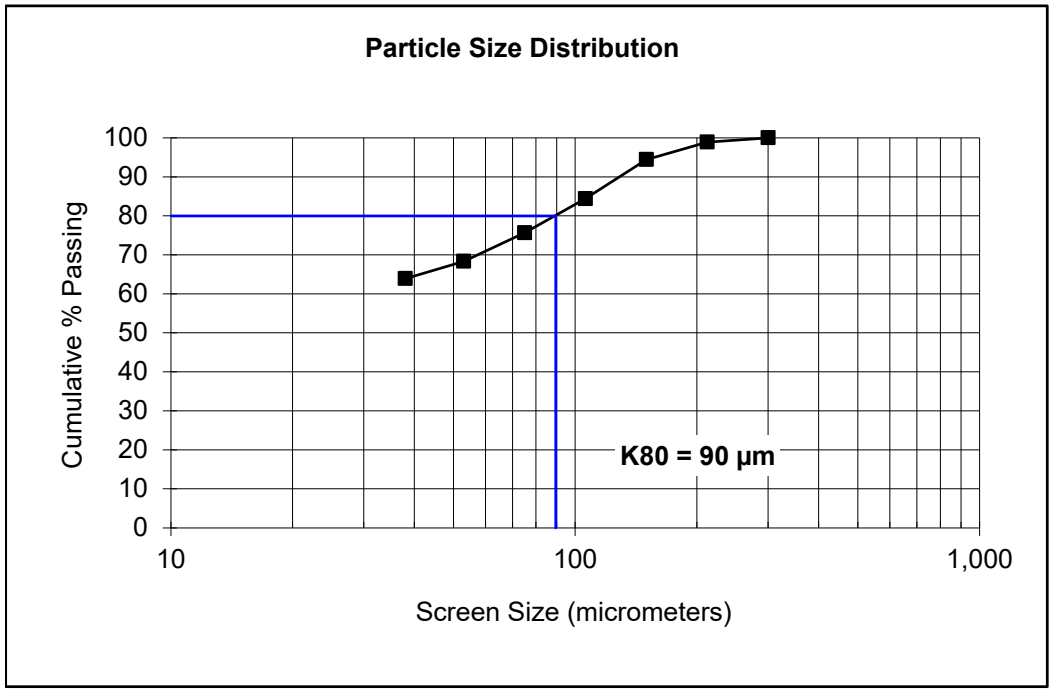
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Combined **Test No:** Sulfide-F3 **Operator:** IH

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	2.2	1.1	1.1	98.9
100	150	8.9	4.5	5.6	94.4
150	106	20.0	10.0	15.6	84.4
200	75	17.4	8.7	24.3	75.7
270	53	14.6	7.3	31.7	68.3
400	38	8.8	4.4	36.1	63.9
Pan	-38	127.3	63.9	100.0	0.0
Total	**-**	**199.2**	100.0	**-**	**-**
K80	**90**				



Date: **6/16/22**

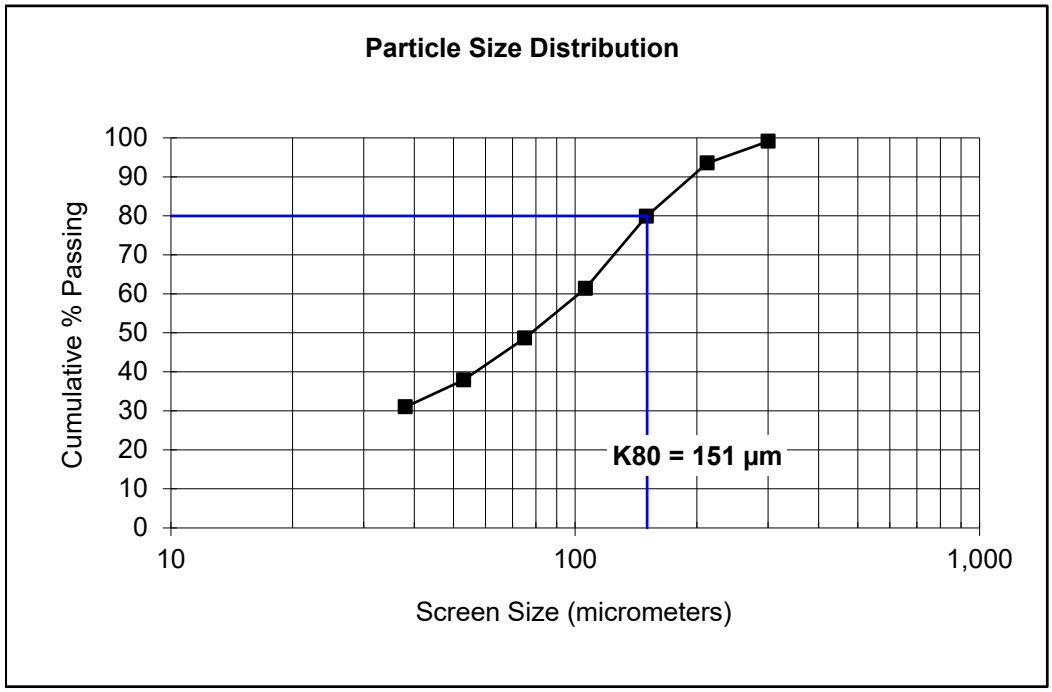
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Combined **Test No:** Oxide- F1 **Operator:** IH

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	1.4	0.9	0.9	99.1
65	212	9.0	5.6	6.5	93.5
100	150	21.9	13.7	20.1	79.9
150	106	29.7	18.5	38.7	61.3
200	75	20.4	12.7	51.4	48.6
270	53	17.2	10.7	62.1	37.9
400	38	11.1	6.9	69.0	31.0
Pan	-38	49.7	31.0	100.0	0.0
Total	**-**	**160.4**	100.0	**-**	**-**
K80	**151**				



Date: **6/30/22**

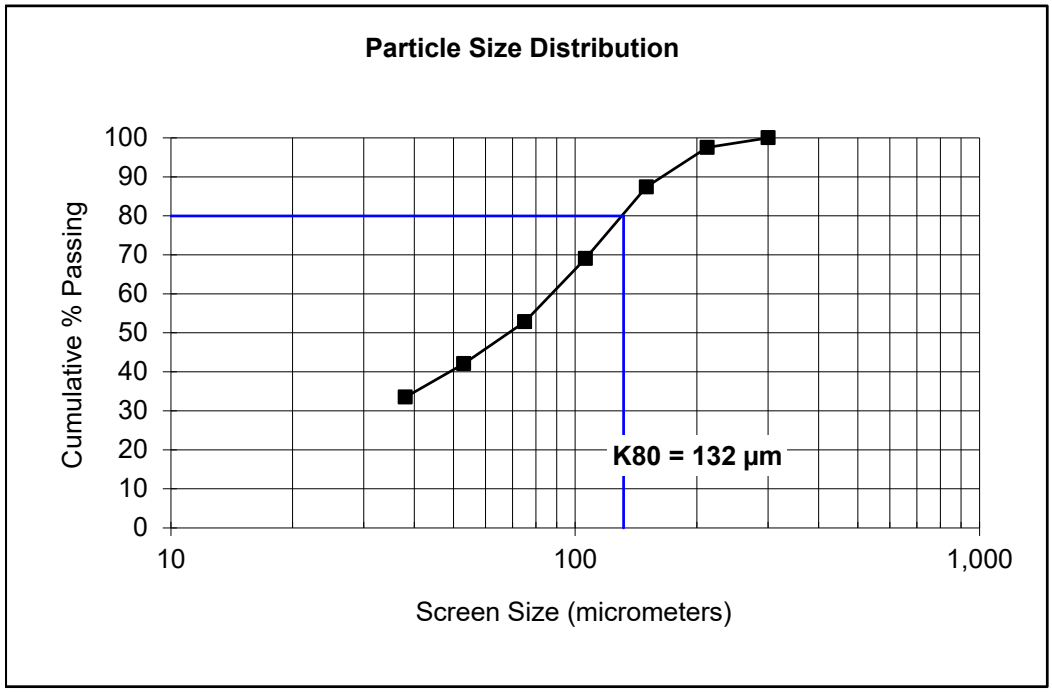
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Combined **Test No:** Oxide- F2 **Operator:** IH

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	4.9	2.5	2.5	97.5
100	150	20.0	10.1	12.6	87.4
150	106	36.2	18.3	31.0	69.0
200	75	32.0	16.2	47.2	52.8
270	53	21.2	10.7	57.9	42.1
400	38	16.9	8.6	66.5	33.5
Pan	-38	66.1	33.5	100.0	0.0
Total	**-**	**197.3**	100.0	**-**	**-**
K80	**132**				



Date: **6/30/22**

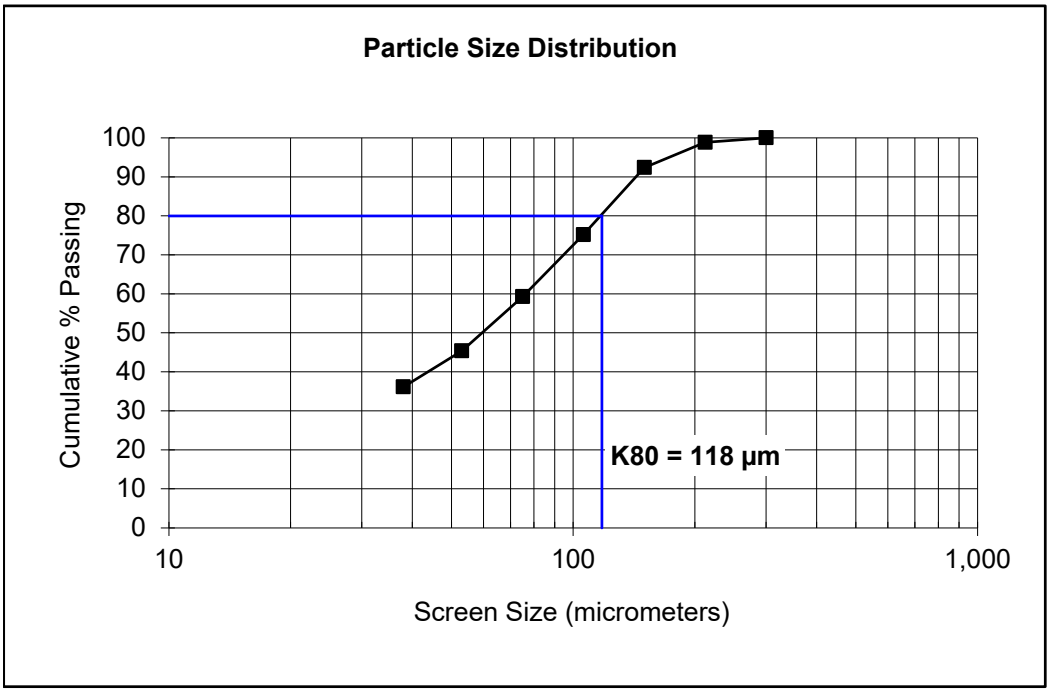
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Combined **Test No:** Oxide- F3 **Operator:** IH

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	2.3	1.2	1.2	98.8
100	150	12.7	6.5	7.6	92.4
150	106	33.8	17.2	24.8	75.2
200	75	31.2	15.9	40.7	59.3
270	53	27.4	13.9	54.7	45.3
400	38	18.1	9.2	63.9	36.1
Pan	-38	71.0	36.1	100.0	0.0
Total	**-**	**196.5**	100.0	**-**	**-**
K80	**118**				



Date: **7/13/22**

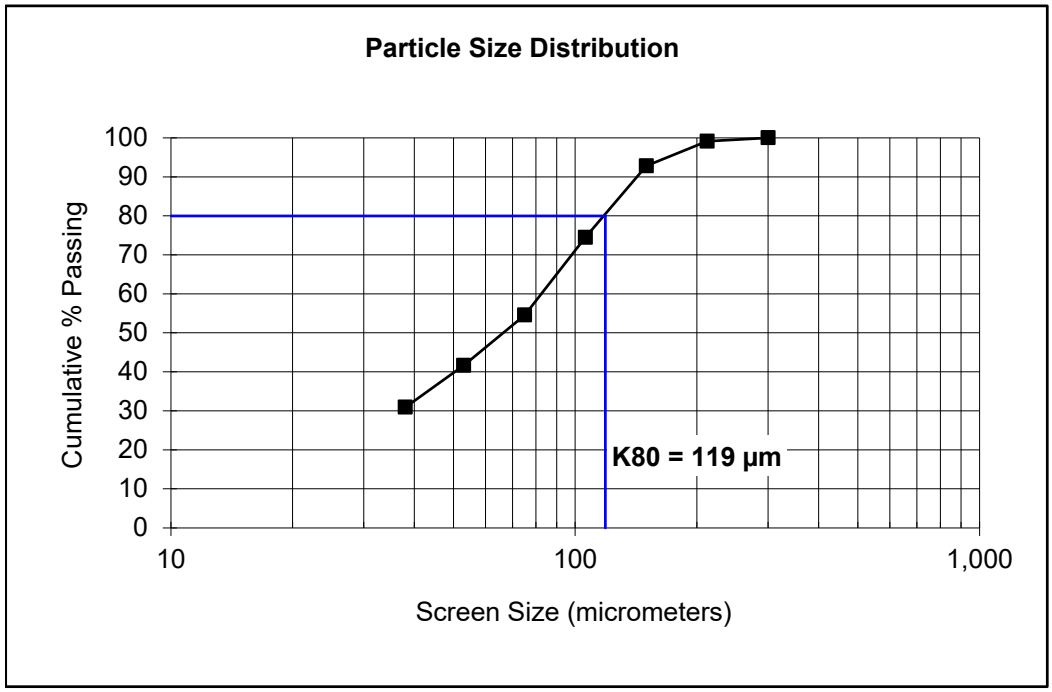
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Ro. Tail **Test No:** Oxide-F4 **Operator:** IH/MA

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.0	0.0	0.0	100.0
65	212	2.2	0.9	0.9	99.1
100	150	15.8	6.3	7.2	92.8
150	106	45.9	18.3	25.5	74.5
200	75	49.9	19.9	45.5	54.5
270	53	32.3	12.9	58.4	41.6
400	38	26.8	10.7	69.1	30.9
Pan	-38	77.4	30.9	100.0	0.0
Total	**-**	**250.3**	100.0	**-**	**-**
K80	**119**				



Date: **7/11/22**

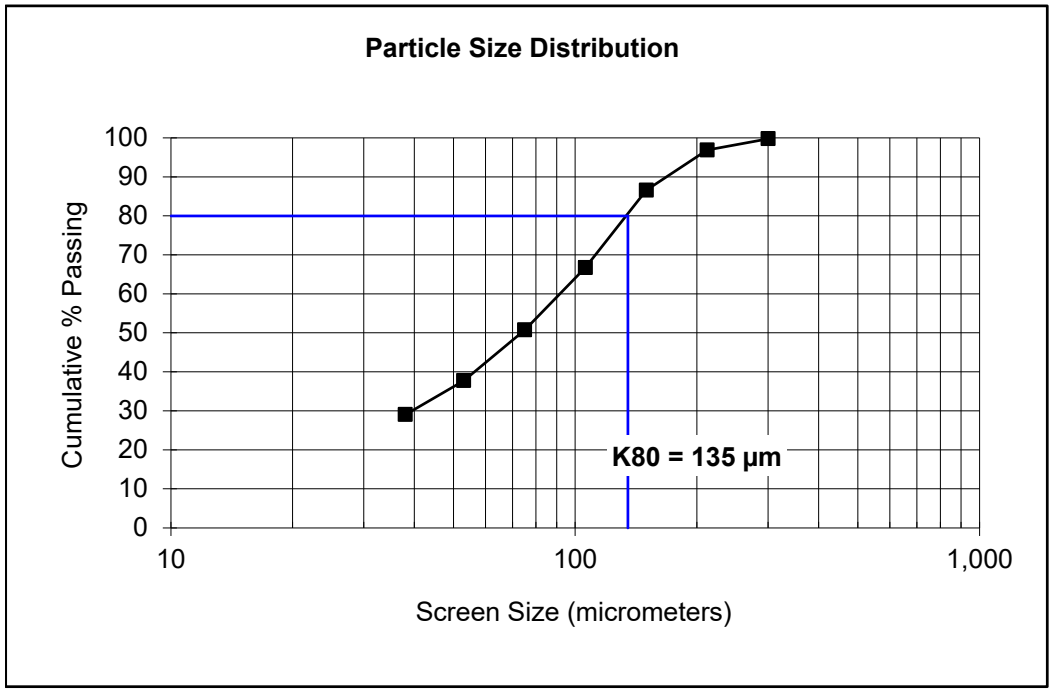
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Ro. Tail **Test No:** Blend-F1 **Operator:** IH/MA

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.7	0.3	0.3	99.7
65	212	8.0	2.9	3.1	96.9
100	150	28.5	10.3	13.4	86.6
150	106	55.0	19.9	33.3	66.7
200	75	44.3	16.0	49.3	50.7
270	53	36.0	13.0	62.3	37.7
400	38	24.1	8.7	71.0	29.0
Pan	-38	80.4	29.0	100.0	0.0
Total	**-**	**277.0**	100.0	**-**	**-**
K80	**135**				



Date: **7/11/22**

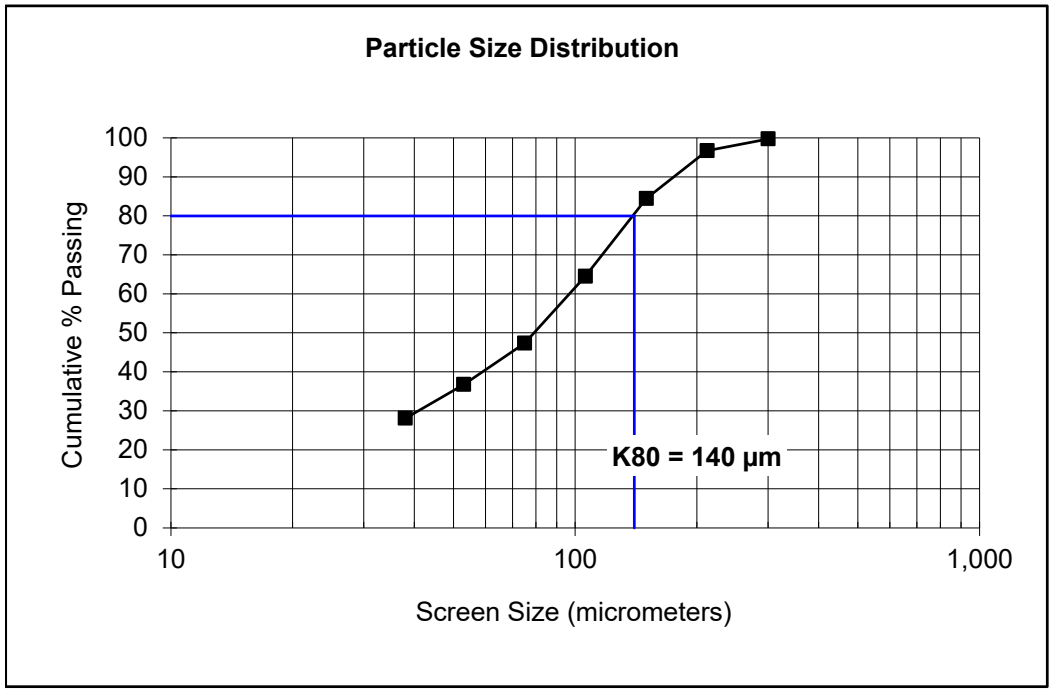
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Ro. Tail **Test No:** Blend-F2 **Operator:** IH/MA

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.8	0.3	0.3	99.7
65	212	8.4	3.0	3.3	96.7
100	150	34.2	12.3	15.6	84.4
150	106	55.6	19.9	35.5	64.5
200	75	47.8	17.1	52.7	47.3
270	53	29.6	10.6	63.3	36.7
400	38	24.1	8.6	71.9	28.1
Pan	-38	78.3	28.1	100.0	0.0
Total	**-**	**278.8**	100.0	**-**	**-**
K80	**140**				



Date: **7/13/22**

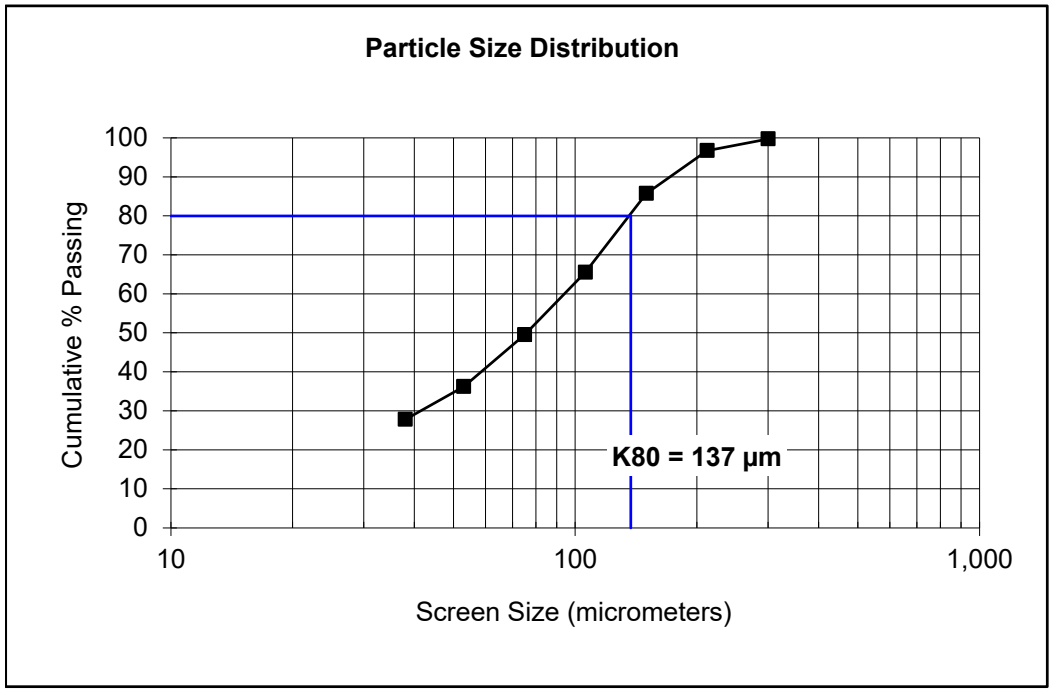
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Ro. Tail **Test No:** Blend-F3 **Operator:** IH/MA

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.7	0.3	0.3	99.7
65	212	8.0	3.0	3.3	96.7
100	150	29.2	11.0	14.3	85.7
150	106	53.6	20.2	34.5	65.5
200	75	42.5	16.0	50.5	49.5
270	53	35.3	13.3	63.8	36.2
400	38	22.3	8.4	72.2	27.8
Pan	-38	73.8	27.8	100.0	0.0
Total	**-**	**265.4**	100.0	**-**	**-**
K80	**137**				



Date: **8/15/22**

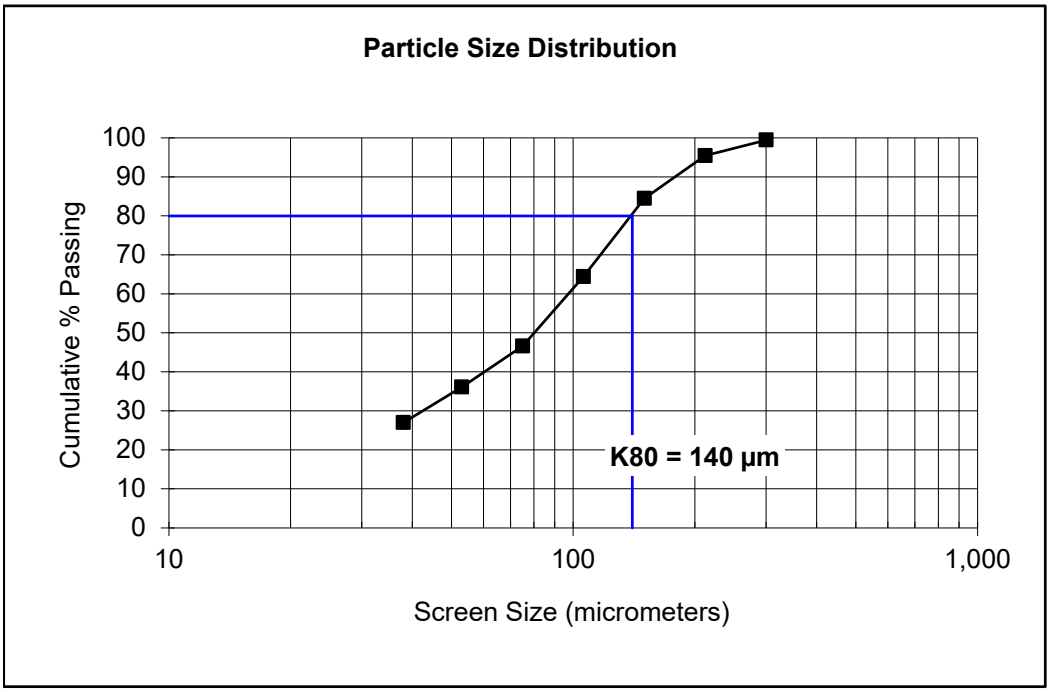
SGS Minerals Services
Size Distribution Analysis

Project No. **19248-01**

Sample: Ro. Tail **Test No:** LCT1- F **Operator:** IH

Mill: Ball Mill #3 **%Solids:** 65 **Weight:** 2 Kg

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	1.0	0.6	0.6	99.4
65	212	7.0	4.0	4.6	95.4
100	150	19.2	11.0	15.6	84.4
150	106	35.1	20.1	35.6	64.4
200	75	31.1	17.8	53.4	46.6
270	53	18.4	10.5	63.9	36.1
400	38	15.9	9.1	73.0	27.0
Pan	-38	47.2	27.0	100.0	0.0
Total	**-**	**174.9**	100.0	**-**	**-**
K80	**140**				



Size Analysis Report (MET group)

SGS Canada Inc

Malvern

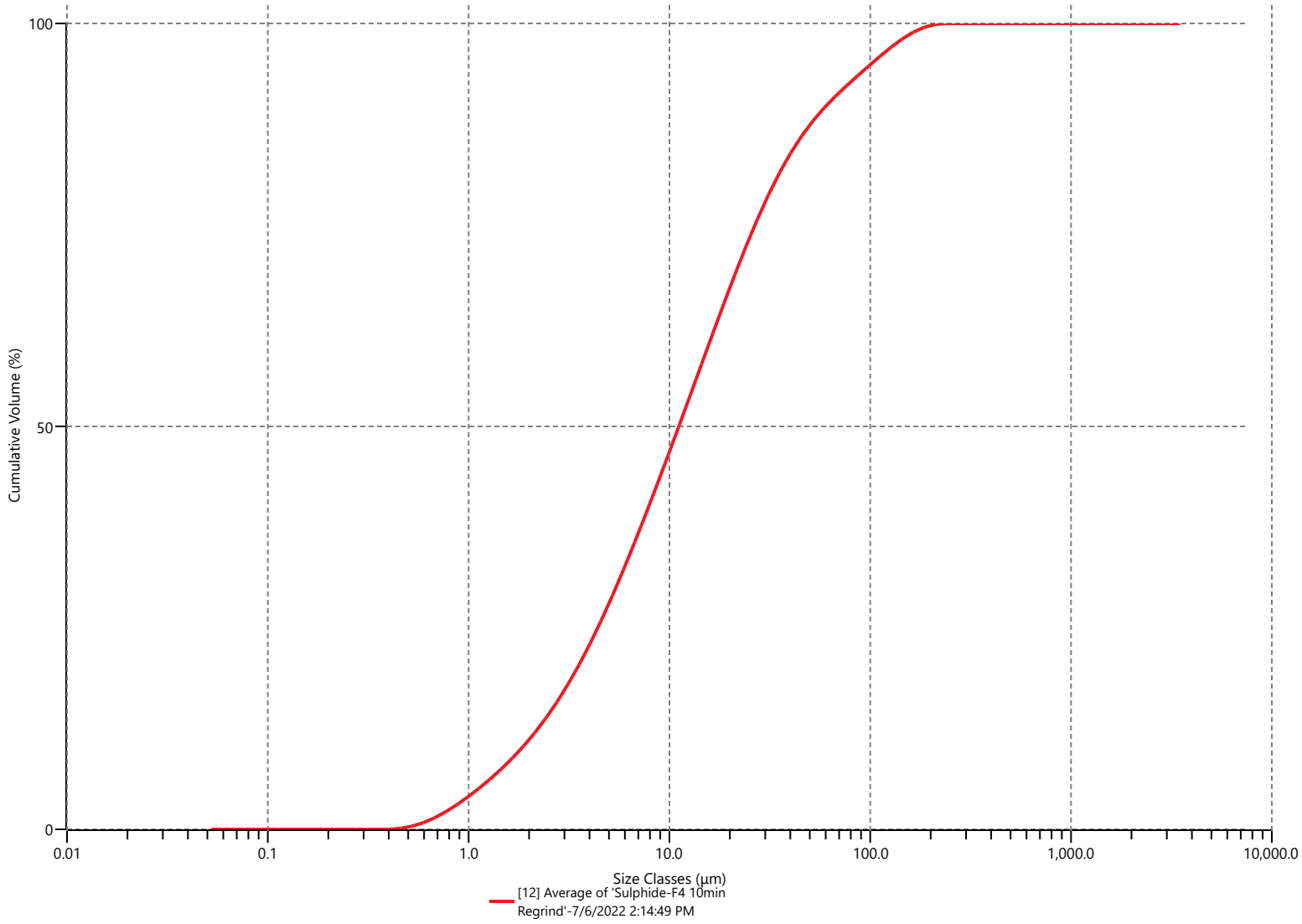
Sample Name	Average of 'Sulphide-F4 10min Regrind'
SOP File Name	19248-01 Cu.msop
Dispersant Name	Water
Analysis Sensitivity	Normal

Laser Obscuration	28.33 %
Result Units	Volume
Result Source	Averaged
Dv (80)	33.0 µm

Operator Name	Max_Ahn

Measurement Date	***7/6/2022***

Undersize



Size Analysis Report (MET group)

SGS Canada Inc

Malvern

Result

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.113	0.00	1.28	1.25	14.5	3.78	163	0.62	1850	0.00
0.0114	0.00	0.128	0.00	1.45	1.36	16.4	3.73	186	0.36	2100	0.00
0.0129	0.00	0.146	0.00	1.65	1.49	18.7	3.64	211	0.11	2390	0.00
0.0147	0.00	0.166	0.00	1.88	1.64	21.2	3.50	240	0.00	2710	0.00
0.0167	0.00	0.188	0.00	2.13	1.81	24.1	3.30	272	0.00	3080	0.00
0.0189	0.00	0.214	0.00	2.42	2.01	27.4	3.05	310	0.00	3500	
0.0215	0.00	0.243	0.00	2.75	2.22	31.1	2.76	352	0.00		
0.0244	0.00	0.276	0.00	3.12	2.44	35.3	2.45	400	0.00		
0.0278	0.00	0.314	0.00	3.55	2.66	40.1	2.14	454	0.00		
0.0315	0.00	0.357	0.00	4.03	2.87	45.6	1.85	516	0.00		
0.0358	0.00	0.405	0.13	4.58	3.07	51.8	1.61	586	0.00		
0.0407	0.00	0.460	0.26	5.21	3.24	58.9	1.43	666	0.00		
0.0463	0.00	0.523	0.43	5.92	3.39	66.9	1.31	756	0.00		
0.0526	0.00	0.594	0.60	6.72	3.51	76.0	1.25	859	0.00		
0.0597	0.00	0.675	0.75	7.64	3.60	86.4	1.22	976	0.00		
0.0679	0.00	0.767	0.87	8.68	3.68	98.1	1.19	1110	0.00		
0.0771	0.00	0.872	0.98	9.86	3.73	111	1.14	1260	0.00		
0.0876	0.00	0.991	1.07	11.2	3.77	127	1.03	1430	0.00		
0.0995	0.00	1.13	1.15	12.7	3.79	144	0.85	1630	0.00		

Size Analysis Report (MET group)

SGS Canada Inc

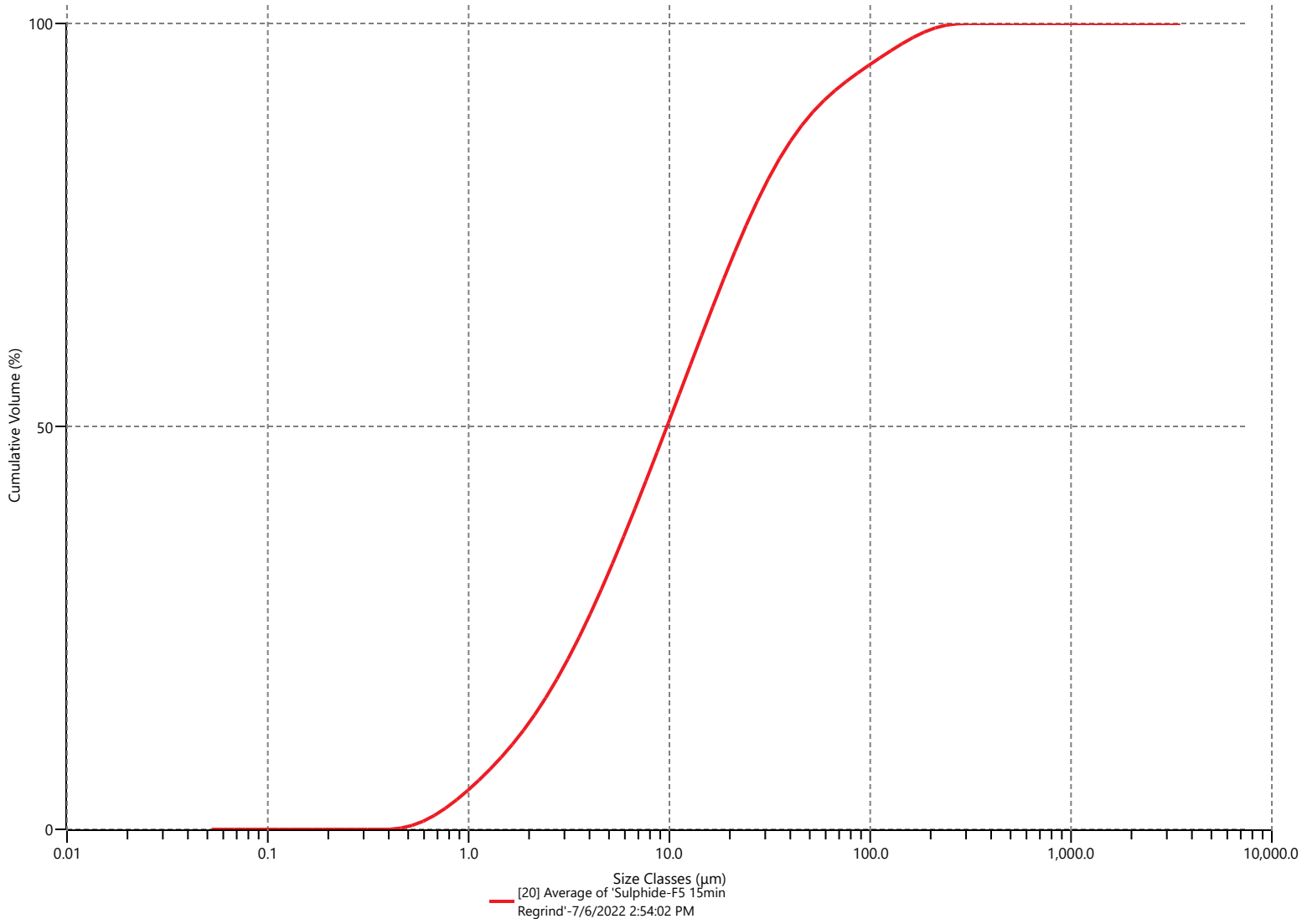
Sample Name	Average of 'Sulphide-F5 15min Regrind'
SOP File Name	19248-01 Cu.msop
Dispersant Name	Water
Analysis Sensitivity	Normal

Laser Obscuration	21.03 %
Result Units	Volume
Result Source	Averaged
Dv (80)	30.1 µm

Operator Name	Max_Ahn

Measurement Date	***7/6/2022***

Undersize



Size Analysis Report (MET group)

SGS Canada Inc

Result

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.113	0.00	1.28	1.47	14.5	3.58	163	0.67	1850	0.00
0.0114	0.00	0.128	0.00	1.45	1.60	16.4	3.50	186	0.52	2100	0.00
0.0129	0.00	0.146	0.00	1.65	1.75	18.7	3.38	211	0.34	2390	0.00
0.0147	0.00	0.166	0.00	1.88	1.92	21.2	3.22	240	0.17	2710	0.00
0.0167	0.00	0.188	0.00	2.13	2.11	24.1	3.02	272	0.03	3080	0.00
0.0189	0.00	0.214	0.00	2.42	2.31	27.4	2.77	310	0.00	3500	
0.0215	0.00	0.243	0.00	2.75	2.51	31.1	2.50	352	0.00		
0.0244	0.00	0.276	0.00	3.12	2.70	35.3	2.21	400	0.00		
0.0278	0.00	0.314	0.00	3.55	2.89	40.1	1.93	454	0.00		
0.0315	0.00	0.357	0.00	4.03	3.06	45.6	1.66	516	0.00		
0.0358	0.00	0.405	0.16	4.58	3.20	51.8	1.43	586	0.00		
0.0407	0.00	0.460	0.33	5.21	3.33	58.9	1.25	666	0.00		
0.0463	0.00	0.523	0.52	5.92	3.42	66.9	1.11	756	0.00		
0.0526	0.00	0.594	0.72	6.72	3.50	76.0	1.02	859	0.00		
0.0597	0.00	0.675	0.90	7.64	3.55	86.4	0.96	976	0.00		
0.0679	0.00	0.767	1.04	8.68	3.59	98.1	0.93	1110	0.00		
0.0771	0.00	0.872	1.16	9.86	3.62	111	0.90	1260	0.00		
0.0876	0.00	0.991	1.27	11.2	3.63	127	0.86	1430	0.00		
0.0995	0.00	1.13	1.36	12.7	3.62	144	0.79	1630	0.00		

Size Analysis Report (MET group)

SGS Canada Inc

Malvern

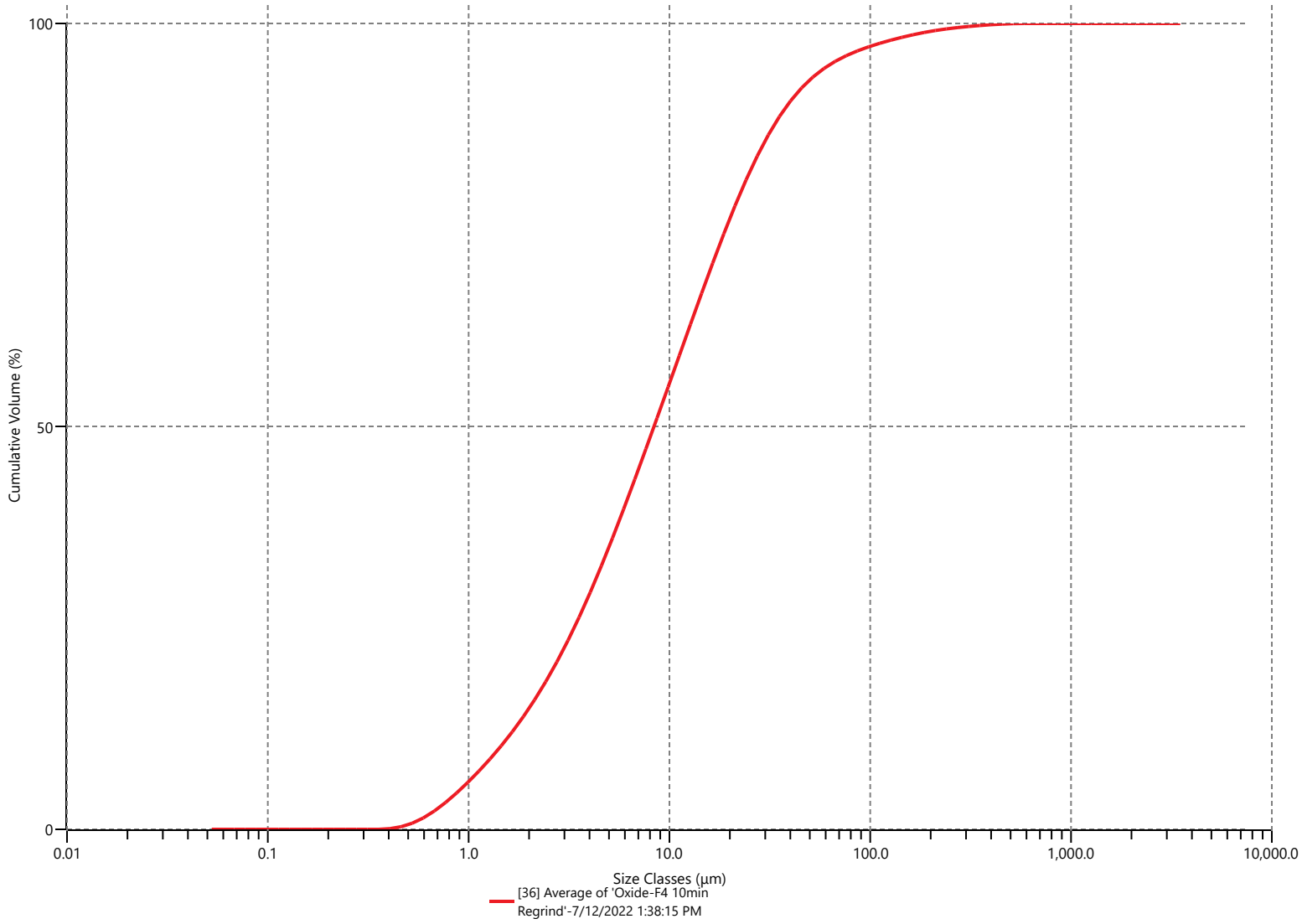
Sample Name	Average of 'Oxide-F4 10min Regrind'
SOP File Name	19248-01 Cu.msop
Dispersant Name	Water
Analysis Sensitivity	Normal

Laser Obscuration	27.88 %
Result Units	Volume
Result Source	Averaged
Dv (80)	23.5 µm

Operator Name	Max_Ahn

Measurement Date	***7/12/2022***

Undersize



Size Analysis Report (MET group)

SGS Canada Inc

Malvern

Result

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.113	0.00	1.28	1.62	14.5	3.76	163	0.28	1850	0.00
0.0114	0.00	0.128	0.00	1.45	1.75	16.4	3.64	186	0.24	2100	0.00
0.0129	0.00	0.146	0.00	1.65	1.90	18.7	3.46	211	0.20	2390	0.00
0.0147	0.00	0.166	0.00	1.88	2.06	21.2	3.23	240	0.16	2710	0.00
0.0167	0.00	0.188	0.00	2.13	2.25	24.1	2.95	272	0.14	3080	0.00
0.0189	0.00	0.214	0.00	2.42	2.45	27.4	2.63	310	0.12	3500	
0.0215	0.00	0.243	0.00	2.75	2.67	31.1	2.29	352	0.10		
0.0244	0.00	0.276	0.00	3.12	2.88	35.3	1.94	400	0.07		
0.0278	0.00	0.314	0.00	3.55	3.09	40.1	1.62	454	0.06		
0.0315	0.00	0.357	0.08	4.03	3.29	45.6	1.33	516	0.02		
0.0358	0.00	0.405	0.23	4.58	3.45	51.8	1.08	586	0.00		
0.0407	0.00	0.460	0.44	5.21	3.59	58.9	0.87	666	0.00		
0.0463	0.00	0.523	0.66	5.92	3.70	66.9	0.71	756	0.00		
0.0526	0.00	0.594	0.87	6.72	3.77	76.0	0.59	859	0.00		
0.0597	0.00	0.675	1.05	7.64	3.83	86.4	0.50	976	0.00		
0.0679	0.00	0.767	1.19	8.68	3.86	98.1	0.44	1110	0.00		
0.0771	0.00	0.872	1.31	9.86	3.88	111	0.39	1260	0.00		
0.0876	0.00	0.991	1.41	11.2	3.88	127	0.35	1430	0.00		
0.0995	0.00	1.13	1.51	12.7	3.84	144	0.32	1630	0.00		

Size Analysis Report (MET group)

SGS Canada Inc

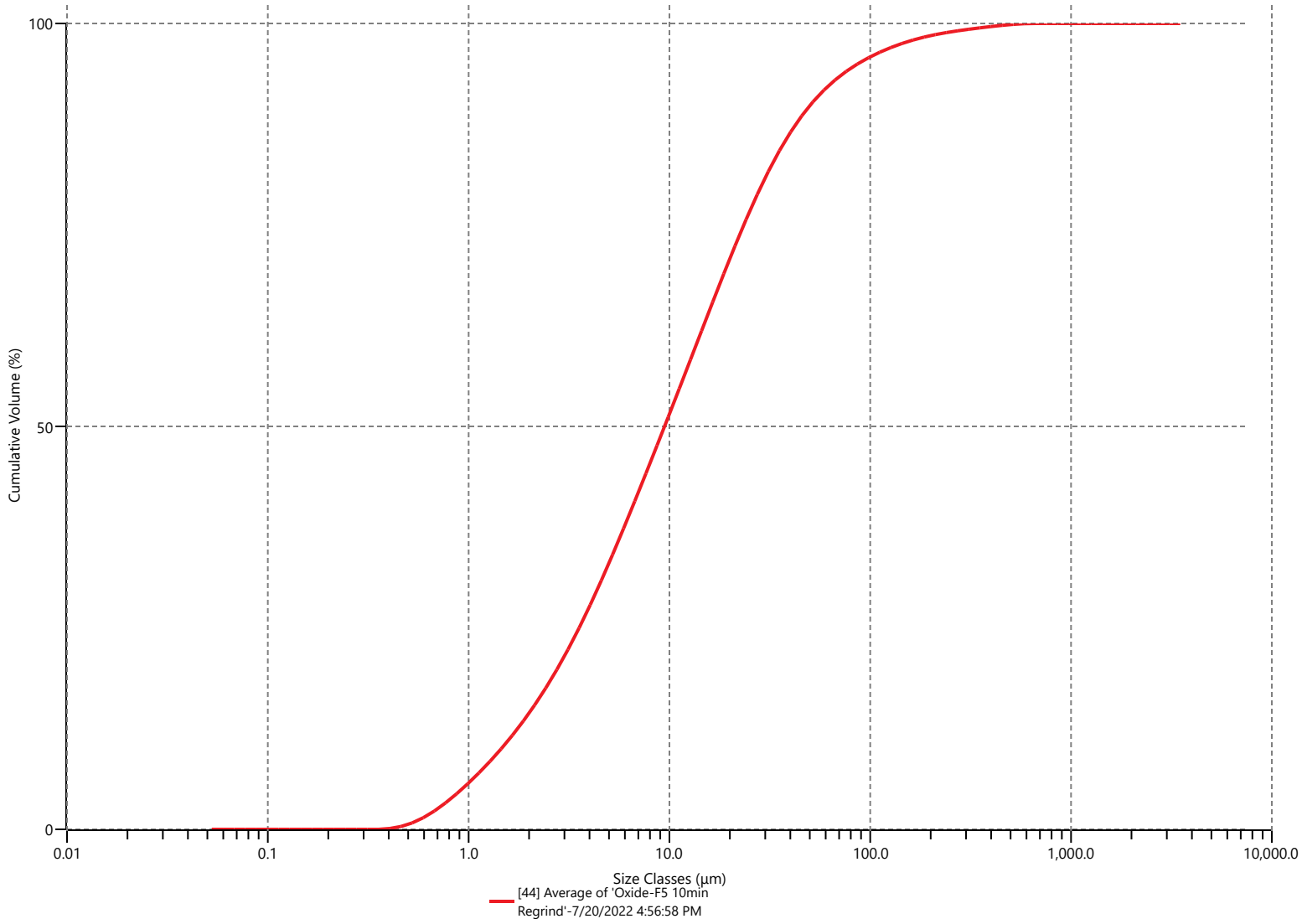
Sample Name	Average of 'Oxide-F5 10min Regrind'
SOP File Name	19248-01 Cu.msop
Dispersant Name	Water
Analysis Sensitivity	Normal

Laser Obscuration	36.56 %
Result Units	Volume
Result Source	Averaged
Dv (80)	28.9 µm

Operator Name	Max_Ahn

Measurement Date	***7/20/2022***

Undersize



Size Analysis Report (MET group)

SGS Canada Inc

Malvern

Result

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.113	0.00	1.28	1.55	14.5	3.57	163	0.37	1850	0.00
0.0114	0.00	0.128	0.00	1.45	1.67	16.4	3.52	186	0.30	2100	0.00
0.0129	0.00	0.146	0.00	1.65	1.80	18.7	3.43	211	0.25	2390	0.00
0.0147	0.00	0.166	0.00	1.88	1.95	21.2	3.29	240	0.22	2710	0.00
0.0167	0.00	0.188	0.00	2.13	2.12	24.1	3.10	272	0.19	3080	0.00
0.0189	0.00	0.214	0.00	2.42	2.30	27.4	2.86	310	0.18	3500	
0.0215	0.00	0.243	0.00	2.75	2.49	31.1	2.59	352	0.16		
0.0244	0.00	0.276	0.00	3.12	2.68	35.3	2.30	400	0.15		
0.0278	0.00	0.314	0.00	3.55	2.87	40.1	2.01	454	0.12		
0.0315	0.00	0.357	0.10	4.03	3.04	45.6	1.73	516	0.08		
0.0358	0.00	0.405	0.25	4.58	3.18	51.8	1.48	586	0.03		
0.0407	0.00	0.460	0.44	5.21	3.29	58.9	1.25	666	0.00		
0.0463	0.00	0.523	0.65	5.92	3.37	66.9	1.07	756	0.00		
0.0526	0.00	0.594	0.84	6.72	3.43	76.0	0.91	859	0.00		
0.0597	0.00	0.675	1.00	7.64	3.47	86.4	0.78	976	0.00		
0.0679	0.00	0.767	1.14	8.68	3.51	98.1	0.67	1110	0.00		
0.0771	0.00	0.872	1.25	9.86	3.55	111	0.58	1260	0.00		
0.0876	0.00	0.991	1.34	11.2	3.57	127	0.50	1430	0.00		
0.0995	0.00	1.13	1.44	12.7	3.59	144	0.43	1630	0.00		

Size Analysis Report (MET group)

SGS Canada Inc

Malvern

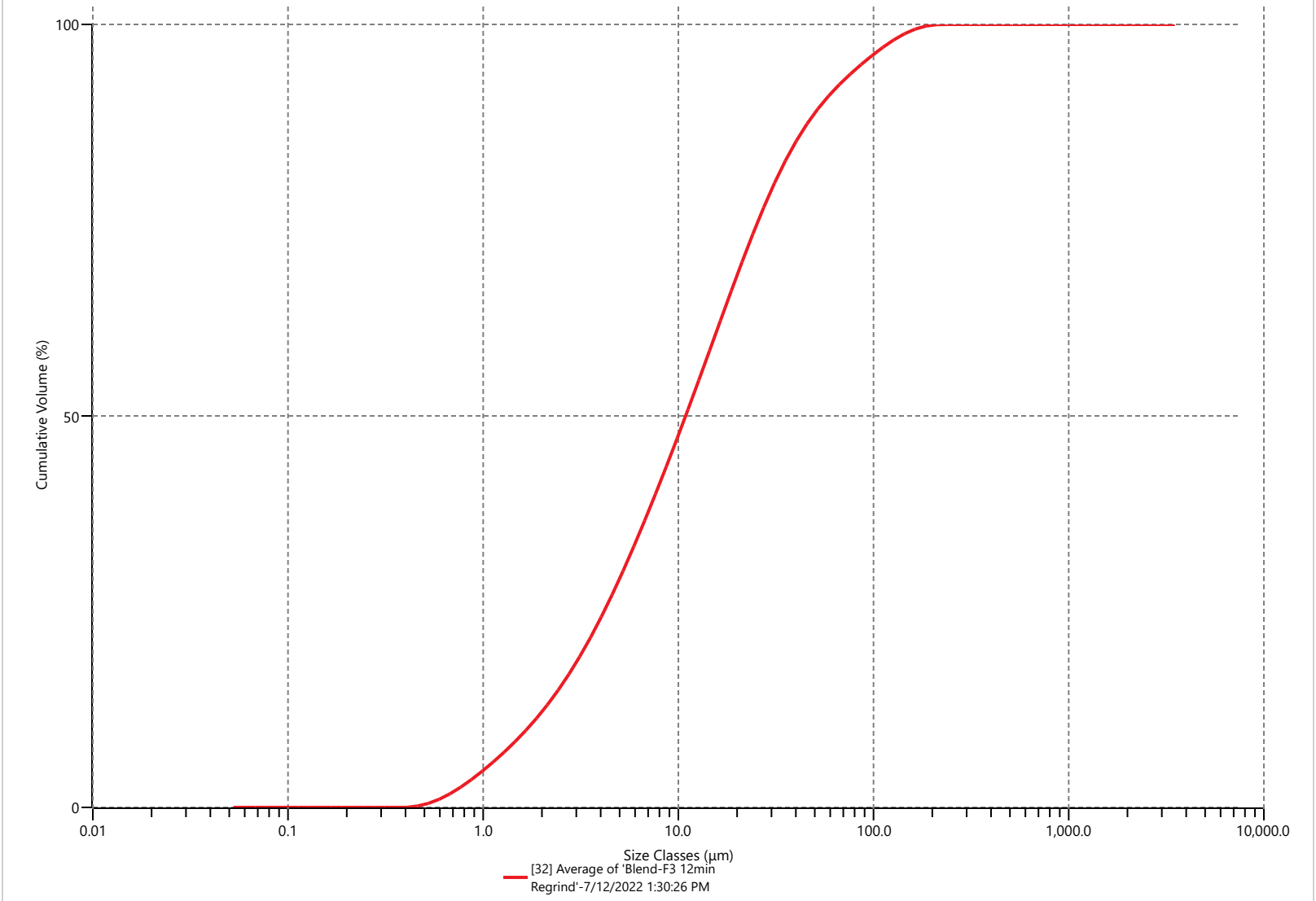
Sample Name	Average of 'Blend-F3 12min Regrind'
SOP File Name	19248-01 Cu.msop
Dispersant Name	Water
Analysis Sensitivity	Normal

Laser Obscuration	29.68 %
Result Units	Volume
Result Source	Averaged
Dv (80)	31.5 µm

Operator Name	Max_Ahn

Measurement Date	***7/12/2022***

Undersize



Size Analysis Report (MET group)

SGS Canada Inc

Malvern

Result

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.113	0.00	1.28	1.33	14.5	3.81	163	0.39	1850	0.00
0.0114	0.00	0.128	0.00	1.45	1.44	16.4	3.79	186	0.18	2100	0.00
0.0129	0.00	0.146	0.00	1.65	1.56	18.7	3.71	211	0.03	2390	0.00
0.0147	0.00	0.166	0.00	1.88	1.71	21.2	3.58	240	0.00	2710	0.00
0.0167	0.00	0.188	0.00	2.13	1.87	24.1	3.38	272	0.00	3080	0.00
0.0189	0.00	0.214	0.00	2.42	2.06	27.4	3.13	310	0.00	3500	
0.0215	0.00	0.243	0.00	2.75	2.25	31.1	2.83	352	0.00		
0.0244	0.00	0.276	0.00	3.12	2.45	35.3	2.51	400	0.00		
0.0278	0.00	0.314	0.00	3.55	2.64	40.1	2.20	454	0.00		
0.0315	0.00	0.357	0.00	4.03	2.83	45.6	1.91	516	0.00		
0.0358	0.00	0.405	0.17	4.58	3.00	51.8	1.66	586	0.00		
0.0407	0.00	0.460	0.34	5.21	3.16	58.9	1.47	666	0.00		
0.0463	0.00	0.523	0.52	5.92	3.29	66.9	1.32	756	0.00		
0.0526	0.00	0.594	0.70	6.72	3.40	76.0	1.22	859	0.00		
0.0597	0.00	0.675	0.85	7.64	3.50	86.4	1.14	976	0.00		
0.0679	0.00	0.767	0.98	8.68	3.59	98.1	1.05	1110	0.00		
0.0771	0.00	0.872	1.08	9.86	3.68	111	0.94	1260	0.00		
0.0876	0.00	0.991	1.16	11.2	3.75	127	0.79	1430	0.00		
0.0995	0.00	1.13	1.24	12.7	3.80	144	0.60	1630	0.00		

Size Analysis Report (MET group)

SGS Canada Inc

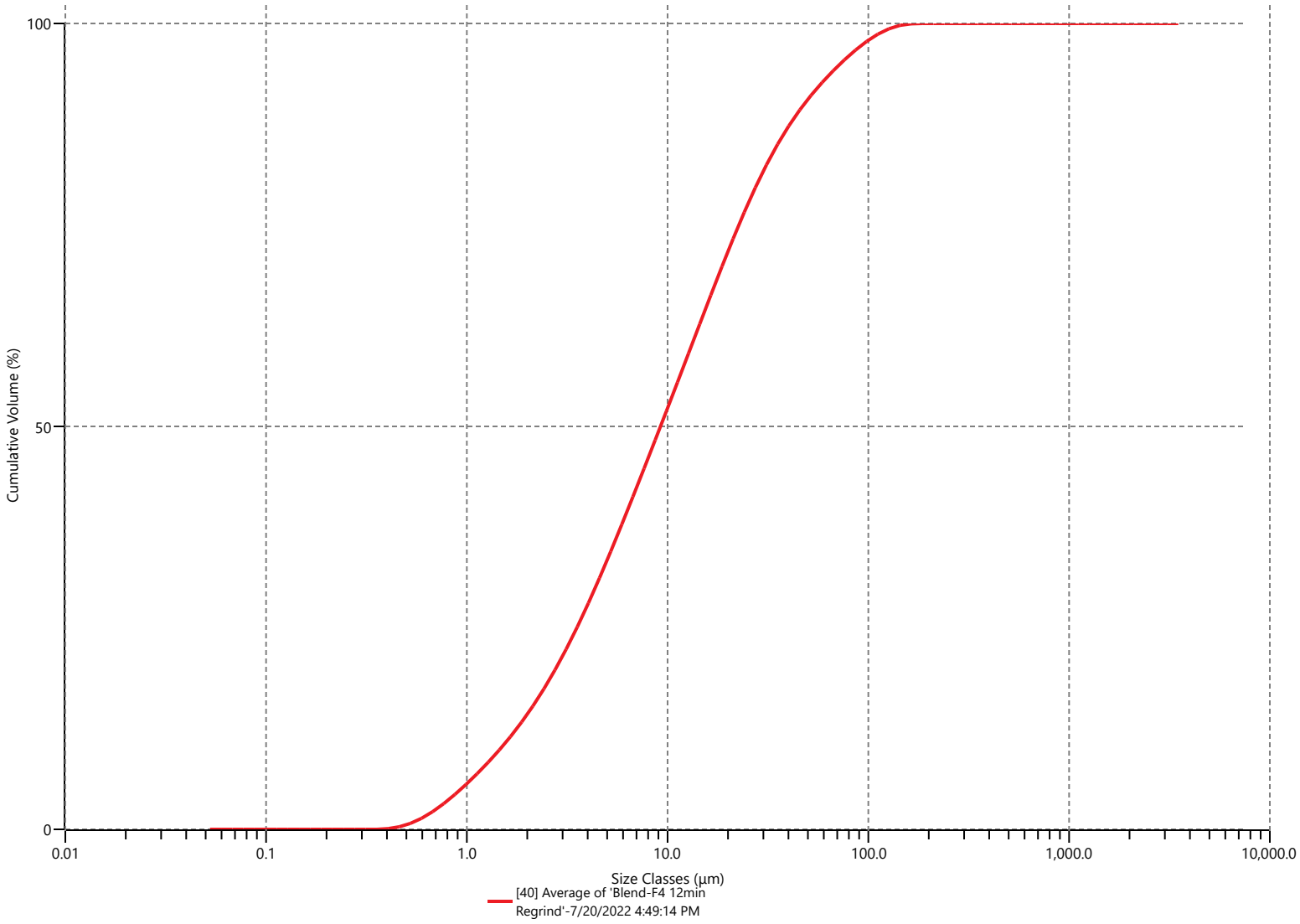
Sample Name	Average of 'Blend-F4 12min Regrind'
SOP File Name	19248-01 Cu.msop
Dispersant Name	Water
Analysis Sensitivity	Normal

Laser Obscuration	28.14 %
Result Units	Volume
Result Source	Averaged
Dv (80)	27.8 µm

Operator Name	Max_Ahn

Measurement Date	***7/20/2022***

Undersize



Size Analysis Report (MET group)

SGS Canada Inc

Malvern

Result

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.113	0.00	1.28	1.53	14.5	3.60	163	0.04	1850	0.00
0.0114	0.00	0.128	0.00	1.45	1.65	16.4	3.54	186	0.00	2100	0.00
0.0129	0.00	0.146	0.00	1.65	1.80	18.7	3.44	211	0.00	2390	0.00
0.0147	0.00	0.166	0.00	1.88	1.97	21.2	3.28	240	0.00	2710	0.00
0.0167	0.00	0.188	0.00	2.13	2.16	24.1	3.08	272	0.00	3080	0.00
0.0189	0.00	0.214	0.00	2.42	2.36	27.4	2.82	310	0.00	3500	
0.0215	0.00	0.243	0.00	2.75	2.56	31.1	2.55	352	0.00		
0.0244	0.00	0.276	0.00	3.12	2.77	35.3	2.27	400	0.00		
0.0278	0.00	0.314	0.00	3.55	2.96	40.1	2.01	454	0.00		
0.0315	0.00	0.357	0.08	4.03	3.13	45.6	1.78	516	0.00		
0.0358	0.00	0.405	0.23	4.58	3.26	51.8	1.60	586	0.00		
0.0407	0.00	0.460	0.42	5.21	3.37	58.9	1.46	666	0.00		
0.0463	0.00	0.523	0.63	5.92	3.45	66.9	1.34	756	0.00		
0.0526	0.00	0.594	0.83	6.72	3.50	76.0	1.22	859	0.00		
0.0597	0.00	0.675	1.00	7.64	3.53	86.4	1.08	976	0.00		
0.0679	0.00	0.767	1.14	8.68	3.56	98.1	0.89	1110	0.00		
0.0771	0.00	0.872	1.24	9.86	3.59	111	0.67	1260	0.00		
0.0876	0.00	0.991	1.33	11.2	3.61	127	0.43	1430	0.00		
0.0995	0.00	1.13	1.43	12.7	3.62	144	0.19	1630	0.00		

Size Analysis Report (MET group)

SGS Canada Inc

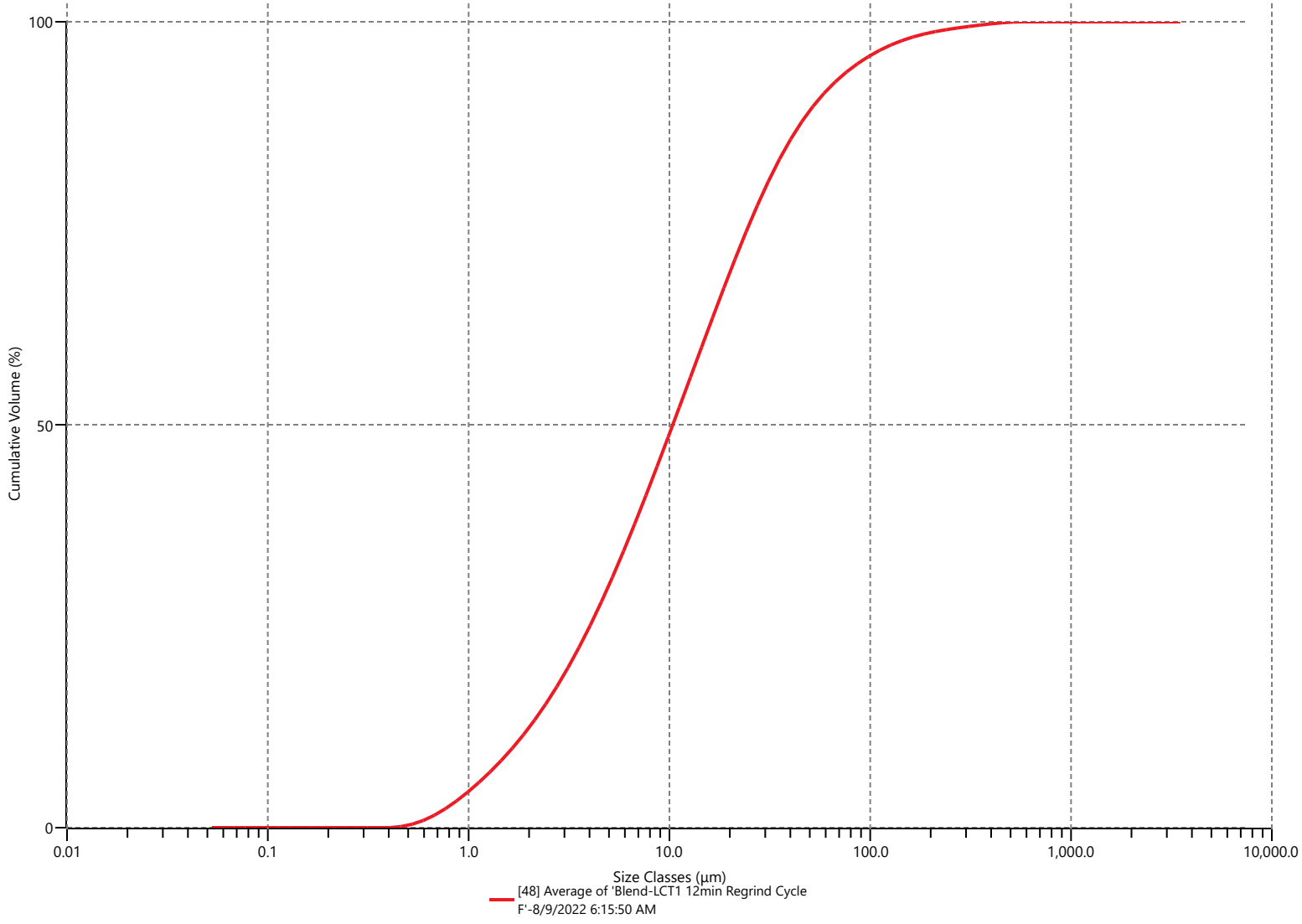
Sample Name	Average of 'Blend-LCT1 12min Regrind Cycle F'
SOP File Name	19248-01 Cu.msop
Dispersant Name	Water
Analysis Sensitivity	Normal

Laser Obscuration	24.92 %
Result Units	Volume
Result Source	Averaged
Dv (80)	30.8 µm

Operator Name	Max_Ahn

Measurement Date	***8/9/2022***

Undersize



Size Analysis Report (MET group)

SGS Canada Inc

Result

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.113	0.00	1.28	1.41	14.5	3.70	163	0.37	1850	0.00
0.0114	0.00	0.128	0.00	1.45	1.53	16.4	3.65	186	0.30	2100	0.00
0.0129	0.00	0.146	0.00	1.65	1.67	18.7	3.56	211	0.24	2390	0.00
0.0147	0.00	0.166	0.00	1.88	1.82	21.2	3.42	240	0.21	2710	0.00
0.0167	0.00	0.188	0.00	2.13	1.99	24.1	3.24	272	0.18	3080	0.00
0.0189	0.00	0.214	0.00	2.42	2.16	27.4	3.02	310	0.17	3500	
0.0215	0.00	0.243	0.00	2.75	2.35	31.1	2.75	352	0.16		
0.0244	0.00	0.276	0.00	3.12	2.54	35.3	2.47	400	0.13		
0.0278	0.00	0.314	0.00	3.55	2.72	40.1	2.18	454	0.10		
0.0315	0.00	0.357	0.00	4.03	2.91	45.6	1.90	516	0.03		
0.0358	0.00	0.405	0.14	4.58	3.08	51.8	1.64	586	0.00		
0.0407	0.00	0.460	0.29	5.21	3.24	58.9	1.41	666	0.00		
0.0463	0.00	0.523	0.47	5.92	3.38	66.9	1.21	756	0.00		
0.0526	0.00	0.594	0.65	6.72	3.50	76.0	1.04	859	0.00		
0.0597	0.00	0.675	0.82	7.64	3.59	86.4	0.90	976	0.00		
0.0679	0.00	0.767	0.97	8.68	3.65	98.1	0.77	1110	0.00		
0.0771	0.00	0.872	1.09	9.86	3.70	111	0.66	1260	0.00		
0.0876	0.00	0.991	1.20	11.2	3.72	127	0.55	1430	0.00		
0.0995	0.00	1.13	1.30	12.7	3.73	144	0.45	1630	0.00		

Memorandum

To: Granite Creek Copper

From: Rachel Martz, Kalina Malowany, Kai Woloshyn, Ensero Solutions Canada, Inc.

CC: Travis Johnnie, Tutchone Environmental Consulting

Date: February 8, 2023

Re: Environmental Monitoring 2021/2022, Carmacks Project

1 INTRODUCTION

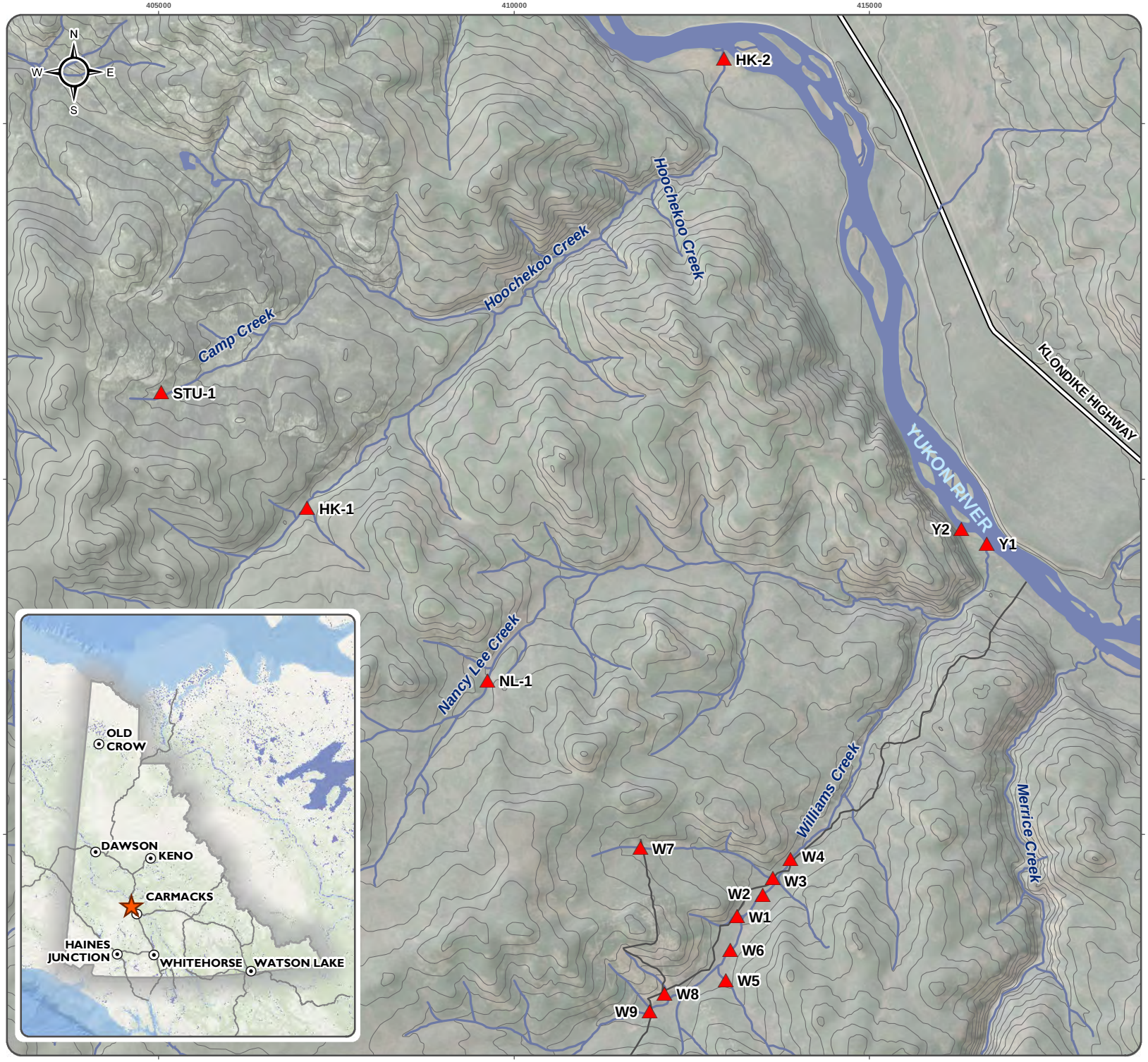
Ensero Solutions Canada, Inc. (Ensero) and Tutchone Environmental (Tutchone) have partnered up to complete surface water monitoring at the Carmacks Project on behalf of Granite Creek Copper (GCC). This memorandum describes the two surface water monitoring events completed at the Carmacks Project on June 1st, 2021, and on September 13th and 14th, 2022. The 2021 sampling event was completed by field staff from Tutchone, and the 2022 sampling event was completed by field staff from both Ensero and Tutchone. This memorandum summarizes the results from both the 2021 and 2022 monitoring events.

2 SAMPLING LOCATIONS AND SITE CONDITIONS

The Carmacks project is accessed from KM 35 on the Freegold Road, where a 14 km access road leads you to the site. Surface water data was proposed to be collected at 6 sites during the 2021 field trip, and from 9 established surface water monitoring sites along Williams Creek during the 2022 field trip. Locations for the 2021 and 2022 monitoring events are shown on Figure 2-1.

Observational records from the 2021 monitoring event were limited, and therefore only the analytical data from the 2021 sample events is presented and discussed. Samples were collected from stations Y-1 and Y-2 on the Yukon River, HK-1 and HK-2 on Hoochekoo Creek, NL-1 on Nancey Lee Creek, and STU-1 on Camp Creek. Flow measurements were not taken during this trip.

In 2022, surface water samples were successfully collected at 8 of the 9 proposed locations along Williams Creek, as location W8 could not be located. During the 2022 visit, weather was typical of Yukon in September. Temperatures ranged from 5°C overnight to 15°C during the day and some light rain was experienced during the trip. The site access road goes through some very low sections and may be very muddy in wet conditions, but during the 2022 trip the road was dry and in good condition.



GRANITE CREEK COPPER

FIGURE 2-1

SURFACE WATER QUALITY MONITORING LOCATIONS

DECEMBER 2022

- Carmacks Project Location
- Surface Water Quality Sampling Locations
- Access Trail
- Watercourse
- Waterbody
- Contours (100ft)

0 1 2 3

Kilometers

Satelite imagery obtained from ESRI ArcGIS map service https://services.arcgisonline.com/ArcGIS/rest/service on December 15 2022.

Datum: NAD 83; Map Projection: UTM Zone 8N

GRANITE CREEK COPPER

ENSERO solutions

D:\Project\AllProjects\Misc\Carmacks_Project\02-Map\02-Water_Quality\SWQ_Overview_20221215.mxd
(Last edited by: amatlashevska;2022-12-15(14:18 PM)

Stations W1, W2, W3, W4, W5 and W6 were accessed via side-by-side along a narrow road. Some walking was required to access the sites, and flagging was placed to facilitate future sampling events. W7 and W9 were both truck accessible. W8 could not be located and a search of the area found no evidence of any streambed. It is possible that the stream W8 should be on was rerouted during the construction of the historic heap-leach pad. Flow measurements were attempted at all sites, except for W5 and W8 due to insufficient flow. W9 was not measured as there was an equipment malfunction. Photos of the surface water stations W1, W3, W4, W5, and W7 are given in Appendix A.

3 METHODOLOGY

This section describes the surface water sampling and flow measurement methods that were completed at the surface water stations in 2021 and 2022.

3.1 SURFACE WATER SAMPLING

All surface water sites were visited during both field trips as intended. *In situ* field measurements were made prior to sampling at each station. Field parameters (pH, specific conductance, oxidation reduction potential [ORP], dissolved oxygen [DO], and temperature) were measured and recorded at each station using a calibrated YSI Professional Plus multimeter to assess *in situ* water chemistry. *In situ* measurements are presented along with the analytical water quality data. No *in situ* water chemistry data is available for HK-2 or W8.

Water quality samples were collected in accordance with Canadian Council of Ministers of the Environment (CCME) *Proposals for Manual for Water Quality Sampling in Canada* (CCME, 2011). Clean nitrile gloves and sample bottles provided by the analytical laboratory specific to the analyte(s) being tested were used. Dissolved metals, dissolved mercury and dissolved organic carbon (DOC) water samples were filtered using a 0.45µm filter in the field at the time of sample collection. Preservatives were added to the sample bottles for the analysis of total metals, dissolved metals, total mercury, dissolved mercury, TOC, DOC, and nutrients, as directed by the analytical laboratory (ALS Environmental [ALS]). Samples were kept in coolers with ice packs and sent to ALS, Burnaby, BC for analysis with an accompanying chain of custody form specifying the analyte(s) to be tested. Samples were analyzed from the following parameters:

- Total and Dissolved Metals;
- pH, Alkalinity, Conductivity;
- Major anions and cations;
- Hardness;
- Total phosphorous;
- Total Nitrogen, Nitrate, Nitrite, Ammonia;
- Total Suspended Solids;
- Total Dissolved Solids; and
- Total and Dissolved Organic Carbon.

3.2 HYDROMETRIC MEASUREMENTS

During the September 2022 sampling event, streamflow measurements were taken from all sites that were found to be suitable (not dry, and with enough water for sampling). Streamflow measurements were attempted at all sites except for W5, W8 and W9. W5 and W8 were not measured due to insufficient or non-existent flow, and W9 was not measured due to the YSI data space being filled from the very long salt flows at some of the other sites. No flow measurements were made during the 2021 event.

Hydrometric monitoring at the Carmacks Project was conducted as per *the Manual of British Colombia Hydrometric Standards* (RISC 2018). At each site the stream was inspected for safety, conditions and anomalies. Where possible, the discharge measurements and samples were taken from the same spot to maintain consistency of the results. Due to the small size and turbulent flow at the monitoring sites along Williams Creek, all flow measurements were conducted using the salt dilution method (RISC, 2018). Two flow measurements were conducted at each site when possible and the mean presented in Section 4.1.

3.3 ANALYTICAL DATA MANAGEMENT AND SCREENING

Upon receipt from the analytical laboratory, water quality data and *in situ* field data were imported into a dedicated EQWin database for management and screening.

The water quality data for all sites was screened against the Canadian Council of Ministers of the Environment (CCME) long term (i.e., chronic) Water Quality Guidelines (WQGs) for the Protection of Freshwater Aquatic Life (Table 3-1, CCME 2019). These guidelines have been previously applied to the surface water quality data at the site (Access Consulting, 2011), and therefore have been carried forward for screening purposes.

In addition to the CCME WQGs, Site Specific Water Quality Objective (SSWQOs) were developed for the site by Minnow Environmental Inc. (2008) and have also been included for data screening. SSWQOs were developed for sites along Williams Creek for total aluminum, total copper, total iron only. Water quality data exceeding the screening criteria is highlighted in the analytical tables for reference.

Table 3-1: Generic Long Term CCME Water Quality Guidelines for the Protection of Aquatic Life

Parameter	Guideline [1]
pH	6.5 – 9.0
Nitrate as N	3 mg/L
Nitrite as N	0.06 mg/L
Ammonia as N	0.305 – 15.8 (pH and temperature dependent)
Chloride	120 mg/L
Fluoride	0.12 mg/L
Free CN	0.005 mg/L
Metal(loid)s	
Aluminum (total)	0.005 mg/L if pH <6.5
	0.1 mg/L if pH ≥6.5
Arsenic (total)	0.005 mg/L
Boron (total)	1.5 mg/L
Cadmium (total)	[10^{0.83(log[hardness mg/L]) – 2.46}]/1000 mg/L; for hardness ≥17 mg/L and ≤280 mg/L
Chromium (total)	0.001 mg/L for hexavalent chromium
Copper (total)	0.002 mg/L if hardness <82 mg/L; [0.2 * e^{0.8545[ln(hardness mg/L)]-1.465}]/1000 mg/L if hardness ≥82 mg/L and ≤180 mg/L; 0.004 mg/L if hardness >180 mg/L
Iron (total)	0.3 mg/L
Lead (total)	0.001 mg/L if hardness ≤60 mg/L; [e^{1.273[ln(hardness mg/L)]-4.705}]/1000 mg/L if hardness >60 mg/L and ≤180 mg/L; 0.007 mg/L if hardness >180 mg/L
Manganese (dissolved)	Online CCME calculator that is hardness and pH dependent for hardness ≥ 10 mg/L and ≤ 670 mg/L, and pH 5.4 — 9.0
Mercury (total)	0.000026 mg/L
Molybdenum (total)	0.073 mg/L
Nickel (total)	0.025 mg/L if hardness (as $CaCO_3$) ≤ 60 mg/L or unknown; (e^{0.76[ln(hardness)]+1.06})/1000 (mg/L) if hardness >60 mg/L and ≤180 mg/L, 0.15 mg/L if hardness >180 mg/L
Selenium (total)	0.001 mg/L
Silver (total)	0.00025 mg/L
Thallium (total)	0.0008 mg/L
Uranium (total)	0.015 mg/L
Zinc (dissolved)	0.011 - 0.10 hardness, pH and DOC dependent

[1] Where the measured hardness, pH, or dissolved organic carbon (DOC) concentrations exceed the stated range for which the water quality guideline is valid (CCME 2019), the uppermost or lowermost extent of the guideline range was used.

3.4 QUALITY ASSURANCE QUALITY CONTROL (QA/QC)

QA/QC samples were collected or prepared as follows:

- Field duplicates – A field duplicate is an additional sample collected at the same date, time, and location as the regular sample. This confirms accuracy and precision of the external laboratory analysis and variability in water quality. In 2022, a duplicate sample for all the analytes was collected at W7 and labeled "DUP".

- Field blank - Sample bottles filled on site with deionized water using the same sampling method to sample the regular sample. This determines contamination introduced through the method and supplies used. A field blank was collected in 2022 at W9 and labelled "FB".

- Trip blank – A trip blanks was provided by the laboratory to be carried by field staff while remaining unopened. This helps to identify contamination arising during transport and storage. A trip blank was carried by field staff during the 2021 trip which was labelled "Trip Blank", and on the 2022 field trip which was labelled "TB".

Upon receipt from the laboratory, the internal QA/QC testing performed by the laboratory (i.e., method blanks, analytical replicates, matrix and blank spikes) was inspected to confirm it meets the laboratory standards for reporting. Duplicate sample data was compared by calculating the relative percent difference (RPD) as shown below.

$$\%RPD = \left(\frac{x_1 - x_2}{\frac{1}{2}(x_1 + x_2)} \right) x\ 100$$

RPD was used to determine field variability. Where analyte results had RPD greater than 25% a subsequent check was completed against the laboratory detection limit (DL) to establish if the concentrations in both the duplicate and parent sample met the practical quantitation limit (PQL) The PQL is five times the DL and is defined as the minimum concentration that can be measured within specified limits of precision and accuracy. Both results need to be above the PQL for the analyte to be considered as 'meeting the PQL'. If one result from the sample or duplicate was greater than five times the DL and the other result was less than five times the DL then the 'PQL is not met'. An analyte with results not meeting the PQL indicates that the constituent analyzed was not present at a high enough concentration to be reliably quantified. Typically, as parameters approach their DL, high variability is more likely to occur. The RPD of 25% was used as a benchmark whereby an RPD greater than 25% warranted further comment or consideration.

4 RESULTS

4.1 SURFACE WATER FIELD DATA

The *in situ* surface water quality data and surface water discharge field measurements are presented in Table 4-1 and Table 4-2.

Table 4-1: 2021 *In situ* Surface Water Quality Data and Discharge Measurements

Site	Date	Temperature (°C)	Dissolved oxygen (%)	Sp. Cond. (µS/cm)	pH	ORP (mV)	TDS (ppm)	Turbidity (NTU)
NL-1	01-Jun-21	3.81	13.4	0	7.77	122.8	0	6.16
HK-1	01-Jun-21	4.93	13.5	212	7.82	140.9	106	19.5
HK-2[1]	01-Jun-21	-	-	-	-	-	-	-
STU-1	01-Jun-21	1.28	13.5	130	7.59	112.6	65	21.3
Y-1	01-Jun-21	4.90	13.2	182	7.90	166.3	93	58.9
Y-2	01-Jun-21	7.95	13.1	184	7.86	137.4	92	38.7

[1]HK-2 was not sampled due to being dry.

Table 4-2: 2022 *In situ* Surface Water Quality Data and Discharge Measurements

Site	Date	Temperature (°C)	Dissolved oxygen (%)	Dissolved Oxygen (mg/L)	Sp. Cond. (µS/cm)	pH	ORP (mV)	Discharge (m^3/sec)
W1	13-Sep-22	2.0	71.2	9.88	437.9	9.04	-42.0	0.0040
W2	13-Sep-22	2.9	92.7	12.51	281.2	8.17	-22.5	0.0555
W3	13-Sep-22	4.0	52.3	6.88	332.8	8.12	-56.1	0.0091
W4	13-Sep-22	2.7	105.4	14.20	279.4	8.15	66.5	0.0702
W5	14-Sep-22	2.8	45.5	6.08	202.1	7.48	-59.2	-
W6	13-Sep-22	3.3	93.7	12.49	281.3	8.25	-24.7	0.0502
W7	14-Sep-22	3.3	80.1	10.66	261.0	7.85	-45.0	0.0036
W8	14-Sep-22	Station not located.						
W9	14-Sep-22	3.9	79.2	10.53	297.0	8.05	-24.9	-

4.2 SURFACE WATER ANALYTICAL DATA

Water quality analytical results from the 2021 and 2022 sampling events are presented in Table 4-3 and Table 4-4, with comparison to application guidelines. The sampling events returned some parameters that exceeded CCME guidelines, SSWQO, or both. Lab results can be found in Appendix B.

Results from 2021 sampling event revealed, total aluminum, copper, and iron exceeded either the CCME or SSWQO guidelines at all sies except NL-1. Fluoride exceeded the CCME guideline at Y1, HK-2, and STU-1, and total chromium exceeded the CCME guideline at Y1 and Y2. Lastly, dissolved copper and zinc exceeded the CCME guideline at Y1 and NL-1, respectively.

Results from the 2022 sampling event revealed that the field pH and dissolved oxygen were slightly above CCME guidelines at W1 and W5, respectively. Fluoride exceeded the CCME guideline for all stations sampled in 2022, and total aluminum exceeded the CCME guideline at W2, W4, and W6. Total copper exceeded the CCME guideline at W5 and W7. Total iron exceeded the SSWQO at W5, and the CCME guideline at W2, W4, and W6, and dissolved iron exceeded the CCME guideline at W2 and W5.

Table 4-3: June 2021 Surface Water Quality Results

Parameter	Units	CCME PAL Long Term	SSWQO	Y1	Y2	HK-1	HK-2	NL-1	STU-1
				01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021
Total Dissolved Solids (lab)	mg/L	-	-	157	115	155	165	117	116
Total Suspended Solids	mg/L	-	-	62	64	22	12	4.8	75
pH (lab)	pH units	6.5-9	-	7.61	7.72	7.86	7.92	7.52	7.48
Specific Conductance (lab)	µS/cm	-	-	165	171	198	216	112	121
Turbidity (lab)	NTU	-	-	19	17	9.4	6.3	1.1	8.1
Hardness (from total)	mg/L	-	-	88.3	87.8	87.5	97.5	58.7	62.8
Hardness (from dissolved)	mg/L	-	-	75.9	73.6	81.9	91.9	55.9	55.8
Total Acidity	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acidity (pH 4.5)	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total	mg/L	-	-	68.4	72.1	98.7	103	52.6	54.8
Alkalinity, bicarbonate HCO3	mg/L	-	-	83.5	88	120	126	64.1	66.8
Alkalinity, hydroxide OH	mg/L	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alkalinity, carbonate CO3	mg/L	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alkalinity, PP carbonate CO3	mg/L	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloride	mg/L	120	-	1.1	<0.50	0.66	0.88	0.7	<0.50
Fluoride	mg/L	0.12	-	**0.18**	0.12	0.12	**0.18**	0.089	**0.13**
Sulphate, dissolved	mg/L	-	-	0.9	14	<0.50	<0.50	<0.50	<0.50
Cyanide, total	mg/L	-	-	0.00151	0.00054	0.00117	0.00114	0.00131	0.00109
Ammonia (N)	mg/L	*	-	0.011	<0.0050	0.0055	0.015	0.0093	0.012
Nitrite (N)	mg/L	0.06	-	<0.020	<0.0020	<0.020	<0.020	<0.020	<0.020
Nitrate (N)	mg/L	3.0	-	0.038	0.0305	<0.020	<0.020	<0.020	<0.020
Nitrogen, Total	mg/L	-	-	0.844	0.303	0.581	0.628	0.678	0.616
Nitrite & Nitrate, as N	mg/L	-	-	0.038	0.0305	<0.020	<0.020	<0.020	<0.020
Total Kjeldahl Nitrogen	mg/L	-	-	0.806	0.272	0.581	0.628	0.678	0.616
Phosphorus,total-colourimetric	mg/L	-	-	0.057	0.046	0.022	0.024	0.0074	0.056
Total Organic Carbon	mg/L	-	-	31	6.8	18	20	27	16
Aluminum (Al), total	mg/L	*	0.66	**1.31**	**1.09**	**0.388**	**0.35**	0.0891	**0.716**
Antimony (Sb), total	mg/L	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Parameter	Units	CCME PAL Long Term	SSWQO	Y1	Y2	HK-1	HK-2	NL-1	STU-1
				01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021
Arsenic (As), total	mg/L	0.005	-	0.00104	0.00111	0.00064	0.00061	0.0004	0.00052
Barium (Ba), total	mg/L	-	-	0.0554	0.0545	0.0613	0.052	0.0203	0.0495
Beryllium (Be), total	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi), total	mg/L	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B), total	mg/L	1.5	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd), total	mg/L	*	-	0.000041	0.000031	<0.000010	<0.000010	<0.000010	0.000038
Calcium (Ca), total	mg/L	-	-	25.7	24.5	21.9	25.1	18	19.7
Chromium (Cr), total	mg/L	0.001	-	**0.0023**	**0.0022**	<0.0010	<0.0010	<0.0010	0.001
Cobalt (Co), total	mg/L	-	-	0.00088	0.00081	0.00024	0.00024	<0.00020	0.00046
Copper (Cu), total	mg/L	*	*	**0.00527**	**0.00337**	**0.00231**	**0.00258**	0.00197	**0.00281**
Iron (Fe), total	mg/L	0.3	1.1	**2.04**	**1.74**	**0.677**	**0.564**	0.256	**1.16**
Lead (Pb), total	mg/L	*	-	0.00092	0.00061	<0.00020	<0.00020	<0.00020	0.00035
Lithium (Li), total	mg/L	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Magnesium (Mg), total	mg/L	-	-	5.85	6.46	7.98	8.44	3.37	3.29
Manganese (Mn), total	mg/L	-	-	0.0598	0.0525	0.0277	0.0308	0.0123	0.0342
Mercury (Hg), total	mg/L	0.000026	-	0.000004	<0.0000019	0.0000029	0.0000023	0.0000052	0.000003
Molybdenum (Mo), total	mg/L	0.073	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni), total	mg/L	*	-	0.0032	0.003	0.0011	0.0012	<0.0010	0.0012
Phosphorus (P), total	mg/L	-	-	0.062	0.063	0.029	0.027	<0.01	0.047
Potassium (K), total	mg/L	-	-	0.869	1.03	0.82	0.907	0.353	0.678
Selenium (Se), total	mg/L	0.001	-	0.0001	0.00017	<0.00010	<0.00010	<0.00010	<0.00010
Silicon (Si), total	mg/L	-	-	8.14	5.57	6.07	5.99	5.23	6.71
Silver (Ag), total	mg/L	0.00025	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na), total	mg/L	-	-	4.61	2.49	10.1	8.68	3.46	2.73
Strontium (Sr), total	mg/L	-	-	0.193	0.134	0.233	0.256	0.0918	0.104
Sulphur (S), total	mg/L	-	-	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Thallium (Tl), total	mg/L	0.0008	-	0.000014	0.000013	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn), total	mg/L	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Titanium (Ti), total	mg/L	-	-	0.0432	0.0471	0.0141	0.0127	<0.0050	0.0298

Parameter	Units	CCME PAL Long Term	SSWQO	Y1	Y2	HK-1	HK-2	NL-1	STU-1
				01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021
Uranium (U), total	mg/L	0.015	-	0.00036	0.0009	0.0004	0.00047	<0.00010	<0.00010
Vanadium (V), total	mg/L	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zinc (Zn), total	mg/L	-	-	0.0077	0.0058	<0.0050	<0.0050	<0.0050	0.0071
Zirconium (Zr), total	mg/L	-	-	0.00061	0.00025	0.00041	0.00036	0.0003	0.00027
Aluminum (Al), dissolved	mg/L	*	-	0.0322	0.0125	0.0232	0.0227	0.0553	0.0272
Antimony (Sb), dissolved	mg/L	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As), dissolved	mg/L	0.005	-	0.00047	0.00044	0.00051	0.00052	0.00038	0.00031
Barium (Ba), dissolved	mg/L	-	-	0.0254	0.0298	0.0521	0.0426	0.0181	0.0323
Beryllium (Be), dissolved	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi), dissolved	mg/L	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B), dissolved	mg/L	1.5	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd), dissolved	mg/L	*	-	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (Ca), dissolved	mg/L	-	-	22.4	20.8	20.4	23.8	17.1	17.4
Chromium (Cr), dissolved	mg/L	0.001	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co), dissolved	mg/L	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Copper (Cu), dissolved	mg/L	*	-	**0.00234**	0.00107	0.0017	0.00191	0.00188	0.00141
Iron (Fe), dissolved	mg/L	0.3	-	0.157	0.0506	0.182	0.125	0.186	0.123
Lead (Pb), dissolved	mg/L	*	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium (Li), dissolved	mg/L	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Magnesium (Mg), dissolved	mg/L	-	-	4.84	5.27	7.52	7.9	3.2	2.97
Manganese (Mn), dissolved	mg/L	*	-	0.0029	0.0045	0.0051	0.0056	0.0075	0.0178
Mercury (Hg), dissolved	mg/L	0.000026	-	0.0000042	<0.0000019	0.0000035	0.0000032	0.0000042	0.0000028
Molybdenum (Mo), dissolved	mg/L	0.073	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni), dissolved	mg/L	*	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Orthophosphate (P)	mg/L	-	-	0.004	0.0013	0.004	0.0039	0.002	0.0018
Selenium (Se), dissolved	mg/L	0.001	-	<0.00010	0.00015	<0.00010	<0.00010	<0.00010	<0.00010
Potassium (K), dissolved	mg/L	-	-	0.546	0.722	0.7	0.789	0.355	0.544
Silicon (Si), dissolved	mg/L	-	-	5.49	3.3	4.89	5.08	4.9	5.14
Silver (Ag), dissolved	mg/L	0.00025	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

Parameter	Units	CCME PAL Long Term	SSWQO	Y1	Y2	HK-1	HK-2	NL-1	STU-1
				01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021	01-Jun-2021
Sodium (Na), dissolved	mg/L	-	-	4.19	2.17	9.56	8.14	3.23	2.6
Strontium (Sr), dissolved	mg/L	-	-	0.174	0.114	0.215	0.24	0.0849	0.0964
Sulphur (S), dissolved	mg/L	-	-	3.2	3.8	<3.0	<3.0	<3.0	<3.0
Thallium (Tl), dissolved	mg/L	0.0008	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn), dissolved	mg/L	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Titanium (Ti), dissolved	mg/L	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Uranium (U), dissolved	mg/L	0.015	-	0.00025	0.00076	0.00036	0.00043	<0.00010	<0.00010
Vanadium (V), dissolved	mg/L	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zinc (Zn), dissolved	mg/L	*	-	<0.0050	<0.0050	<0.0050	<0.0050	**0.0115**	<0.0050
Zirconium (Zr), dissolved	mg/L	-	-	0.00038	0.0001	0.00037	0.00035	0.00034	0.00025

Red text is exceedance of Canadian Council of Ministers of the Environment guidelines for Protection of Aquatic Life, long term (CCME).
Blue text is exceedance of Site-specific Water Quality Objective (SSWQO) developed by Minnow Environmental Inc (2008).
* = pH, hardness, and/or DOC dependant guideline.

Table 4-4: September 2022 Surface Water Quality Results

Parameter	Units	CCME PAL Long Term	SSWQO	W1	W2	W3	W4	W5	W6	W7	W9
				13-Sep-2022	13-Sep-2022	13-Sep-2022	13-Sep-2022	14-Sep-2022	13-Sep-2022	14-Sep-2022	14-Sep-2022
Discharge (Flow)	L/s	-	-	4.0	55.5	9.1	70.2	-	50.2	3.6	-
Discharge RPD	%	-	-	38.2	-	13.5	-	-	5.1	8.5	-
Total Dissolved Solids (lab)	mg/L	-	-	306	219	249	220	158	217	200	218
Total Suspended Solids	mg/L	-	-	<1.0	22.0	8.2	13.6	6.4	45.0	2.4	<1.0
pH (field)	pH units	6.5-9	-	**9.04**	8.17	8.12	8.15	7.48	8.25	7.85	8.05
pH (lab)	pH units	6.5-9	-	8.14	8.16	8.07	8.18	7.71	8.17	8.03	8.20
Specific Conductance (field)	µS/cm	-	-	437.9	281.2	332.8	279.4	202.1	281.3	261.0	297
Specific Conductance (lab)	µS/cm	-	-	421	277	315	270	168	273	239	288
Temperature (field)	C	-	-	2.0	2.9	4.0	2.7	2.8	3.3	3.3	3.9
Dissolved Oxygen (field)	mg/L	6.5	-	9.88	12.51	6.88	14.20	**6.08**	12.49	10.66	10.53
Dissolved Oxygen (field)	%	-	-	71.2	92.7	52.3	105.4	45.5	93.7	80.1	79.2
ORP (field)	mV	-	-	-42.0	-22.5	-56.1	66.5	-59.2	-24.7	-45.0	-24.9
Hardness (from total)	mg/L	-	-	212	138	172	137	88.5	137	126	143
Hardness (from dissolved)	mg/L	-	-	207	135	165	138	83.2	134	124	137
Alkalinity, total	mg/L	-	-	135	115	151	120	81.4	118	111	136
Alkalinity, bicarbonate HCO3	mg/L	-	-	135	115	151	120	81.4	118	111	136
Alkalinity, hydroxide OH	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, carbonate CO3	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, PP carbonate CO3	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromide	mg/L	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	mg/L	120	-	2.06	1.25	0.79	0.74	<0.50	0.84	<0.50	0.58
Fluoride	mg/L	0.12	-	**0.684**	**0.261**	**0.189**	**0.243**	**0.128**	**0.254**	**0.204**	**0.244**
Sulphate, dissolved	mg/L	-	-	90.5	27.9	18.2	25.0	6.43	27.6	14.8	18.3
Ammonia (N)	mg/L	*	-	<0.0050	0.0130	0.0057	0.0145	0.0086	0.0281	0.0137	0.0099
Nitrite (N)	mg/L	0.06	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010
Nitrate (N)	mg/L	3.0	-	0.235	0.0185	0.0086	0.0150	<0.0050	0.0167	<0.0050	<0.0050
Dissolved Organic Carbon	mg/L	-	-	3.67	17.0	17.1	18.2	23.5	17.5	22.0	16.6
Total Organic Carbon	mg/L	-	-	3.20	17.5	16.6	20.0	23.6	19.0	21.4	15.8

Parameter	Units	CCME PAL Long Term	SSWQO	W1	W2	W3	W4	W5	W6	W7	W9
				13-Sep-2022	13-Sep-2022	13-Sep-2022	13-Sep-2022	14-Sep-2022	13-Sep-2022	14-Sep-2022	14-Sep-2022
Aluminum (Al), total	mg/L	*	0.66	0.0039	**0.192**	0.0981	**0.142**	0.0468	**0.208**	0.0518	0.0178
Antimony (Sb), total	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	0.00024	<0.00010	<0.00010	<0.00010
Arsenic (As), total	mg/L	0.005	-	<0.00010	0.00069	0.00055	0.00064	0.00220	0.00071	0.00048	0.00052
Barium (Ba), total	mg/L	-	-	0.0592	0.0433	0.0515	0.0427	0.0386	0.0439	0.0458	0.0431
Beryllium (Be), total	mg/L	-	-	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth (Bi), total	mg/L	-	-	<0.000050	<0.000050	<0.000050	0.000095	0.000354	<0.000050	0.000676	<0.000050
Boron (B), total	mg/L	1.5	-	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd), total	mg/L	*	-	<0.0000100	0.0000072	0.0000074	0.0000093	0.0000085	0.0000076	0.0000393	0.0000050
Calcium (Ca), total	mg/L	-	-	63.1	38.5	54.0	38.8	26.0	38.0	38.4	38.6
Chromium (Cr), total	mg/L	0.001	-	<0.00050	0.00058	<0.00050	<0.00050	0.00060	0.00051	<0.00050	<0.00050
Cobalt (Co), total	mg/L	-	-	<0.00010	0.00020	0.00012	0.00020	0.00018	0.00020	0.00013	<0.00010
Copper (Cu), total	mg/L	*	*	<0.00050	0.00139	0.00159	0.00184	**0.00242**	0.00151	**0.00453**	0.00104
Iron (Fe), total	mg/L	0.3	1.1	<0.010	**0.559**	0.282	**0.453**	**4.68**	**0.512**	0.218	0.210
Lead (Pb), total	mg/L	*	-	<0.000050	0.000064	<0.000050	0.000069	0.000126	0.000074	0.000063	<0.000050
Lithium (Li), total	mg/L	-	-	<0.0010	0.0011	0.0011	0.0011	<0.0010	0.0011	<0.0010	0.0015
Magnesium (Mg), total	mg/L	-	-	13.3	10.2	9.10	9.68	5.73	10.3	7.33	11.4
Manganese (Mn), total	mg/L	-	-	0.00037	0.0491	0.123	0.0432	0.0961	0.0442	0.0340	0.0132
Mercury (Hg), total	mg/L	0.000026	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo), total	mg/L	0.073	-	0.0221	0.00242	0.00117	0.00209	0.000195	0.00196	0.00116	0.000427
Nickel (Ni), total	mg/L	*	-	<0.00050	0.00086	0.00075	0.00095	0.00143	0.00080	0.00098	0.00058
Phosphorus (P), total	mg/L	-	-	<0.050	<0.050	<0.050	<0.050	0.110	<0.050	<0.050	<0.050
Potassium (K), total	mg/L	-	-	1.09	0.636	0.538	0.633	0.462	0.702	0.348	0.727
Selenium (Se), total	mg/L	0.001	-	0.000231	0.000093	0.000091	0.000116	0.000082	0.000105	0.000127	0.000053
Silicon (Si), total	mg/L	-	-	6.44	8.84	8.50	8.65	10.3	8.44	9.10	7.86
Silver (Ag), total	mg/L	0.00025	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na), total	mg/L	-	-	9.36	9.66	6.99	9.03	5.89	10.1	6.84	11.8
Strontium (Sr), total	mg/L	-	-	0.752	0.339	0.459	0.332	0.157	0.334	0.177	0.365
Sulphur (S), total	mg/L	-	-	30.8	9.61	6.18	8.60	2.10	8.60	5.03	6.16
Thallium (Tl), total	mg/L	0.0008	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Parameter	Units	CCME PAL Long Term	SSWQO	W1	W2	W3	W4	W5	W6	W7	W9
				13-Sep-2022	13-Sep-2022	13-Sep-2022	13-Sep-2022	14-Sep-2022	13-Sep-2022	14-Sep-2022	14-Sep-2022
Tin (Sn), total	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti), total	mg/L	-	-	<0.00030	0.00770	0.00392	0.00593	0.00163	0.00916	0.00306	0.00078
Uranium (U), total	mg/L	0.015	-	0.000870	0.000418	0.000240	0.000371	0.000032	0.000446	0.000076	0.000616
Vanadium (V), total	mg/L	-	-	0.00124	0.00158	0.00110	0.00142	0.00116	0.00162	0.00078	0.00060
Zinc (Zn), total	mg/L	-	-	<0.0030	<0.0030	<0.0030	<0.0030	0.0074	<0.0030	0.0044	<0.0030
Zirconium (Zr), total	mg/L	-	-	<0.00020	0.00029	0.00022	0.00032	0.00045	0.00026	0.00028	0.00024
Aluminum (Al), dissolved	mg/L	*	-	0.0020	0.0415	0.0097	0.0294	0.0360	0.0202	0.0236	0.0255
Antimony (Sb), dissolved	mg/L	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As), dissolved	mg/L	0.005	-	0.00015	0.00068	0.00053	0.00063	0.00079	0.00070	0.00051	0.00060
Barium (Ba), dissolved	mg/L	-	-	0.0646	0.0429	0.0494	0.0422	0.0261	0.0417	0.0449	0.0431
Beryllium (Be), dissolved	mg/L	-	-	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth (Bi), dissolved	mg/L	-	-	<0.000050	0.000348	0.000082	0.000374	0.000211	<0.000050	0.000088	0.000169
Boron (B), dissolved	mg/L	1.5	-	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd), dissolved	mg/L	*	-	<0.0000050	0.0000067	<0.0000050	0.0000092	0.0000236	<0.0000050	0.0000060	<0.0000050
Calcium (Ca), dissolved	mg/L	-	-	61.0	37.0	51.3	39.1	23.7	36.7	37.5	35.4
Chromium (Cr), dissolved	mg/L	0.001	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00065	<0.00050	<0.00050
Cobalt (Co), dissolved	mg/L	-	-	<0.00010	0.00013	<0.00010	0.00015	0.00018	0.00012	0.00010	<0.00010
Copper (Cu), dissolved	mg/L	*	-	0.00023	0.00199	0.00171	0.00245	0.00190	0.00126	0.00139	0.00091
Iron (Fe), dissolved	mg/L	0.3	-	<0.010	**0.323**	0.086	0.265	**1.31**	0.274	0.152	0.218
Lead (Pb), dissolved	mg/L	*	-	<0.000050	<0.000050	<0.000050	0.000076	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li), dissolved	mg/L	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0015
Magnesium (Mg), dissolved	mg/L	-	-	13.4	10.4	9.01	9.92	5.83	10.2	7.26	11.8
Manganese (Mn), dissolved	mg/L	-	-	0.00031	0.0418	0.0547	0.0358	0.122	0.0502	0.0260	0.0121
Mercury (Hg), dissolved	mg/L	0.000026	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo), dissolved	mg/L	0.073	-	0.0214	0.00233	0.00112	0.00201	0.000137	0.00191	0.00115	0.000404
Nickel (Ni), dissolved	mg/L	*	-	<0.00050	0.00092	0.00078	0.00106	0.00110	0.00080	0.00097	0.00065
Phosphorus (P), dissolved	mg/L	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Orthophosphate (P)	mg/L	-	-	-	-	-	-	-	-	-	-
Selenium (Se), dissolved	mg/L	0.001	-	0.000156	0.000057	0.000068	0.000087	0.000052	0.000095	0.000093	0.000078

Parameter	Units	CCME PAL Long Term	SSWQO	W1	W2	W3	W4	W5	W6	W7	W9
				13-Sep-2022	13-Sep-2022	13-Sep-2022	13-Sep-2022	14-Sep-2022	13-Sep-2022	14-Sep-2022	14-Sep-2022
Potassium (K), dissolved	mg/L	-	-	1.26	0.868	0.629	0.838	0.357	0.753	0.272	0.741
Silicon (Si), dissolved	mg/L	-	-	6.20	8.35	8.18	8.28	9.99	8.06	9.03	7.47
Silver (Ag), dissolved	mg/L	0.00025	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na), dissolved	mg/L	-	-	9.62	9.92	6.90	9.27	5.71	10.0	6.51	11.2
Strontium (Sr), dissolved	mg/L	-	-	0.734	0.334	0.444	0.329	0.140	0.318	0.170	0.337
Sulphur (S), dissolved	mg/L	-	-	27.8	8.92	5.93	7.81	2.57	8.76	4.84	6.29
Thallium (Tl), dissolved	mg/L	0.0008	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn), dissolved	mg/L	-	-	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti), dissolved	mg/L	-	-	<0.00030	0.00158	0.00040	0.00086	0.00089	0.00074	0.00071	0.00049
Uranium (U), dissolved	mg/L	0.015	-	0.000891	0.000426	0.000243	0.000381	0.000026	0.000423	0.000074	0.000621
Vanadium (V), dissolved	mg/L	-	-	0.00120	0.00101	0.00065	0.00100	0.00056	0.00085	0.00058	0.00053
Zinc (Zn), dissolved	mg/L	*	-	<0.0010	0.0022	0.0010	0.0046	0.0018	<0.0010	0.0013	<0.0010
Zirconium (Zr), dissolved	mg/L	-	-	<0.00030	0.00030	<0.00030	0.00033	0.00039	<0.00030	<0.00030	<0.00030

Red text is exceedance of Canadian Council of Ministers of the Environment guidelines for Protection of Aquatic Life, long term (CCME).
Blue text is exceedance of Site-specific Water Quality Objective (SSWQO) developed by Minnow Environmental Inc (2008).
* = pH, hardness, and/or DOC dependant guideline.

4.2.1 Quality Assurance and Quality Control (QA/QC)

The results for the field blanks and trip blanks are given in Table 4-5, and duplicates are given in Table 4-6. For field and trip blanks, only results that were two-times the RDL, are included in the table. For duplicates, only results that had an RPD above 25% are included in the table. Aside from the sampling QA/QC, ALS conducts internal QA/QC programs to ensure that the results are error free and of adequate accuracy. The laboratory QA/QC included: laboratory control sample (LCS), matrix spikes (MS), method blanks (MB) and calculation of ions balance. The laboratory QA/QC program results are provided in Appendix B.

Table 4-5: Field and Trip Blank Results – Analytes Detected above Twice the RDL

Station	Date	Parameter Name	Units	Result	RDL
Trip Blank	2021-06-02	Ammonia, total	mg/L	0.013	0.0050
Trip Blank	2022-09-12	Aluminum, total	mg/L	0.0167	0.0030
Trip Blank	2022-09-12	Barium, total	mg/L	0.00054	0.00010
Field Blank	2022-09-14	Barium, dissolved	mg/L	0.00022	0.00010

Table 4-6: Duplicates Results – Analytes with RPD Greater Than 25%

Station	Date	Parameter	Units	RDL	Result1	Result2	RPD	PQL1	PQL2
W7	2022-09-14	Aluminum, total	mg/L	0.0030	0.0518	0.0362	35%	17.26667	12.06667
W7	2022-09-14	Ammonia, total	mg/L	0.0050	0.0137	0.0322	81%	2.74	6.44
W7	2022-09-14	Cadmium, total	mg/L	0.0000050	0.0000393	0.0000058	149%	7.86	1.16
W7	2022-09-14	Copper, total	mg/L	0.00050	0.00453	0.00135	108%	9.06	2.7
W7	2022-09-14	Potassium, total	mg/L	0.100	0.348	0.220	45%	3.48	2.2
W7	2022-09-14	Selenium, dissolved	mg/L	0.000050	0.000093	0.000127	31%	1.86	2.54

One field blank was sampled during the September 2022 monitoring program. The field blank returned five analytes detected (dissolved aluminum, total and dissolved barium, total and dissolved molybdenum) indicating minor contamination. The dissolved aluminum, total barium, and total and dissolved molybdenum were close to the reported detection limit (less than two times), so it is not expected to interfere with the water quality monitoring results in this report. Dissolved barium however, was measured to be greater than two times the detection limit (0.00022 mg/L result compared to 0.00010 detection limit).

One trip blank was carried during the June 2021 monitoring program. The trip blank returned one analyte detected (total ammonia), that was measured at 0.013 mg/L, compared to a detection limit of 0.005 mg/L, and was reanalysed to confirm the measurement. Although the concentration is only slightly higher than two times the detection limit, only one of the six stations had a higher concentration of total ammonia than the trip blank (HK-2) which would indicate minor contamination.

One trip blank was carried during the September 2022 monitoring program. The trip blank returned three analytes detected (total aluminum, barium, and zinc) indicating minor contamination. Total zinc was less than two times the reported detection limit, however aluminum and barium were both measured at five times greater than the detection limit. It should be noted however that barium in the field and trip blank was observed to be two orders of magnitude less than concentrations found at any site during the monitoring program, and therefore it is not

considered to be significant. All instances of barium were also reported to be less than the CCME WQGs. Total aluminum measured in the trip blank was 0.0167 mg/L, which was verified by reanalysis of the sample. This result is higher than station W1 (0.0039 mg/L), however, aluminum has been observed to be elevated in the historical dataset, and the SSWQO is 0.66 mg/L to account for enrichment in the region. It is expected that the elevated aluminum in the trip blank is related to field handling.

One surface water duplicate was collected during the September 2022 monitoring program at surface water station W7. Six analytes in the duplicate (total aluminum, ammonia, total cadmium, total copper, total potassium, and dissolved selenium) had RPD greater than 25%. Where analyte results have RPD greater than 25% a subsequent check was completed against the RDL to establish if the PQL was met. One of the analytes in the W7 duplicate had RPD greater than 25% and met the PQL (total aluminum).

Duplicate samples with analyte results that had both RPD greater than 25% and met the PQL can be attributed to sample handling, sample composition, or both. The duplicate samples were not split samples and were collected sequentially in the field. This can lead to natural variability between the samples based on site and sampling conditions (i.e., stream flow, change in weather conditions, disruption of sediment [TSS]). Additionally, the sample with RPD greater than 25% that met the PQL during the monitoring event comprised of only one analyte (approximately 1% of laboratory parameters); therefore, it does not affect the overall integrity of the samples.

Overall, the QA/QC results show that the sampling was carried out correctly and the laboratory results were reproducible. However, it is noted that the reliability of total aluminium concentrations from the 2022 dataset is uncertain. Although elevated aluminium concentrations have been remarked in the historical data sets, the RPD and trip blank results from the 2022 sampling event indicate that additional contamination may have occurred. Future sampling events should confirm the aluminium concentrations for the sites along Williams Creek, however, it appears that the 2022 reported concentrations are within historical ranges (averaging 0.10 to 0.39 mg/L, Access Consulting; 2011) and therefore do not have significant bearing on changes to water quality at the site.

5 CLOSING

Ensero and Tutchone would like to thank Granite Creek Copper for the opportunity to provide environmental services. Please reach out to Rachel Martz if you have any questions regarding this scope of work.

6 REFERENCES

British Columbia Ministry of Environment and Climate Change Strategy. 2021. British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture - Guideline Summary. Water Quality Guideline Series, WQG-20. Prov. B.C., Victoria B.C.

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Access Consulting. 2011. 2011 Environmental Monitoring Program Update and Data Summary Carmacks Copper Project, Yukon Territory. Prepared by Access Consulting for Copper North Mining Corp.

Minnow Environmental Inc. 2008. Evaluation of Water Quality and Development of Background-Based Site-Specific Water Quality Objectives for Williams Creek.

Resources Information Standards Committee (RISC). 2018. *Manual of British Columbia Hydrometric Standards, Version 2.0.* Prepared by Ministry of Environment and Climate Change Strategy, Knowledge Management Branch.

APPENDIX A

PHOTO LOG

Photo A - 1: W1 Sept 2022 (across)

Photo A - 2: W3 Sept 2022 (downstream)

Photo A - 3: W4 Sept 2022 (downstream)

Photo A - 4: W5 Sept 2022 (across)

Photo A - 5: W7 Sept 2022 (downstream)

APPENDIX B

CERTIFICATES OF ANALYSIS

Your Project #: Surface&Groundwater
Your C.O.C. #: 637023-01-01

Attention: Jillian Chown

TruePoint Exploration
904-409 Granville St
Vancouver, BC
Canada V6C 1T2

Report Date: 2021/06/11
Report #: R3031535
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C138183
Received: 2021/06/02, 16:55

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Acidity pH 4.5 & pH 8.3 (as CaCO3)	7	N/A	2021/06/04	BBY6SOP-00037	SM 23 2310 B m
Alkalinity - Low Level	7	N/A	2021/06/04	BBY6SOP-00026	SM 23 2320 B m
Low level chloride/sulphate by AC	7	N/A	2021/06/07	BBY6SOP-00011 / BBY6SOP-00017	SM23-4500-Cl/SO4-E m
Cyanide SAD (strong acid dissociable) (1)	7	N/A	2021/06/08	CAL SOP-00270	SM 23 4500-CN m
Conductance - Low Level	7	N/A	2021/06/04	BBY6SOP-00026	SM 23 2510 B m
Fluoride - Low Level	7	N/A	2021/06/09	BBY6SOP-00048	SM 23 4500-F C m
Hardness Total (calculated as CaCO3) (2)	1	N/A	2021/06/09	BBY WI-00033	Auto Calc
Hardness Total (calculated as CaCO3) (2)	6	N/A	2021/06/10	BBY WI-00033	Auto Calc
Hardness (calculated as CaCO3)	7	N/A	2021/06/05	BBY WI-00033	Auto Calc
Mercury (Dissolved) by CV (3)	7	2021/06/07	2021/06/07	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	7	2021/06/07	2021/06/07	AB SOP-00084	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	7	N/A	2021/06/05	BBY WI-00033	Auto Calc
Elements by CRC ICPMS (dissolved) (3)	7	N/A	2021/06/04	BBY7SOP-00002	EPA 6020b R2 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	2021/06/04	2021/06/09	BBY WI-00033	Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total)	6	2021/06/04	2021/06/10	BBY WI-00033	Auto Calc
Elements by CRC ICPMS (total)	7	2021/06/08	2021/06/09	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m
Nitrogen (Total)	7	N/A	2021/06/09	BBY6SOP-00016	SM 23 4500-N C m
Ammonia-N Low Level (Preserved) (1)	7	N/A	2021/06/10	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate+Nitrite (N) (low level)	7	N/A	2021/06/04	BBY6SOP-00010	SM 23 4500-NO3- I m
Nitrite (N) (low level)	7	N/A	2021/06/04	BBY6SOP-00010	SM 23 4500-NO3- I m
Nitrogen - Nitrate (as N) Low Level Calc	7	N/A	2021/06/04	BBY WI-00033	Auto Calc
Filter and HNO3 Preserve for Metals	6	N/A	2021/06/04	BBY7 WI-00004	SM 23 3030B m
pH @25°C (4)	7	N/A	2021/06/04	BBY6SOP-00026	SM 23 4500-H+ B m
Orthophosphate by Konelab (low level) (5)	7	N/A	2021/06/04	BBY6SOP-00013	SM 23 4500-P E m
Total Dissolved Solids - Low Level (1)	7	2021/06/07	2021/06/07	AB SOP-00065	SM 23 2540 C m
Total Kjeldahl Nitrogen (Total)	7	N/A	2021/06/09	BBY WI-00033	Auto Calc
Carbon (Total Organic) (1, 6)	7	N/A	2021/06/10	AB SOP-00087	MMCW 119 1996 m
Total Phosphorus (1)	7	2021/06/10	2021/06/10	AB SOP-00024	SM 23 4500-P A,B,F m
Total Suspended Solids (NFR)	6	2021/06/08	2021/06/09	BBY6SOP-00034	SM 23 2540 D m
Turbidity	7	N/A	2021/06/04	BBY6SOP-00027	SM 23 2130 B m

Your Project #: Surface&Groundwater
Your C.O.C. #: 637023-01-01

Attention: Jillian Chown

TruePoint Exploration
904-409 Granville St
Vancouver, BC
Canada V6C 1T2

Report Date: 2021/06/11
Report #: R3031535
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C138183
Received: 2021/06/02, 16:55

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas Calgary Environmental
(2) "Total Hardness" was calculated from Total Ca and Mg concentrations and may be biased high (Hardness, or Dissolved Hardness, calculated from Dissolved Ca and Mg, should be used for compliance if available).
(3) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas Laboratories endeavours to analyze samples as soon as possible after receipt.
(5) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
(6) TOC present in the sample should be considered as non-purgeable TOC.

Your Project #: Surface&Groundwater
Your C.O.C. #: 637023-01-01

Attention: Jillian Chown

TruePoint Exploration
904-409 Granville St
Vancouver, BC
Canada V6C 1T2

Report Date: 2021/06/11
Report #: R3031535
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C138183
Received: 2021/06/02, 16:55

Encryption Key

Diana Fausto
Customer Solutions Representative
11 Jun 2021 16:37:21

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bureauveritas.com
Phone# (604) 734 7276

==========

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: C138183
Report Date: 2021/06/11

TruePoint Exploration
Client Project #: Surface&Groundwater

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID				ZX5686		ZX5687		ZX5688		
Sampling Date				2021/06/01 11:42		2021/06/01 12:20		2021/06/01 13:27		
COC Number				637023-01-01		637023-01-01		637023-01-01		
	UNITS	FW	MAR	STU-1	QC Batch	HK-2	RDL	Y1	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	-	-	FIELD	ONSITE	FIELD	N/A	FIELD	N/A	ONSITE
Nitrate (N)	mg/L	-	-	<0.020	A245442	<0.020	0.020	0.038	0.020	A245442
Total Total Kjeldahl Nitrogen (Calc)	mg/L	-	-	0.616	A245128	0.628	0.020	0.806	0.020	A245128
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	0.00109	A246973	0.00114	0.00050	0.00151	0.00050	A246973
Fluoride (F)	mg/L	0.12	-	**0.130**	A250207	**0.180**	0.010	**0.180**	0.010	A250207
pH	pH	6.5:9.0	7.0:8.7	7.48	A247270	7.92	N/A	7.61	N/A	A247270
Acidity (pH 4.5)	mg/L	-	-	<1.0	A247362	<1.0	1.0	<1.0	1.0	A247362
Alkalinity (Total as CaCO3)	mg/L	-	-	54.8	A247273	103	0.50	68.4	0.50	A247273
Total Organic Carbon (C)	mg/L	-	-	16	A250497	20	0.50	31 (1)	2.5	A250499
Acidity (pH 8.3)	mg/L	-	-	<1.0	A247362	<1.0	1.0	<1.0	1.0	A247362
Alkalinity (PP as CaCO3)	mg/L	-	-	<0.50	A247273	<0.50	0.50	<0.50	0.50	A247273
Bicarbonate (HCO3)	mg/L	-	-	66.8	A247273	126	0.50	83.5	0.50	A247273
Carbonate (CO3)	mg/L	-	-	<0.50	A247273	<0.50	0.50	<0.50	0.50	A247273
Hydroxide (OH)	mg/L	-	-	<0.50	A247273	<0.50	0.50	<0.50	0.50	A247273
Total Suspended Solids	mg/L	-	-	75	A248307	12	1.0	62	1.0	A248307
Anions										
Orthophosphate (P)	mg/L	-	-	0.0018	A245326	0.0039	0.0010	0.0040	0.0010	A245326
Dissolved Chloride (Cl)	mg/L	120	-	<0.50	A247462	0.88	0.50	1.1	0.50	A247462
Dissolved Sulphate (SO4)	mg/L	-	-	<0.50	A247462	<0.50	0.50	0.90	0.50	A247462
Nutrients										
Total Phosphorus (P)	mg/L	-	-	0.056	A250529	0.024	0.0030	0.057	0.0030	A250529
Total Ammonia (N)	mg/L	-	-	0.012	A250893	0.015	0.0050	0.011	0.0050	A250893
Nitrate plus Nitrite (N)	mg/L	-	-	<0.020 (2)	A245606	<0.020 (2)	0.020	0.038 (2)	0.020	A245606
Nitrite (N)	mg/L	0.06	-	<0.020 (2)	A245613	<0.020 (2)	0.020	<0.020 (2)	0.020	A245613
Total Nitrogen (N)	mg/L	-	-	0.616	A248334	0.628	0.020	0.844	0.020	A248334
Physical Properties										
Conductivity	uS/cm	-	-	121	A247275	216	1.0	165	1.0	A247275
Physical Properties										
Turbidity	NTU	-	-	8.1	A245467	6.3	0.10	19	0.10	A245467

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to sample matrix.
(2) RDL raised due to sample matrix interference.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

BV Labs Job #: C138183
Report Date: 2021/06/11

TruePoint Exploration
Client Project #: Surface&Groundwater

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID				ZX5686		ZX5687		ZX5688		
Sampling Date				2021/06/01 11:42		2021/06/01 12:20		2021/06/01 13:27		
COC Number				637023-01-01		637023-01-01		637023-01-01		
	UNITS	FW	MAR	STU-1	QC Batch	HK-2	RDL	Y1	RDL	QC Batch
Total Dissolved Solids	mg/L	-	-	116 (1)	A247417	165 (1)	1.3	157 (1)	1.3	A247417

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
(1) Detection limits raised due to insufficient sample volume.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID				ZX5689			ZX5690		
Sampling Date				2021/06/01 13:53			2021/06/01 10:36		
COC Number				637023-01-01			637023-01-01		
	UNITS	FW	MAR	Y2	RDL	QC Batch	NL-1	RDL	QC Batch
Calculated Parameters									
Filter and HNO3 Preservation	N/A	-	-	FIELD	N/A	ONSITE	FIELD	N/A	ONSITE
Nitrate (N)	mg/L	-	-	0.0305	0.0020	A245442	<0.020	0.020	A245442
Total Total Kjeldahl Nitrogen (Calc)	mg/L	-	-	0.272	0.020	A245128	0.678	0.020	A245128
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	0.00054	0.00050	A246973	0.00131	0.00050	A246973
Fluoride (F)	mg/L	0.12	-	0.120	0.010	A250207	0.089	0.010	A250207
pH	pH	6.5:9.0	7.0:8.7	7.72	N/A	A247270	7.52	N/A	A247270
Acidity (pH 4.5)	mg/L	-	-	<1.0	1.0	A247362	<1.0	1.0	A247362
Alkalinity (Total as CaCO3)	mg/L	-	-	72.1	0.50	A247273	52.6	0.50	A247273
Total Organic Carbon (C)	mg/L	-	-	6.8	0.50	A250499	27 (1)	2.5	A250499
Acidity (pH 8.3)	mg/L	-	-	<1.0	1.0	A247362	<1.0	1.0	A247362
Alkalinity (PP as CaCO3)	mg/L	-	-	<0.50	0.50	A247273	<0.50	0.50	A247273
Bicarbonate (HCO3)	mg/L	-	-	88.0	0.50	A247273	64.1	0.50	A247273
Carbonate (CO3)	mg/L	-	-	<0.50	0.50	A247273	<0.50	0.50	A247273
Hydroxide (OH)	mg/L	-	-	<0.50	0.50	A247273	<0.50	0.50	A247273
Total Suspended Solids	mg/L	-	-	64	1.0	A248286	4.8	1.0	A248307
Anions									
Orthophosphate (P)	mg/L	-	-	0.0013	0.0010	A245326	0.0020	0.0010	A245326
Dissolved Chloride (Cl)	mg/L	120	-	<0.50	0.50	A247462	0.70	0.50	A247462
Dissolved Sulphate (SO4)	mg/L	-	-	14	0.50	A247462	<0.50	0.50	A247462
Nutrients									
Total Phosphorus (P)	mg/L	-	-	0.046	0.0030	A250529	0.0074	0.0030	A250529
Total Ammonia (N)	mg/L	-	-	<0.0050	0.0050	A250893	0.0093	0.0050	A250893
Nitrate plus Nitrite (N)	mg/L	-	-	0.0305	0.0020	A245606	<0.020 (2)	0.020	A245606
Nitrite (N)	mg/L	0.06	-	<0.0020	0.0020	A245613	<0.020 (2)	0.020	A245613
Total Nitrogen (N)	mg/L	-	-	0.303	0.020	A248334	0.678	0.020	A248334
Physical Properties									
Conductivity	uS/cm	-	-	171	1.0	A247275	112	1.0	A247275
Physical Properties									
Turbidity	NTU	-	-	17	0.10	A245467	1.1	0.10	A245467

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to sample matrix.
(2) RDL raised due to sample matrix interference.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

BV Labs Job #: C138183
Report Date: 2021/06/11

TruePoint Exploration
Client Project #: Surface&Groundwater

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID				ZX5689			ZX5690		
Sampling Date				2021/06/01 13:53			2021/06/01 10:36		
COC Number				637023-01-01			637023-01-01		
	UNITS	FW	MAR	Y2	RDL	QC Batch	NL-1	RDL	QC Batch
Total Dissolved Solids	mg/L	-	-	115 (1)	1.3	A247417	117 (1)	1.3	A247417

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
(1) Detection limits raised due to insufficient sample volume.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID				ZX5691			ZX5692		
Sampling Date				2021/06/01 11:08			2021/06/02 16:40		
COC Number				637023-01-01			637023-01-01		
	UNITS	FW	MAR	HK-1	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Calculated Parameters									
Filter and HNO3 Preservation	N/A	-	-	FIELD	N/A	ONSITE	N/A	N/A	ONSITE
Nitrate (N)	mg/L	-	-	<0.020	0.020	A245442	<0.0020	0.0020	A245442
Total Total Kjeldahl Nitrogen (Calc)	mg/L	-	-	0.581	0.020	A245128	0.020	0.020	A245128
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	-	-	0.00117	0.00050	A246973	<0.00050	0.00050	A246973
Fluoride (F)	mg/L	0.12	-	0.120	0.010	A250207	<0.010	0.010	A250207
pH	pH	6.5:9.0	7.0:8.7	7.86	N/A	A247270	**5.94**	N/A	A247270
Acidity (pH 4.5)	mg/L	-	-	<1.0	1.0	A247362	<1.0	1.0	A247362
Alkalinity (Total as CaCO3)	mg/L	-	-	98.7	0.50	A247273	0.77	0.50	A247273
Total Organic Carbon (C)	mg/L	-	-	18 (1)	2.5	A250499	0.59	0.50	A250497
Acidity (pH 8.3)	mg/L	-	-	<1.0	1.0	A247362	<1.0	1.0	A247362
Alkalinity (PP as CaCO3)	mg/L	-	-	<0.50	0.50	A247273	<0.50	0.50	A247273
Bicarbonate (HCO3)	mg/L	-	-	120	0.50	A247273	0.94	0.50	A247273
Carbonate (CO3)	mg/L	-	-	<0.50	0.50	A247273	<0.50	0.50	A247273
Hydroxide (OH)	mg/L	-	-	<0.50	0.50	A247273	<0.50	0.50	A247273
Total Suspended Solids	mg/L	-	-	22	1.0	A248286	N/A	N/A	N/A
Anions									
Orthophosphate (P)	mg/L	-	-	0.0040	0.0010	A245326	<0.0010	0.0010	A245326
Dissolved Chloride (Cl)	mg/L	120	-	0.66	0.50	A247462	<0.50	0.50	A247457
Dissolved Sulphate (SO4)	mg/L	-	-	<0.50	0.50	A247462	<0.50	0.50	A247457
Nutrients									
Total Phosphorus (P)	mg/L	-	-	0.022	0.0030	A250529	<0.0030	0.0030	A250529
Total Ammonia (N)	mg/L	-	-	0.0055	0.0050	A250893	0.013	0.0050	A251523
Nitrate plus Nitrite (N)	mg/L	-	-	<0.020 (2)	0.020	A245606	<0.0020	0.0020	A245606
Nitrite (N)	mg/L	0.06	-	<0.020 (2)	0.020	A245613	<0.0020	0.0020	A245613
Total Nitrogen (N)	mg/L	-	-	0.581	0.020	A248334	0.020	0.020	A248320
Physical Properties									
Conductivity	uS/cm	-	-	198	1.0	A247275	1.7	1.0	A247275
Physical Properties									
Turbidity	NTU	-	-	9.4	0.10	A245467	<0.10	0.10	A245467

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to sample matrix.
(2) RDL raised due to sample matrix interference.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

BV Labs Job #: C138183
Report Date: 2021/06/11

TruePoint Exploration
Client Project #: Surface&Groundwater

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID				ZX5691			ZX5692		
Sampling Date				2021/06/01 11:08			2021/06/02 16:40		
COC Number				637023-01-01			637023-01-01		
	UNITS	FW	MAR	HK-1	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Total Dissolved Solids	mg/L	-	-	155 (1)	1.2	A247417	<1.1 (1)	1.1	A247417

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
(1) Detection limits raised due to insufficient sample volume.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5686	ZX5687	ZX5688	ZX5689	ZX5690		
Sampling Date				2021/06/01 11:42	2021/06/01 12:20	2021/06/01 13:27	2021/06/01 13:53	2021/06/01 10:36		
COC Number				637023-01-01	637023-01-01	637023-01-01	637023-01-01	637023-01-01		
	UNITS	FW	MAR	STU-1	HK-2	Y1	Y2	NL-1	RDL	QC Batch
Calculated Parameters										
Dissolved Hardness (CaCO3)	mg/L	-	-	55.8	91.9	75.9	73.6	55.9	0.50	A244920
Elements										
Dissolved Mercury (Hg)	ug/L	0.026	0.016	0.0028	0.0032	0.0042	<0.0019	0.0042	0.0019	A247159
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	ug/L	-	-	27.2	22.7	32.2	12.5	55.3	3.0	A245506
Dissolved Antimony (Sb)	ug/L	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A245506
Dissolved Arsenic (As)	ug/L	5	12.5	0.31	0.52	0.47	0.44	0.38	0.10	A245506
Dissolved Barium (Ba)	ug/L	-	-	32.3	42.6	25.4	29.8	18.1	1.0	A245506
Dissolved Beryllium (Be)	ug/L	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	A245506
Dissolved Bismuth (Bi)	ug/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	A245506
Dissolved Boron (B)	ug/L	1500	-	<50	<50	<50	<50	<50	50	A245506
Dissolved Cadmium (Cd)	ug/L	-	0.12	<0.010	<0.010	0.011	<0.010	<0.010	0.010	A245506
Dissolved Chromium (Cr)	ug/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	A245506
Dissolved Cobalt (Co)	ug/L	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	A245506
Dissolved Copper (Cu)	ug/L	-	-	1.41	1.91	2.34	1.07	1.88	0.20	A245506
Dissolved Iron (Fe)	ug/L	300	-	123	125	157	50.6	186	5.0	A245506
Dissolved Lead (Pb)	ug/L	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	A245506
Dissolved Lithium (Li)	ug/L	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	A245506
Dissolved Manganese (Mn)	ug/L	-	-	17.8	5.6	2.9	4.5	7.5	1.0	A245506
Dissolved Molybdenum (Mo)	ug/L	73	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	A245506
Dissolved Nickel (Ni)	ug/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	A245506
Dissolved Selenium (Se)	ug/L	1	-	<0.10	<0.10	<0.10	0.15	<0.10	0.10	A245506
Dissolved Silicon (Si)	ug/L	-	-	5140	5080	5490	3300	4900	100	A245506
Dissolved Silver (Ag)	ug/L	0.25	7.5	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	A245506
Dissolved Strontium (Sr)	ug/L	-	-	96.4	240	174	114	84.9	1.0	A245506
Dissolved Thallium (Tl)	ug/L	0.8	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	A245506
Dissolved Tin (Sn)	ug/L	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	A245506
Dissolved Titanium (Ti)	ug/L	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	A245506
Dissolved Uranium (U)	ug/L	15	-	<0.10	0.43	0.25	0.76	<0.10	0.10	A245506
Dissolved Vanadium (V)	ug/L	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	A245506
Dissolved Zinc (Zn)	ug/L	30	-	<5.0	<5.0	<5.0	<5.0	11.5	5.0	A245506
Dissolved Zirconium (Zr)	ug/L	-	-	0.25	0.35	0.38	0.10	0.34	0.10	A245506
Dissolved Calcium (Ca)	mg/L	-	-	17.4	23.8	22.4	20.8	17.1	0.050	A244921

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5686	ZX5687	ZX5688	ZX5689	ZX5690		
Sampling Date				2021/06/01 11:42	2021/06/01 12:20	2021/06/01 13:27	2021/06/01 13:53	2021/06/01 10:36		
COC Number				637023-01-01	637023-01-01	637023-01-01	637023-01-01	637023-01-01		
	UNITS	FW	MAR	STU-1	HK-2	Y1	Y2	NL-1	RDL	QC Batch
Dissolved Magnesium (Mg)	mg/L	-	-	2.97	7.90	4.84	5.27	3.20	0.050	A244921
Dissolved Potassium (K)	mg/L	-	-	0.544	0.789	0.546	0.722	0.355	0.050	A244921
Dissolved Sodium (Na)	mg/L	-	-	2.60	8.14	4.19	2.17	3.23	0.050	A244921
Dissolved Sulphur (S)	mg/L	-	-	<3.0	<3.0	3.2	3.8	<3.0	3.0	A244921

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

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CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5691	ZX5692		
Sampling Date				2021/06/01 11:08	2021/06/02 16:40		
COC Number				637023-01-01	637023-01-01		
	UNITS	FW	MAR	HK-1	TRIP BLANK	RDL	QC Batch
Calculated Parameters							
Dissolved Hardness (CaCO3)	mg/L	-	-	81.9	<0.50	0.50	A244920
Elements							
Dissolved Mercury (Hg)	ug/L	0.026	0.016	0.0035	<0.0019	0.0019	A247159
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	ug/L	-	-	23.2	<3.0	3.0	A245506
Dissolved Antimony (Sb)	ug/L	-	-	<0.50	<0.50	0.50	A245506
Dissolved Arsenic (As)	ug/L	5	12.5	0.51	<0.10	0.10	A245506
Dissolved Barium (Ba)	ug/L	-	-	52.1	<1.0	1.0	A245506
Dissolved Beryllium (Be)	ug/L	-	-	<0.10	<0.10	0.10	A245506
Dissolved Bismuth (Bi)	ug/L	-	-	<1.0	<1.0	1.0	A245506
Dissolved Boron (B)	ug/L	1500	-	<50	<50	50	A245506
Dissolved Cadmium (Cd)	ug/L	-	0.12	<0.010	<0.010	0.010	A245506
Dissolved Chromium (Cr)	ug/L	-	-	<1.0	<1.0	1.0	A245506
Dissolved Cobalt (Co)	ug/L	-	-	<0.20	<0.20	0.20	A245506
Dissolved Copper (Cu)	ug/L	-	-	1.70	<0.20	0.20	A245506
Dissolved Iron (Fe)	ug/L	300	-	182	<5.0	5.0	A245506
Dissolved Lead (Pb)	ug/L	-	-	<0.20	<0.20	0.20	A245506
Dissolved Lithium (Li)	ug/L	-	-	<2.0	<2.0	2.0	A245506
Dissolved Manganese (Mn)	ug/L	-	-	5.1	<1.0	1.0	A245506
Dissolved Molybdenum (Mo)	ug/L	73	-	<1.0	<1.0	1.0	A245506
Dissolved Nickel (Ni)	ug/L	-	-	<1.0	<1.0	1.0	A245506
Dissolved Selenium (Se)	ug/L	1	-	<0.10	<0.10	0.10	A245506
Dissolved Silicon (Si)	ug/L	-	-	4890	<100	100	A245506
Dissolved Silver (Ag)	ug/L	0.25	7.5	<0.020	<0.020	0.020	A245506
Dissolved Strontium (Sr)	ug/L	-	-	215	<1.0	1.0	A245506
Dissolved Thallium (Tl)	ug/L	0.8	-	<0.010	<0.010	0.010	A245506
Dissolved Tin (Sn)	ug/L	-	-	<5.0	<5.0	5.0	A245506
Dissolved Titanium (Ti)	ug/L	-	-	<5.0	<5.0	5.0	A245506
Dissolved Uranium (U)	ug/L	15	-	0.36	<0.10	0.10	A245506
Dissolved Vanadium (V)	ug/L	-	-	<5.0	<5.0	5.0	A245506
Dissolved Zinc (Zn)	ug/L	30	-	<5.0	<5.0	5.0	A245506
Dissolved Zirconium (Zr)	ug/L	-	-	0.37	<0.10	0.10	A245506
Dissolved Calcium (Ca)	mg/L	-	-	20.4	<0.050	0.050	A244921

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5691	ZX5692		
Sampling Date				2021/06/01 11:08	2021/06/02 16:40		
COC Number				637023-01-01	637023-01-01		
	UNITS	FW	MAR	HK-1	TRIP BLANK	RDL	QC Batch
Dissolved Magnesium (Mg)	mg/L	-	-	7.52	<0.050	0.050	A244921
Dissolved Potassium (K)	mg/L	-	-	0.700	<0.050	0.050	A244921
Dissolved Sodium (Na)	mg/L	-	-	9.56	<0.050	0.050	A244921
Dissolved Sulphur (S)	mg/L	-	-	<3.0	<3.0	3.0	A244921

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

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CSR TOTAL METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5686	ZX5687	ZX5688	ZX5689	ZX5690		
Sampling Date				2021/06/01 11:42	2021/06/01 12:20	2021/06/01 13:27	2021/06/01 13:53	2021/06/01 10:36		
COC Number				637023-01-01	637023-01-01	637023-01-01	637023-01-01	637023-01-01		
	UNITS	FW	MAR	STU-1	HK-2	Y1	Y2	NL-1	RDL	QC Batch
Calculated Parameters										
Total Hardness (CaCO3)	mg/L	-	-	62.8	97.5	88.3	87.8	58.7	0.50	A244919
Elements										
Total Mercury (Hg)	ug/L	0.026	0.016	0.0030	0.0023	0.0040	<0.0019	0.0052	0.0019	A247482
Total Metals by ICPMS										
Total Aluminum (Al)	ug/L	-	-	716	350	1310	1090	89.1	3.0	A248655
Total Antimony (Sb)	ug/L	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A248655
Total Arsenic (As)	ug/L	5	12.5	0.52	0.61	1.04	1.11	0.40	0.10	A248655
Total Barium (Ba)	ug/L	-	-	49.5	52.0	55.4	54.5	20.3	1.0	A248655
Total Beryllium (Be)	ug/L	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	A248655
Total Bismuth (Bi)	ug/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	A248655
Total Boron (B)	ug/L	1500	-	<50	<50	<50	<50	<50	50	A248655
Total Cadmium (Cd)	ug/L	-	0.12	0.038	<0.010	0.041	0.031	<0.010	0.010	A248655
Total Chromium (Cr)	ug/L	-	-	1.0	<1.0	2.3	2.2	<1.0	1.0	A248655
Total Cobalt (Co)	ug/L	-	-	0.46	0.24	0.88	0.81	<0.20	0.20	A248655
Total Copper (Cu)	ug/L	-	-	2.81	2.58	5.27	3.37	1.97	0.50	A248655
Total Iron (Fe)	ug/L	300	-	**1160**	**564**	**2040**	**1740**	256	10	A248655
Total Lead (Pb)	ug/L	-	-	0.35	<0.20	0.92	0.61	<0.20	0.20	A248655
Total Lithium (Li)	ug/L	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	A248655
Total Manganese (Mn)	ug/L	-	-	34.2	30.8	59.8	52.5	12.3	1.0	A248655
Total Molybdenum (Mo)	ug/L	73	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	A248655
Total Nickel (Ni)	ug/L	-	-	1.2	1.2	3.2	3.0	<1.0	1.0	A248655
Total Phosphorus (P)	ug/L	-	-	47	27	62	63	<10	10	A248655
Total Selenium (Se)	ug/L	1	-	<0.10	<0.10	0.10	0.17	<0.10	0.10	A248655
Total Silicon (Si)	ug/L	-	-	6710	5990	8140	5570	5230	100	A248655
Total Silver (Ag)	ug/L	0.25	7.5	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	A248655
Total Strontium (Sr)	ug/L	-	-	104	256	193	134	91.8	1.0	A248655
Total Thallium (Tl)	ug/L	0.8	-	<0.010	<0.010	0.014	0.013	<0.010	0.010	A248655
Total Tin (Sn)	ug/L	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	A248655
Total Titanium (Ti)	ug/L	-	-	29.8	12.7	43.2	47.1	<5.0	5.0	A248655
Total Uranium (U)	ug/L	15	-	<0.10	0.47	0.36	0.90	<0.10	0.10	A248655
Total Vanadium (V)	ug/L	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	A248655
Total Zinc (Zn)	ug/L	30	-	7.1	<5.0	7.7	5.8	<5.0	5.0	A248655
Total Zirconium (Zr)	ug/L	-	-	0.27	0.36	0.61	0.25	0.30	0.10	A248655

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

CSR TOTAL METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5686	ZX5687	ZX5688	ZX5689	ZX5690		
Sampling Date				2021/06/01 11:42	2021/06/01 12:20	2021/06/01 13:27	2021/06/01 13:53	2021/06/01 10:36		
COC Number				637023-01-01	637023-01-01	637023-01-01	637023-01-01	637023-01-01		
	UNITS	FW	MAR	STU-1	HK-2	Y1	Y2	NL-1	RDL	QC Batch
Total Calcium (Ca)	mg/L	-	-	19.7	25.1	25.7	24.5	18.0	0.050	A244922
Total Magnesium (Mg)	mg/L	-	-	3.29	8.44	5.85	6.46	3.37	0.050	A244922
Total Potassium (K)	mg/L	-	-	0.678	0.907	0.869	1.03	0.353	0.050	A244922
Total Sodium (Na)	mg/L	-	-	2.73	8.68	4.61	2.49	3.46	0.050	A244922
Total Sulphur (S)	mg/L	-	-	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	A244922

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR TOTAL METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5691		ZX5692		
Sampling Date				2021/06/01 11:08		2021/06/02 16:40		
COC Number				637023-01-01		637023-01-01		
	UNITS	FW	MAR	HK-1	QC Batch	TRIP BLANK	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO3)	mg/L	-	-	87.5	A244919	<0.50	0.50	A244919
Elements								
Total Mercury (Hg)	ug/L	0.026	0.016	0.0029	A247482	<0.0019	0.0019	A247482
Total Metals by ICPMS								
Total Aluminum (Al)	ug/L	-	-	388	A248655	<3.0	3.0	A248581
Total Antimony (Sb)	ug/L	-	-	<0.50	A248655	<0.50	0.50	A248581
Total Arsenic (As)	ug/L	5	12.5	0.64	A248655	<0.10	0.10	A248581
Total Barium (Ba)	ug/L	-	-	61.3	A248655	<1.0	1.0	A248581
Total Beryllium (Be)	ug/L	-	-	<0.10	A248655	<0.10	0.10	A248581
Total Bismuth (Bi)	ug/L	-	-	<1.0	A248655	<1.0	1.0	A248581
Total Boron (B)	ug/L	1500	-	<50	A248655	<50	50	A248581
Total Cadmium (Cd)	ug/L	-	0.12	<0.010	A248655	<0.010	0.010	A248581
Total Chromium (Cr)	ug/L	-	-	<1.0	A248655	<1.0	1.0	A248581
Total Cobalt (Co)	ug/L	-	-	0.24	A248655	<0.20	0.20	A248581
Total Copper (Cu)	ug/L	-	-	2.31	A248655	<0.50	0.50	A248581
Total Iron (Fe)	ug/L	300	-	**677**	A248655	<10	10	A248581
Total Lead (Pb)	ug/L	-	-	<0.20	A248655	<0.20	0.20	A248581
Total Lithium (Li)	ug/L	-	-	<2.0	A248655	<2.0	2.0	A248581
Total Manganese (Mn)	ug/L	-	-	27.7	A248655	<1.0	1.0	A248581
Total Molybdenum (Mo)	ug/L	73	-	<1.0	A248655	<1.0	1.0	A248581
Total Nickel (Ni)	ug/L	-	-	1.1	A248655	<1.0	1.0	A248581
Total Phosphorus (P)	ug/L	-	-	29	A248655	<10	10	A248581
Total Selenium (Se)	ug/L	1	-	<0.10	A248655	<0.10	0.10	A248581
Total Silicon (Si)	ug/L	-	-	6070	A248655	<100	100	A248581
Total Silver (Ag)	ug/L	0.25	7.5	<0.020	A248655	<0.020	0.020	A248581
Total Strontium (Sr)	ug/L	-	-	233	A248655	<1.0	1.0	A248581
Total Thallium (Tl)	ug/L	0.8	-	<0.010	A248655	<0.010	0.010	A248581
Total Tin (Sn)	ug/L	-	-	<5.0	A248655	<5.0	5.0	A248581
Total Titanium (Ti)	ug/L	-	-	14.1	A248655	<5.0	5.0	A248581
Total Uranium (U)	ug/L	15	-	0.40	A248655	<0.10	0.10	A248581
Total Vanadium (V)	ug/L	-	-	<5.0	A248655	<5.0	5.0	A248581
Total Zinc (Zn)	ug/L	30	-	<5.0	A248655	<5.0	5.0	A248581
Total Zirconium (Zr)	ug/L	-	-	0.41	A248655	<0.10	0.10	A248581

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

CSR TOTAL METALS IN WATER WITH CV HG (WATER)

BV Labs ID				ZX5691		ZX5692		
Sampling Date				2021/06/01 11:08		2021/06/02 16:40		
COC Number				637023-01-01		637023-01-01		
	UNITS	FW	MAR	HK-1	QC Batch	TRIP BLANK	RDL	QC Batch
Total Calcium (Ca)	mg/L	-	-	21.9	A244922	<0.050	0.050	A244922
Total Magnesium (Mg)	mg/L	-	-	7.98	A244922	<0.050	0.050	A244922
Total Potassium (K)	mg/L	-	-	0.820	A244922	<0.050	0.050	A244922
Total Sodium (Na)	mg/L	-	-	10.1	A244922	0.091	0.050	A244922
Total Sulphur (S)	mg/L	-	-	<3.0	A244922	<3.0	3.0	A244922

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

GENERAL COMMENTS

FW,MAR: Canadian Environmental Quality Guidelines for the Protection of Aquatic Life (CCME)
Cadmium Guideline (Freshwater): A) 0.04 ug/L when hardness is 0-17 mg/L, B) 0.37 ug/L if hardness > 280 mg/L C) = 10 to the power of {0.86[log (hardness)]-2.46} when hardness is 17-280 mg/L.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.

Results relate only to the items tested.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A245326	TL9	Spiked Blank	Orthophosphate (P)	2021/06/04		100	%	80 - 120
A245326	TL9	Method Blank	Orthophosphate (P)	2021/06/04	<0.0010		mg/L	
A245467	BTM	Spiked Blank	Turbidity	2021/06/04		99	%	80 - 120
A245467	BTM	Method Blank	Turbidity	2021/06/04	<0.10		NTU	
A245467	BTM	RPD	Turbidity	2021/06/04	0		%	20
A245506	JLP	Matrix Spike	Dissolved Aluminum (Al)	2021/06/04		94	%	80 - 120
			Dissolved Antimony (Sb)	2021/06/04		100	%	80 - 120
			Dissolved Arsenic (As)	2021/06/04		102	%	80 - 120
			Dissolved Barium (Ba)	2021/06/04		97	%	80 - 120
			Dissolved Beryllium (Be)	2021/06/04		92	%	80 - 120
			Dissolved Bismuth (Bi)	2021/06/04		88	%	80 - 120
			Dissolved Boron (B)	2021/06/04		88	%	80 - 120
			Dissolved Cadmium (Cd)	2021/06/04		92	%	80 - 120
			Dissolved Chromium (Cr)	2021/06/04		90	%	80 - 120
			Dissolved Cobalt (Co)	2021/06/04		89	%	80 - 120
			Dissolved Copper (Cu)	2021/06/04		81	%	80 - 120
			Dissolved Iron (Fe)	2021/06/04		91	%	80 - 120
			Dissolved Lead (Pb)	2021/06/04		94	%	80 - 120
			Dissolved Lithium (Li)	2021/06/04		91	%	80 - 120
			Dissolved Manganese (Mn)	2021/06/04		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2021/06/04		112	%	80 - 120
			Dissolved Nickel (Ni)	2021/06/04		82	%	80 - 120
			Dissolved Selenium (Se)	2021/06/04		96	%	80 - 120
			Dissolved Silicon (Si)	2021/06/04		91	%	80 - 120
			Dissolved Silver (Ag)	2021/06/04		91	%	80 - 120
			Dissolved Strontium (Sr)	2021/06/04		NC	%	80 - 120
			Dissolved Thallium (Tl)	2021/06/04		94	%	80 - 120
			Dissolved Tin (Sn)	2021/06/04		94	%	80 - 120
			Dissolved Titanium (Ti)	2021/06/04		96	%	80 - 120
			Dissolved Uranium (U)	2021/06/04		98	%	80 - 120
			Dissolved Vanadium (V)	2021/06/04		95	%	80 - 120
			Dissolved Zinc (Zn)	2021/06/04		81	%	80 - 120
			Dissolved Zirconium (Zr)	2021/06/04		107	%	80 - 120
A245506	JLP	Spiked Blank	Dissolved Aluminum (Al)	2021/06/04		97	%	80 - 120
			Dissolved Antimony (Sb)	2021/06/04		101	%	80 - 120
			Dissolved Arsenic (As)	2021/06/04		98	%	80 - 120
			Dissolved Barium (Ba)	2021/06/04		98	%	80 - 120
			Dissolved Beryllium (Be)	2021/06/04		92	%	80 - 120
			Dissolved Bismuth (Bi)	2021/06/04		96	%	80 - 120
			Dissolved Boron (B)	2021/06/04		94	%	80 - 120
			Dissolved Cadmium (Cd)	2021/06/04		99	%	80 - 120
			Dissolved Chromium (Cr)	2021/06/04		98	%	80 - 120
			Dissolved Cobalt (Co)	2021/06/04		98	%	80 - 120
			Dissolved Copper (Cu)	2021/06/04		96	%	80 - 120
			Dissolved Iron (Fe)	2021/06/04		98	%	80 - 120
			Dissolved Lead (Pb)	2021/06/04		98	%	80 - 120
			Dissolved Lithium (Li)	2021/06/04		91	%	80 - 120
			Dissolved Manganese (Mn)	2021/06/04		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2021/06/04		100	%	80 - 120
			Dissolved Nickel (Ni)	2021/06/04		97	%	80 - 120
			Dissolved Selenium (Se)	2021/06/04		97	%	80 - 120
			Dissolved Silicon (Si)	2021/06/04		96	%	80 - 120
			Dissolved Silver (Ag)	2021/06/04		97	%	80 - 120
			Dissolved Strontium (Sr)	2021/06/04		98	%	80 - 120
			Dissolved Thallium (Tl)	2021/06/04		98	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Tin (Sn)	2021/06/04		97	%	80 - 120
			Dissolved Titanium (Ti)	2021/06/04		100	%	80 - 120
			Dissolved Uranium (U)	2021/06/04		99	%	80 - 120
			Dissolved Vanadium (V)	2021/06/04		98	%	80 - 120
			Dissolved Zinc (Zn)	2021/06/04		99	%	80 - 120
			Dissolved Zirconium (Zr)	2021/06/04		96	%	80 - 120
A245506	JLP	Method Blank	Dissolved Aluminum (Al)	2021/06/04	<3.0		ug/L	
			Dissolved Antimony (Sb)	2021/06/04	<0.50		ug/L	
			Dissolved Arsenic (As)	2021/06/04	<0.10		ug/L	
			Dissolved Barium (Ba)	2021/06/04	<1.0		ug/L	
			Dissolved Beryllium (Be)	2021/06/04	<0.10		ug/L	
			Dissolved Bismuth (Bi)	2021/06/04	<1.0		ug/L	
			Dissolved Boron (B)	2021/06/04	<50		ug/L	
			Dissolved Cadmium (Cd)	2021/06/04	<0.010		ug/L	
			Dissolved Chromium (Cr)	2021/06/04	<1.0		ug/L	
			Dissolved Cobalt (Co)	2021/06/04	<0.20		ug/L	
			Dissolved Copper (Cu)	2021/06/04	<0.20		ug/L	
			Dissolved Iron (Fe)	2021/06/04	<5.0		ug/L	
			Dissolved Lead (Pb)	2021/06/04	<0.20		ug/L	
			Dissolved Lithium (Li)	2021/06/04	<2.0		ug/L	
			Dissolved Manganese (Mn)	2021/06/04	<1.0		ug/L	
			Dissolved Molybdenum (Mo)	2021/06/04	<1.0		ug/L	
			Dissolved Nickel (Ni)	2021/06/04	<1.0		ug/L	
			Dissolved Selenium (Se)	2021/06/04	<0.10		ug/L	
			Dissolved Silicon (Si)	2021/06/04	<100		ug/L	
			Dissolved Silver (Ag)	2021/06/04	<0.020		ug/L	
			Dissolved Strontium (Sr)	2021/06/04	<1.0		ug/L	
			Dissolved Thallium (Tl)	2021/06/04	<0.010		ug/L	
			Dissolved Tin (Sn)	2021/06/04	<5.0		ug/L	
			Dissolved Titanium (Ti)	2021/06/04	<5.0		ug/L	
			Dissolved Uranium (U)	2021/06/04	<0.10		ug/L	
			Dissolved Vanadium (V)	2021/06/04	<5.0		ug/L	
			Dissolved Zinc (Zn)	2021/06/04	<5.0		ug/L	
			Dissolved Zirconium (Zr)	2021/06/04	<0.10		ug/L	
A245506	JLP	RPD	Dissolved Aluminum (Al)	2021/06/04	0.43		%	20
			Dissolved Antimony (Sb)	2021/06/04	NC		%	20
			Dissolved Arsenic (As)	2021/06/04	NC		%	20
			Dissolved Barium (Ba)	2021/06/04	2.2		%	20
			Dissolved Boron (B)	2021/06/04	2.2		%	20
			Dissolved Cadmium (Cd)	2021/06/04	4.3		%	20
			Dissolved Chromium (Cr)	2021/06/04	NC		%	20
			Dissolved Cobalt (Co)	2021/06/04	NC		%	20
			Dissolved Copper (Cu)	2021/06/04	14		%	20
			Dissolved Iron (Fe)	2021/06/04	0.91		%	20
			Dissolved Lead (Pb)	2021/06/04	NC		%	20
			Dissolved Manganese (Mn)	2021/06/04	0.80		%	20
			Dissolved Molybdenum (Mo)	2021/06/04	NC		%	20
			Dissolved Nickel (Ni)	2021/06/04	2.0		%	20
			Dissolved Selenium (Se)	2021/06/04	NC		%	20
			Dissolved Silver (Ag)	2021/06/04	NC		%	20
			Dissolved Vanadium (V)	2021/06/04	NC		%	20
			Dissolved Zinc (Zn)	2021/06/04	1.1		%	20
A245606	TSO	Matrix Spike	Nitrate plus Nitrite (N)	2021/06/04		NC	%	80 - 120
A245606	TSO	Spiked Blank	Nitrate plus Nitrite (N)	2021/06/04		108	%	80 - 120
A245606	TSO	Method Blank	Nitrate plus Nitrite (N)	2021/06/04	<0.0020		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A245606	TSO	RPD	Nitrate plus Nitrite (N)	2021/06/04	1.1		%	25
A245613	TSO	Matrix Spike	Nitrite (N)	2021/06/04		NC	%	80 - 120
A245613	TSO	Spiked Blank	Nitrite (N)	2021/06/04		102	%	80 - 120
A245613	TSO	Method Blank	Nitrite (N)	2021/06/04	<0.0020		mg/L	
A245613	TSO	RPD	Nitrite (N)	2021/06/04	1.1		%	25
A246973	TMU	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2021/06/08		108	%	80 - 120
A246973	TMU	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2021/06/08		110	%	80 - 120
A246973	TMU	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2021/06/08	<0.00050		mg/L	
A246973	TMU	RPD	Strong Acid Dissoc. Cyanide (CN)	2021/06/08	8.1		%	20
A247159	JC8	Matrix Spike	Dissolved Mercury (Hg)	2021/06/07		118	%	80 - 120
A247159	JC8	Spiked Blank	Dissolved Mercury (Hg)	2021/06/07		108	%	80 - 120
A247159	JC8	Method Blank	Dissolved Mercury (Hg)	2021/06/07	<0.0019		ug/L	
A247159	JC8	RPD	Dissolved Mercury (Hg)	2021/06/07	NC		%	20
A247270	BB3	Spiked Blank	pH	2021/06/04		101	%	97 - 103
A247270	BB3	RPD	pH	2021/06/04	0.15		%	N/A
A247273	BB3	Spiked Blank	Alkalinity (Total as CaCO3)	2021/06/04		93	%	80 - 120
A247273	BB3	Method Blank	Alkalinity (Total as CaCO3)	2021/06/04	<0.50		mg/L	
			Alkalinity (PP as CaCO3)	2021/06/04	<0.50		mg/L	
			Bicarbonate (HCO3)	2021/06/04	<0.50		mg/L	
			Carbonate (CO3)	2021/06/04	<0.50		mg/L	
			Hydroxide (OH)	2021/06/04	<0.50		mg/L	
A247275	BB3	Spiked Blank	Conductivity	2021/06/04		100	%	80 - 120
A247275	BB3	Method Blank	Conductivity	2021/06/04	<1.0		uS/cm	
A247362	BB3	Spiked Blank	Acidity (pH 8.3)	2021/06/04		102	%	80 - 120
A247362	BB3	Method Blank	Acidity (pH 4.5)	2021/06/04	<1.0		mg/L	
			Acidity (pH 8.3)	2021/06/04	<1.0		mg/L	
A247417	HE1	Matrix Spike	Total Dissolved Solids	2021/06/07		114	%	80 - 120
A247417	HE1	Spiked Blank	Total Dissolved Solids	2021/06/07		92	%	80 - 120
A247417	HE1	Method Blank	Total Dissolved Solids	2021/06/07	<1.0		mg/L	
A247417	HE1	RPD	Total Dissolved Solids	2021/06/07	5.3		%	20
A247457	MO5	Matrix Spike [ZX5692-01]	Dissolved Chloride (Cl)	2021/06/07		105	%	80 - 120
			Dissolved Sulphate (SO4)	2021/06/07		98	%	80 - 120
A247457	MO5	Spiked Blank	Dissolved Chloride (Cl)	2021/06/07		102	%	80 - 120
			Dissolved Sulphate (SO4)	2021/06/07		96	%	80 - 120
A247457	MO5	Method Blank	Dissolved Chloride (Cl)	2021/06/07	<0.50		mg/L	
			Dissolved Sulphate (SO4)	2021/06/07	<0.50		mg/L	
A247457	MO5	RPD [ZX5692-01]	Dissolved Chloride (Cl)	2021/06/07	NC		%	20
			Dissolved Sulphate (SO4)	2021/06/07	NC		%	20
A247462	MO5	Matrix Spike	Dissolved Chloride (Cl)	2021/06/07		100	%	80 - 120
			Dissolved Sulphate (SO4)	2021/06/07		NC	%	80 - 120
A247462	MO5	Spiked Blank	Dissolved Chloride (Cl)	2021/06/07		102	%	80 - 120
			Dissolved Sulphate (SO4)	2021/06/07		95	%	80 - 120
A247462	MO5	Method Blank	Dissolved Chloride (Cl)	2021/06/07	<0.50		mg/L	
			Dissolved Sulphate (SO4)	2021/06/07	<0.50		mg/L	
A247462	MO5	RPD	Dissolved Chloride (Cl)	2021/06/07	2.7		%	20
			Dissolved Sulphate (SO4)	2021/06/07	2.6		%	20
A247482	JC8	Matrix Spike	Total Mercury (Hg)	2021/06/07		118	%	80 - 120
A247482	JC8	Spiked Blank	Total Mercury (Hg)	2021/06/07		110	%	80 - 120
A247482	JC8	Method Blank	Total Mercury (Hg)	2021/06/07	<0.0019		ug/L	
A247482	JC8	RPD	Total Mercury (Hg)	2021/06/07	NC		%	20
A248286	BTM	Matrix Spike	Total Suspended Solids	2021/06/09		101	%	80 - 120
A248286	BTM	Spiked Blank	Total Suspended Solids	2021/06/09		103	%	80 - 120
A248286	BTM	Method Blank	Total Suspended Solids	2021/06/09	<1.0		mg/L	
A248286	BTM	RPD	Total Suspended Solids	2021/06/09	13		%	20
A248307	BTM	Matrix Spike	Total Suspended Solids	2021/06/09		105	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A248307	BTM	Spiked Blank	Total Suspended Solids	2021/06/09		102	%	80 - 120
A248307	BTM	Method Blank	Total Suspended Solids	2021/06/09	<1.0		mg/L	
A248307	BTM	RPD	Total Suspended Solids	2021/06/09	NC		%	20
A248320	TSO	Matrix Spike	Total Nitrogen (N)	2021/06/09		99	%	80 - 120
A248320	TSO	Spiked Blank	Total Nitrogen (N)	2021/06/09		102	%	80 - 120
A248320	TSO	Method Blank	Total Nitrogen (N)	2021/06/09	<0.020		mg/L	
A248320	TSO	RPD	Total Nitrogen (N)	2021/06/09	16		%	20
A248334	TSO	Matrix Spike [ZX5690-05]	Total Nitrogen (N)	2021/06/09		NC	%	80 - 120
A248334	TSO	Spiked Blank	Total Nitrogen (N)	2021/06/09		99	%	80 - 120
A248334	TSO	Method Blank	Total Nitrogen (N)	2021/06/09	<0.020		mg/L	
A248334	TSO	RPD [ZX5690-05]	Total Nitrogen (N)	2021/06/09	0.31		%	20
A248581	AA1	Matrix Spike	Total Aluminum (Al)	2021/06/09		101	%	80 - 120
			Total Antimony (Sb)	2021/06/09		99	%	80 - 120
			Total Arsenic (As)	2021/06/09		100	%	80 - 120
			Total Barium (Ba)	2021/06/09		97	%	80 - 120
			Total Beryllium (Be)	2021/06/09		96	%	80 - 120
			Total Bismuth (Bi)	2021/06/09		96	%	80 - 120
			Total Boron (B)	2021/06/09		98	%	80 - 120
			Total Cadmium (Cd)	2021/06/09		99	%	80 - 120
			Total Chromium (Cr)	2021/06/09		97	%	80 - 120
			Total Cobalt (Co)	2021/06/09		98	%	80 - 120
			Total Copper (Cu)	2021/06/09		98	%	80 - 120
			Total Iron (Fe)	2021/06/09		103	%	80 - 120
			Total Lead (Pb)	2021/06/09		97	%	80 - 120
			Total Lithium (Li)	2021/06/09		94	%	80 - 120
			Total Manganese (Mn)	2021/06/09		99	%	80 - 120
			Total Molybdenum (Mo)	2021/06/09		101	%	80 - 120
			Total Nickel (Ni)	2021/06/09		99	%	80 - 120
			Total Phosphorus (P)	2021/06/09		101	%	80 - 120
			Total Selenium (Se)	2021/06/09		102	%	80 - 120
			Total Silicon (Si)	2021/06/09		98	%	80 - 120
			Total Silver (Ag)	2021/06/09		100	%	80 - 120
			Total Strontium (Sr)	2021/06/09		99	%	80 - 120
			Total Thallium (Tl)	2021/06/09		98	%	80 - 120
			Total Tin (Sn)	2021/06/09		98	%	80 - 120
			Total Titanium (Ti)	2021/06/09		101	%	80 - 120
			Total Uranium (U)	2021/06/09		100	%	80 - 120
			Total Vanadium (V)	2021/06/09		99	%	80 - 120
			Total Zinc (Zn)	2021/06/09		99	%	80 - 120
			Total Zirconium (Zr)	2021/06/09		99	%	80 - 120
A248581	AA1	Spiked Blank	Total Aluminum (Al)	2021/06/09		108	%	80 - 120
			Total Antimony (Sb)	2021/06/09		108	%	80 - 120
			Total Arsenic (As)	2021/06/09		107	%	80 - 120
			Total Barium (Ba)	2021/06/09		106	%	80 - 120
			Total Beryllium (Be)	2021/06/09		105	%	80 - 120
			Total Bismuth (Bi)	2021/06/09		104	%	80 - 120
			Total Boron (B)	2021/06/09		105	%	80 - 120
			Total Cadmium (Cd)	2021/06/09		107	%	80 - 120
			Total Chromium (Cr)	2021/06/09		104	%	80 - 120
			Total Cobalt (Co)	2021/06/09		105	%	80 - 120
			Total Copper (Cu)	2021/06/09		104	%	80 - 120
			Total Iron (Fe)	2021/06/09		108	%	80 - 120
			Total Lead (Pb)	2021/06/09		106	%	80 - 120
			Total Lithium (Li)	2021/06/09		103	%	80 - 120
			Total Manganese (Mn)	2021/06/09		106	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Molybdenum (Mo)	2021/06/09		110	%	80 - 120
			Total Nickel (Ni)	2021/06/09		107	%	80 - 120
			Total Phosphorus (P)	2021/06/09		107	%	80 - 120
			Total Selenium (Se)	2021/06/09		106	%	80 - 120
			Total Silicon (Si)	2021/06/09		107	%	80 - 120
			Total Silver (Ag)	2021/06/09		107	%	80 - 120
			Total Strontium (Sr)	2021/06/09		107	%	80 - 120
			Total Thallium (Tl)	2021/06/09		106	%	80 - 120
			Total Tin (Sn)	2021/06/09		107	%	80 - 120
			Total Titanium (Ti)	2021/06/09		109	%	80 - 120
			Total Uranium (U)	2021/06/09		107	%	80 - 120
			Total Vanadium (V)	2021/06/09		106	%	80 - 120
			Total Zinc (Zn)	2021/06/09		108	%	80 - 120
			Total Zirconium (Zr)	2021/06/09		107	%	80 - 120
A248581	AA1	Method Blank	Total Aluminum (Al)	2021/06/09	<3.0		ug/L	
			Total Antimony (Sb)	2021/06/09	<0.50		ug/L	
			Total Arsenic (As)	2021/06/09	<0.10		ug/L	
			Total Barium (Ba)	2021/06/09	<1.0		ug/L	
			Total Beryllium (Be)	2021/06/09	<0.10		ug/L	
			Total Bismuth (Bi)	2021/06/09	<1.0		ug/L	
			Total Boron (B)	2021/06/09	<50		ug/L	
			Total Cadmium (Cd)	2021/06/09	<0.010		ug/L	
			Total Chromium (Cr)	2021/06/09	<1.0		ug/L	
			Total Cobalt (Co)	2021/06/09	<0.20		ug/L	
			Total Copper (Cu)	2021/06/09	<0.50		ug/L	
			Total Iron (Fe)	2021/06/09	<10		ug/L	
			Total Lead (Pb)	2021/06/09	<0.20		ug/L	
			Total Lithium (Li)	2021/06/09	<2.0		ug/L	
			Total Manganese (Mn)	2021/06/09	<1.0		ug/L	
			Total Molybdenum (Mo)	2021/06/09	<1.0		ug/L	
			Total Nickel (Ni)	2021/06/09	<1.0		ug/L	
			Total Phosphorus (P)	2021/06/09	<10		ug/L	
			Total Selenium (Se)	2021/06/09	<0.10		ug/L	
			Total Silicon (Si)	2021/06/09	<100		ug/L	
			Total Silver (Ag)	2021/06/09	<0.020		ug/L	
			Total Strontium (Sr)	2021/06/09	<1.0		ug/L	
			Total Thallium (Tl)	2021/06/09	<0.010		ug/L	
			Total Tin (Sn)	2021/06/09	<5.0		ug/L	
			Total Titanium (Ti)	2021/06/09	<5.0		ug/L	
			Total Uranium (U)	2021/06/09	<0.10		ug/L	
			Total Vanadium (V)	2021/06/09	<5.0		ug/L	
			Total Zinc (Zn)	2021/06/09	<5.0		ug/L	
			Total Zirconium (Zr)	2021/06/09	<0.10		ug/L	
A248581	AA1	RPD	Total Aluminum (Al)	2021/06/09	8.6		%	20
			Total Antimony (Sb)	2021/06/09	NC		%	20
			Total Arsenic (As)	2021/06/09	NC		%	20
			Total Barium (Ba)	2021/06/09	NC		%	20
			Total Beryllium (Be)	2021/06/09	NC		%	20
			Total Bismuth (Bi)	2021/06/09	NC		%	20
			Total Boron (B)	2021/06/09	NC		%	20
			Total Cadmium (Cd)	2021/06/09	NC		%	20
			Total Chromium (Cr)	2021/06/09	NC		%	20
			Total Cobalt (Co)	2021/06/09	NC		%	20
			Total Copper (Cu)	2021/06/09	0.81		%	20
			Total Iron (Fe)	2021/06/09	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Lead (Pb)	2021/06/09	0.94		%	20
			Total Lithium (Li)	2021/06/09	NC		%	20
			Total Manganese (Mn)	2021/06/09	0.46		%	20
			Total Molybdenum (Mo)	2021/06/09	NC		%	20
			Total Nickel (Ni)	2021/06/09	4.6		%	20
			Total Selenium (Se)	2021/06/09	NC		%	20
			Total Silicon (Si)	2021/06/09	NC		%	20
			Total Silver (Ag)	2021/06/09	1.6		%	20
			Total Strontium (Sr)	2021/06/09	NC		%	20
			Total Thallium (Tl)	2021/06/09	NC		%	20
			Total Tin (Sn)	2021/06/09	NC		%	20
			Total Titanium (Ti)	2021/06/09	NC		%	20
			Total Uranium (U)	2021/06/09	NC		%	20
			Total Vanadium (V)	2021/06/09	NC		%	20
			Total Zinc (Zn)	2021/06/09	0.53		%	20
			Total Zirconium (Zr)	2021/06/09	NC		%	20
			Total Aluminum (Al)	2021/06/09	NC		%	20
			Total Antimony (Sb)	2021/06/09	NC		%	20
			Total Arsenic (As)	2021/06/09	NC		%	20
			Total Barium (Ba)	2021/06/09	NC		%	20
			Total Beryllium (Be)	2021/06/09	NC		%	20
			Total Bismuth (Bi)	2021/06/09	NC		%	20
			Total Boron (B)	2021/06/09	NC		%	20
			Total Cadmium (Cd)	2021/06/09	NC		%	20
			Total Chromium (Cr)	2021/06/09	NC		%	20
			Total Cobalt (Co)	2021/06/09	NC		%	20
			Total Copper (Cu)	2021/06/09	NC		%	20
			Total Iron (Fe)	2021/06/09	NC		%	20
			Total Lead (Pb)	2021/06/09	NC		%	20
			Total Lithium (Li)	2021/06/09	NC		%	20
			Total Manganese (Mn)	2021/06/09	NC		%	20
			Total Molybdenum (Mo)	2021/06/09	NC		%	20
			Total Nickel (Ni)	2021/06/09	NC		%	20
			Total Selenium (Se)	2021/06/09	NC		%	20
			Total Silicon (Si)	2021/06/09	NC		%	20
			Total Silver (Ag)	2021/06/09	NC		%	20
			Total Strontium (Sr)	2021/06/09	NC		%	20
			Total Thallium (Tl)	2021/06/09	NC		%	20
			Total Tin (Sn)	2021/06/09	NC		%	20
			Total Titanium (Ti)	2021/06/09	NC		%	20
			Total Uranium (U)	2021/06/09	NC		%	20
			Total Vanadium (V)	2021/06/09	NC		%	20
			Total Zinc (Zn)	2021/06/09	NC		%	20
			Total Zirconium (Zr)	2021/06/09	NC		%	20
			Total Aluminum (Al)	2021/06/09	NC		%	20
			Total Antimony (Sb)	2021/06/09	NC		%	20
			Total Arsenic (As)	2021/06/09	NC		%	20
			Total Barium (Ba)	2021/06/09	NC		%	20
			Total Beryllium (Be)	2021/06/09	NC		%	20
			Total Bismuth (Bi)	2021/06/09	NC		%	20
			Total Boron (B)	2021/06/09	NC		%	20
			Total Cadmium (Cd)	2021/06/09	NC		%	20
			Total Chromium (Cr)	2021/06/09	2.4		%	20
			Total Cobalt (Co)	2021/06/09	NC		%	20
			Total Copper (Cu)	2021/06/09	NC		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Iron (Fe)	2021/06/09	NC		%	20
			Total Lead (Pb)	2021/06/09	NC		%	20
			Total Lithium (Li)	2021/06/09	NC		%	20
			Total Manganese (Mn)	2021/06/09	NC		%	20
			Total Molybdenum (Mo)	2021/06/09	NC		%	20
			Total Nickel (Ni)	2021/06/09	NC		%	20
			Total Phosphorus (P)	2021/06/09	NC		%	20
			Total Selenium (Se)	2021/06/09	NC		%	20
			Total Silicon (Si)	2021/06/09	NC		%	20
			Total Silver (Ag)	2021/06/09	NC		%	20
			Total Strontium (Sr)	2021/06/09	NC		%	20
			Total Thallium (Tl)	2021/06/09	NC		%	20
			Total Tin (Sn)	2021/06/09	NC		%	20
			Total Titanium (Ti)	2021/06/09	NC		%	20
			Total Uranium (U)	2021/06/09	NC		%	20
			Total Vanadium (V)	2021/06/09	NC		%	20
			Total Zinc (Zn)	2021/06/09	NC		%	20
			Total Zirconium (Zr)	2021/06/09	NC		%	20
A248581	AA1	RPD [ZX5692-03]	Total Aluminum (Al)	2021/06/09	NC		%	20
			Total Antimony (Sb)	2021/06/09	NC		%	20
			Total Arsenic (As)	2021/06/09	NC		%	20
			Total Barium (Ba)	2021/06/09	NC		%	20
			Total Beryllium (Be)	2021/06/09	NC		%	20
			Total Bismuth (Bi)	2021/06/09	NC		%	20
			Total Boron (B)	2021/06/09	NC		%	20
			Total Cadmium (Cd)	2021/06/09	NC		%	20
			Total Chromium (Cr)	2021/06/09	NC		%	20
			Total Cobalt (Co)	2021/06/09	NC		%	20
			Total Copper (Cu)	2021/06/09	NC		%	20
			Total Iron (Fe)	2021/06/09	NC		%	20
			Total Lead (Pb)	2021/06/09	NC		%	20
			Total Lithium (Li)	2021/06/09	NC		%	20
			Total Manganese (Mn)	2021/06/09	NC		%	20
			Total Molybdenum (Mo)	2021/06/09	NC		%	20
			Total Nickel (Ni)	2021/06/09	NC		%	20
			Total Phosphorus (P)	2021/06/09	NC		%	20
			Total Selenium (Se)	2021/06/09	NC		%	20
			Total Silicon (Si)	2021/06/09	NC		%	20
			Total Silver (Ag)	2021/06/09	NC		%	20
			Total Strontium (Sr)	2021/06/09	NC		%	20
			Total Thallium (Tl)	2021/06/09	NC		%	20
			Total Tin (Sn)	2021/06/09	NC		%	20
			Total Titanium (Ti)	2021/06/09	NC		%	20
			Total Uranium (U)	2021/06/09	NC		%	20
			Total Vanadium (V)	2021/06/09	NC		%	20
			Total Zinc (Zn)	2021/06/09	NC		%	20
			Total Zirconium (Zr)	2021/06/09	NC		%	20
A248655	JLP	Matrix Spike	Total Aluminum (Al)	2021/06/09		96	%	80 - 120
			Total Antimony (Sb)	2021/06/09		103	%	80 - 120
			Total Arsenic (As)	2021/06/09		104	%	80 - 120
			Total Barium (Ba)	2021/06/09		104	%	80 - 120
			Total Beryllium (Be)	2021/06/09		94	%	80 - 120
			Total Bismuth (Bi)	2021/06/09		100	%	80 - 120
			Total Boron (B)	2021/06/09		NC	%	80 - 120
			Total Cadmium (Cd)	2021/06/09		97	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Chromium (Cr)	2021/06/09		88	%	80 - 120
			Total Cobalt (Co)	2021/06/09		87	%	80 - 120
			Total Copper (Cu)	2021/06/09		81	%	80 - 120
			Total Iron (Fe)	2021/06/09		NC	%	80 - 120
			Total Lead (Pb)	2021/06/09		104	%	80 - 120
			Total Lithium (Li)	2021/06/09		102	%	80 - 120
			Total Manganese (Mn)	2021/06/09		NC	%	80 - 120
			Total Molybdenum (Mo)	2021/06/09		112	%	80 - 120
			Total Nickel (Ni)	2021/06/09		84	%	80 - 120
			Total Phosphorus (P)	2021/06/09		99	%	80 - 120
			Total Selenium (Se)	2021/06/09		94	%	80 - 120
			Total Silicon (Si)	2021/06/09		113	%	80 - 120
			Total Silver (Ag)	2021/06/09		94	%	80 - 120
			Total Strontium (Sr)	2021/06/09		NC	%	80 - 120
			Total Thallium (Tl)	2021/06/09		103	%	80 - 120
			Total Tin (Sn)	2021/06/09		97	%	80 - 120
			Total Titanium (Ti)	2021/06/09		97	%	80 - 120
			Total Uranium (U)	2021/06/09		110	%	80 - 120
			Total Vanadium (V)	2021/06/09		95	%	80 - 120
			Total Zinc (Zn)	2021/06/09		NC	%	80 - 120
			Total Zirconium (Zr)	2021/06/09		107	%	80 - 120
A248655	JLP	Spiked Blank	Total Aluminum (Al)	2021/06/09		100	%	80 - 120
			Total Antimony (Sb)	2021/06/09		101	%	80 - 120
			Total Arsenic (As)	2021/06/09		98	%	80 - 120
			Total Barium (Ba)	2021/06/09		100	%	80 - 120
			Total Beryllium (Be)	2021/06/09		92	%	80 - 120
			Total Bismuth (Bi)	2021/06/09		102	%	80 - 120
			Total Boron (B)	2021/06/09		92	%	80 - 120
			Total Cadmium (Cd)	2021/06/09		97	%	80 - 120
			Total Chromium (Cr)	2021/06/09		96	%	80 - 120
			Total Cobalt (Co)	2021/06/09		97	%	80 - 120
			Total Copper (Cu)	2021/06/09		91	%	80 - 120
			Total Iron (Fe)	2021/06/09		101	%	80 - 120
			Total Lead (Pb)	2021/06/09		106	%	80 - 120
			Total Lithium (Li)	2021/06/09		95	%	80 - 120
			Total Manganese (Mn)	2021/06/09		97	%	80 - 120
			Total Molybdenum (Mo)	2021/06/09		100	%	80 - 120
			Total Nickel (Ni)	2021/06/09		93	%	80 - 120
			Total Phosphorus (P)	2021/06/09		99	%	80 - 120
			Total Selenium (Se)	2021/06/09		94	%	80 - 120
			Total Silicon (Si)	2021/06/09		104	%	80 - 120
			Total Silver (Ag)	2021/06/09		96	%	80 - 120
			Total Strontium (Sr)	2021/06/09		103	%	80 - 120
			Total Thallium (Tl)	2021/06/09		102	%	80 - 120
			Total Tin (Sn)	2021/06/09		98	%	80 - 120
			Total Titanium (Ti)	2021/06/09		99	%	80 - 120
			Total Uranium (U)	2021/06/09		105	%	80 - 120
			Total Vanadium (V)	2021/06/09		98	%	80 - 120
			Total Zinc (Zn)	2021/06/09		97	%	80 - 120
			Total Zirconium (Zr)	2021/06/09		98	%	80 - 120
A248655	JLP	Method Blank	Total Aluminum (Al)	2021/06/09	<3.0		ug/L	
			Total Antimony (Sb)	2021/06/09	<0.50		ug/L	
			Total Arsenic (As)	2021/06/09	<0.10		ug/L	
			Total Barium (Ba)	2021/06/09	<1.0		ug/L	
			Total Beryllium (Be)	2021/06/09	<0.10		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Bismuth (Bi)	2021/06/09	<1.0		ug/L	
			Total Boron (B)	2021/06/09	<50		ug/L	
			Total Cadmium (Cd)	2021/06/09	<0.010		ug/L	
			Total Chromium (Cr)	2021/06/09	<1.0		ug/L	
			Total Cobalt (Co)	2021/06/09	<0.20		ug/L	
			Total Copper (Cu)	2021/06/09	<0.50		ug/L	
			Total Iron (Fe)	2021/06/09	<10		ug/L	
			Total Lead (Pb)	2021/06/09	<0.20		ug/L	
			Total Lithium (Li)	2021/06/09	<2.0		ug/L	
			Total Manganese (Mn)	2021/06/09	<1.0		ug/L	
			Total Molybdenum (Mo)	2021/06/09	<1.0		ug/L	
			Total Nickel (Ni)	2021/06/09	<1.0		ug/L	
			Total Phosphorus (P)	2021/06/09	<10		ug/L	
			Total Selenium (Se)	2021/06/09	<0.10		ug/L	
			Total Silicon (Si)	2021/06/09	<100		ug/L	
			Total Silver (Ag)	2021/06/09	<0.020		ug/L	
			Total Strontium (Sr)	2021/06/09	<1.0		ug/L	
			Total Thallium (Tl)	2021/06/09	<0.010		ug/L	
			Total Tin (Sn)	2021/06/09	<5.0		ug/L	
			Total Titanium (Ti)	2021/06/09	<5.0		ug/L	
			Total Uranium (U)	2021/06/09	<0.10		ug/L	
			Total Vanadium (V)	2021/06/09	<5.0		ug/L	
			Total Zinc (Zn)	2021/06/09	<5.0		ug/L	
			Total Zirconium (Zr)	2021/06/09	<0.10		ug/L	
A248655	JLP	RPD	Total Aluminum (Al)	2021/06/09	NC		%	20
			Total Antimony (Sb)	2021/06/09	NC		%	20
			Total Arsenic (As)	2021/06/09	2.5		%	20
			Total Barium (Ba)	2021/06/09	1.6		%	20
			Total Beryllium (Be)	2021/06/09	NC		%	20
			Total Bismuth (Bi)	2021/06/09	NC		%	20
			Total Boron (B)	2021/06/09	6.5		%	20
			Total Cadmium (Cd)	2021/06/09	8.0		%	20
			Total Chromium (Cr)	2021/06/09	NC		%	20
			Total Cobalt (Co)	2021/06/09	3.5		%	20
			Total Copper (Cu)	2021/06/09	8.7		%	20
			Total Iron (Fe)	2021/06/09	4.0		%	20
			Total Lead (Pb)	2021/06/09	2.8		%	20
			Total Lithium (Li)	2021/06/09	5.5		%	20
			Total Manganese (Mn)	2021/06/09	5.1		%	20
			Total Molybdenum (Mo)	2021/06/09	NC		%	20
			Total Nickel (Ni)	2021/06/09	2.9		%	20
			Total Selenium (Se)	2021/06/09	NC		%	20
			Total Silicon (Si)	2021/06/09	2.4		%	20
			Total Silver (Ag)	2021/06/09	NC		%	20
			Total Strontium (Sr)	2021/06/09	1.8		%	20
			Total Thallium (Tl)	2021/06/09	NC		%	20
			Total Tin (Sn)	2021/06/09	NC		%	20
			Total Titanium (Ti)	2021/06/09	NC		%	20
			Total Uranium (U)	2021/06/09	NC		%	20
			Total Vanadium (V)	2021/06/09	NC		%	20
			Total Zinc (Zn)	2021/06/09	2.7		%	20
			Total Zirconium (Zr)	2021/06/09	NC		%	20
A250207	LDH	Matrix Spike [ZX5688-01]	Fluoride (F)	2021/06/09		114	%	80 - 120
A250207	LDH	Spiked Blank	Fluoride (F)	2021/06/09		104	%	80 - 120
A250207	LDH	Method Blank	Fluoride (F)	2021/06/09	<0.010		mg/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A250207	LDH	RPD [ZX5688-01]	Fluoride (F)	2021/06/09	0		%	20
A250497	ZWU	Matrix Spike	Total Organic Carbon (C)	2021/06/10		105	%	80 - 120
A250497	ZWU	Spiked Blank	Total Organic Carbon (C)	2021/06/10		102	%	80 - 120
A250497	ZWU	Method Blank	Total Organic Carbon (C)	2021/06/10	<0.50		mg/L	
A250497	ZWU	RPD	Total Organic Carbon (C)	2021/06/10	NC		%	20
A250499	ZWU	Matrix Spike [ZX5691-05]	Total Organic Carbon (C)	2021/06/10		NC	%	80 - 120
A250499	ZWU	Spiked Blank	Total Organic Carbon (C)	2021/06/10		102	%	80 - 120
A250499	ZWU	Method Blank	Total Organic Carbon (C)	2021/06/10	<0.50		mg/L	
A250499	ZWU	RPD [ZX5691-05]	Total Organic Carbon (C)	2021/06/10	4.1		%	20
A250529	STI	Matrix Spike	Total Phosphorus (P)	2021/06/10		90	%	80 - 120
A250529	STI	QC Standard	Total Phosphorus (P)	2021/06/10		86	%	80 - 120
A250529	STI	Spiked Blank	Total Phosphorus (P)	2021/06/10		100	%	80 - 120
A250529	STI	Method Blank	Total Phosphorus (P)	2021/06/10	<0.0030		mg/L	
A250529	STI	RPD	Total Phosphorus (P)	2021/06/10	NC		%	20
A250893	NR	Matrix Spike	Total Ammonia (N)	2021/06/10		107	%	80 - 120
A250893	NR	Spiked Blank	Total Ammonia (N)	2021/06/10		98	%	80 - 120
A250893	NR	Method Blank	Total Ammonia (N)	2021/06/10	<0.0050		mg/L	
A250893	NR	RPD	Total Ammonia (N)	2021/06/10	NC		%	20
A251523	SKM	Matrix Spike [ZX5692-06]	Total Ammonia (N)	2021/06/10		100	%	80 - 120
A251523	SKM	Spiked Blank	Total Ammonia (N)	2021/06/10		98	%	80 - 120
A251523	SKM	Method Blank	Total Ammonia (N)	2021/06/10	<0.0050		mg/L	
A251523	SKM	RPD [ZX5692-06]	Total Ammonia (N)	2021/06/10	1.8		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WR2201094**	Page	: 1 of 12
Client	: **Ensero Solutions Canada**	Laboratory	: Whitehorse - Environmental
Contact	: Rachel Martz	Account Manager	: Heather McKenzie
Address	: #3 Calcite Business Centre 151 Industrial Road Whitehorse YT Canada Y1A 2V3	Address	: #12 151 Industrial Road Whitehorse YT Canada Y1A 2V3
Telephone	: 306 978 3111	Telephone	: +1 867 668 6689
Project	: GCC	Date Samples Received	: 15-Sep-2022 10:47
PO	: ----	Date Analysis Commenced	: 20-Sep-2022
C-O-C number	: ----	Issue Date	: 29-Sep-2022 16:29
Sampler	: FS		
Site	: 2022 Pricing		
Quote number	: VA22-CAEG100-001		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
DTMF	*Dissolved concentration exceeds total for field-filtered metals sample. Metallic contaminants may have been introduced to dissolved sample during field filtration.*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1	W2	W3	W4	W5
					Client sampling date / time	13-Sep-2022 16:55	13-Sep-2022 16:15	13-Sep-2022 15:10	13-Sep-2022 14:30	14-Sep-2022 08:45
						WR2201094-001	WR2201094-002	WR2201094-003	WR2201094-004	WR2201094-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		135	115	151	120	81.4
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		135	115	151	120	81.4
conductivity	----	E100	2.0	µS/cm		421	277	315	270	168
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		207	135	165	138	83.2
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.50	mg/L		212	138	172	137	88.5
pH	----	E108	0.10	pH units		8.14	8.16	8.07	8.18	7.71
solids, total dissolved [TDS]	----	E162	10	mg/L		306	219	249	220	158
solids, total suspended [TSS]	----	E160-L	1.0	mg/L		<1.0	22.0	8.2	13.6	6.4
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	0.0130	0.0057	0.0145	0.0086
bromide	24959-67-9	E235.Br-L	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
chloride	16887-00-6	E235.Cl	0.50	mg/L		2.06	1.25	0.79	0.74	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.684	0.261	0.189	0.243	0.128
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.235	0.0185	0.0086	0.0150	<0.0050
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		90.5	27.9	18.2	25.0	6.43
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		3.67	17.0	17.1	18.2	23.5
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		3.20	17.5	16.6	20.0	23.6
Ion Balance										
anion sum	----	EC101A	0.10	meq/L		4.69	2.93	3.43	2.95	1.77
cation sum (total)	----	EC101A	0.10	meq/L		4.68	3.24	3.79	3.18	2.21
ion balance (APHA)	----	EC101A	0.010	%		0.107	5.02	4.99	3.75	11.0
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L		0.0039	0.192	0.0981	0.142	0.0468
antimony, total	7440-36-0	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	0.00024
arsenic, total	7440-38-2	E420	0.00010	mg/L		<0.00010	0.00069	0.00055	0.00064	0.00220

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1	W2	W3	W4	W5
					Client sampling date / time	13-Sep-2022 16:55	13-Sep-2022 16:15	13-Sep-2022 15:10	13-Sep-2022 14:30	14-Sep-2022 08:45
						WR2201094-001	WR2201094-002	WR2201094-003	WR2201094-004	WR2201094-005
						Result	Result	Result	Result	Result
Total Metals										
barium, total	7440-39-3	E420	0.00010	mg/L		0.0592	0.0433	0.0515	0.0427	0.0386
beryllium, total	7440-41-7	E420	0.000100	mg/L		<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
bismuth, total	7440-69-9	E420	0.000050	mg/L		<0.000050	<0.000050	<0.000050	0.000095	0.000354
boron, total	7440-42-8	E420	0.010	mg/L		0.011	<0.010	<0.010	<0.010	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L		<0.0000100 DLM	0.0000072	0.0000074	0.0000093	0.0000085
calcium, total	7440-70-2	E420	0.050	mg/L		63.1	38.5	54.0	38.8	26.0
chromium, total	7440-47-3	E420	0.00050	mg/L		<0.00050	0.00058	<0.00050	<0.00050	0.00060
cobalt, total	7440-48-4	E420	0.00010	mg/L		<0.00010	0.00020	0.00012	0.00020	0.00018
copper, total	7440-50-8	E420	0.00050	mg/L		<0.00050	0.00139	0.00159	0.00184	0.00242
iron, total	7439-89-6	E420	0.010	mg/L		<0.010	0.559	0.282	0.453	4.68
lead, total	7439-92-1	E420	0.000050	mg/L		<0.000050	0.000064	<0.000050	0.000069	0.000126
lithium, total	7439-93-2	E420	0.0010	mg/L		<0.0010	0.0011	0.0011	0.0011	<0.0010
magnesium, total	7439-95-4	E420	0.100	mg/L		13.3	10.2	9.10	9.68	5.73
manganese, total	7439-96-5	E420	0.00010	mg/L		0.00037	0.0491	0.123	0.0432	0.0961
mercury, total	7439-97-6	E508	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L		0.0221	0.00242	0.00117	0.00209	0.000195
nickel, total	7440-02-0	E420	0.00050	mg/L		<0.00050	0.00086	0.00075	0.00095	0.00143
phosphorus, total	7723-14-0	E420	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	0.110
potassium, total	7440-09-7	E420	0.100	mg/L		1.09	0.636	0.538	0.633	0.462
selenium, total	7782-49-2	E420	0.000050	mg/L		0.000231	0.000093	0.000091	0.000116	0.000082
silicon, total	7440-21-3	E420	0.10	mg/L		6.44	8.84	8.50	8.65	10.3
silver, total	7440-22-4	E420	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, total	7440-23-5	E420	0.050	mg/L		9.36	9.66	6.99	9.03	5.89
strontium, total	7440-24-6	E420	0.00020	mg/L		0.752	0.339	0.459	0.332	0.157
sulfur, total	7704-34-9	E420	0.50	mg/L		30.8	9.61	6.18	8.60	2.10
thallium, total	7440-28-0	E420	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
tin, total	7440-31-5	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L		<0.00030	0.00770	0.00392	0.00593	0.00163
uranium, total	7440-61-1	E420	0.000010	mg/L		0.000870	0.000418	0.000240	0.000371	0.000032
vanadium, total	7440-62-2	E420	0.00050	mg/L		0.00124	0.00158	0.00110	0.00142	0.00116
zinc, total	7440-66-6	E420	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	0.0074

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1	W2	W3	W4	W5
					Client sampling date / time	13-Sep-2022 16:55	13-Sep-2022 16:15	13-Sep-2022 15:10	13-Sep-2022 14:30	14-Sep-2022 08:45
						WR2201094-001	WR2201094-002	WR2201094-003	WR2201094-004	WR2201094-005
						Result	Result	Result	Result	Result
Total Metals										
zirconium, total	7440-67-7	E420	0.00020	mg/L		<0.00020	0.00029	0.00022	0.00032	0.00045
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0020	0.0415	0.0097	0.0294	0.0360
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00015	0.00068	0.00053	0.00063	0.00079
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0646	0.0429	0.0494	0.0422	0.0261
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L		<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	0.000348 DTMF	0.000082	0.000374 DTC	0.000211
boron, dissolved	7440-42-8	E421	0.010	mg/L		0.011	<0.010	<0.010	<0.010	<0.010
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		<0.0000050	0.0000067	<0.0000050	0.0000092	0.0000236 DTMF
calcium, dissolved	7440-70-2	E421	0.050	mg/L		61.0	37.0	51.3	39.1	23.7
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		<0.00010	0.00013	<0.00010	0.00015	0.00018
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00023	0.00199	0.00171	0.00245 DTC	0.00190
iron, dissolved	7439-89-6	E421	0.010	mg/L		<0.010	0.323	0.086	0.265	1.31
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	0.000076	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
magnesium, dissolved	7439-95-4	E421	0.100	mg/L		13.4	10.4	9.01	9.92	5.83
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		0.00031	0.0418	0.0547	0.0358	0.122
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.0214	0.00233	0.00112	0.00201	0.000137
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		<0.00050	0.00092	0.00078	0.00106	0.00110
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.100	mg/L		1.26	0.868 DTMF	0.629	0.838	0.357
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000156	0.000057	0.000068	0.000087	0.000052
silicon, dissolved	7440-21-3	E421	0.050	mg/L		6.20	8.35	8.18	8.28	9.99
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L		9.62	9.92	6.90	9.27	5.71
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.734	0.334	0.444	0.329	0.140
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		27.8	8.92	5.93	7.81	2.57
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Analytical Results

Sub-Matrix: **Water** (Matrix: **Water**)					Client sample ID	W1	W2	W3	W4	W5
					Client sampling date / time	13-Sep-2022 16:55	13-Sep-2022 16:15	13-Sep-2022 15:10	13-Sep-2022 14:30	14-Sep-2022 08:45
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*		**WR2201094-001**	**WR2201094-002**	**WR2201094-003**	**WR2201094-004**	**WR2201094-005**
						Result	Result	Result	Result	Result
Dissolved Metals										
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	0.00016	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		<0.00030	0.00158	0.00040	0.00086	0.00089
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.000891	0.000426	0.000243	0.000381	0.000026
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		0.00120	0.00101	0.00065	0.00100	0.00056
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		<0.0010	0.0022	0.0010	0.0046 DTC	0.0018
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		<0.00030	0.00030	<0.00030	0.00033	0.00039
dissolved mercury filtration location	----	EP509	-	-		Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W6	W7	W9	Dup	FB
					Client sampling date / time	13-Sep-2022 17:50	14-Sep-2022 09:45	14-Sep-2022 10:55	14-Sep-2022	14-Sep-2022 10:55
						WR2201094-006	WR2201094-007	WR2201094-008	WR2201094-009	WR2201094-010
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		118	111	136	116	<1.0
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		118	111	136	116	<1.0
conductivity	----	E100	2.0	µS/cm		273	239	288	247	<2.0
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		134	124	137	126	<0.50
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.50	mg/L		137	126	143	130	<0.50
pH	----	E108	0.10	pH units		8.17	8.03	8.20	8.08	5.46
solids, total dissolved [TDS]	----	E162	10	mg/L		217	200	218	205	<10
solids, total suspended [TSS]	----	E160-L	1.0	mg/L		45.0	2.4	<1.0	<1.0	<1.0
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0281	0.0137	0.0099	0.0322	<0.0050
bromide	24959-67-9	E235.Br-L	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
chloride	16887-00-6	E235.Cl	0.50	mg/L		0.84	<0.50	0.58	<0.50	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.254	0.204	0.244	0.216	<0.020
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0167	<0.0050	<0.0050	<0.0050	<0.0050
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		0.0014	<0.0010	<0.0010	<0.0010	<0.0010
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		27.6	14.8	18.3	14.4	<0.30
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		17.5	22.0	16.6	20.7	<0.50
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		19.0	21.4	15.8	21.2	<0.50
Ion Balance										
anion sum	----	EC101A	0.10	meq/L		2.97	2.54	3.13	2.63	<0.10
cation sum (total)	----	EC101A	0.10	meq/L		3.24	2.84	3.41	2.92	<0.10
ion balance (APHA)	----	EC101A	0.010	%		4.35	5.58	4.28	5.22	<0.010
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L		0.208	0.0518	0.0178	0.0362	<0.0030
antimony, total	7440-36-0	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, total	7440-38-2	E420	0.00010	mg/L		0.00071	0.00048	0.00052	0.00049	<0.00010
barium, total	7440-39-3	E420	0.00010	mg/L		0.0439	0.0458	0.0431	0.0436	0.00016 RRV

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W6	W7	W9	Dup	FB
					Client sampling date / time	13-Sep-2022 17:50	14-Sep-2022 09:45	14-Sep-2022 10:55	14-Sep-2022	14-Sep-2022 10:55
						WR2201094-006	WR2201094-007	WR2201094-008	WR2201094-009	WR2201094-010
						Result	Result	Result	Result	Result
Total Metals										
beryllium, total	7440-41-7	E420	0.000100	mg/L		<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
bismuth, total	7440-69-9	E420	0.000050	mg/L		<0.000050	0.000676	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L		0.0000076	0.0000393	0.0000050	0.0000058	<0.0000050
calcium, total	7440-70-2	E420	0.050	mg/L		38.0	38.4	38.6	40.0	<0.050
chromium, total	7440-47-3	E420	0.00050	mg/L		0.00051	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L		0.00020	0.00013	<0.00010	0.00011	<0.00010
copper, total	7440-50-8	E420	0.00050	mg/L		0.00151	0.00453	0.00104	0.00135	<0.00050
iron, total	7439-89-6	E420	0.010	mg/L		0.512	0.218	0.210	0.201	<0.010
lead, total	7439-92-1	E420	0.000050	mg/L		0.000074	0.000063	<0.000050	<0.000050	<0.000050
lithium, total	7439-93-2	E420	0.0010	mg/L		0.0011	<0.0010	0.0015	<0.0010	<0.0010
magnesium, total	7439-95-4	E420	0.100	mg/L		10.3	7.33	11.4	7.41	<0.100
manganese, total	7439-96-5	E420	0.00010	mg/L		0.0442	0.0340	0.0132	0.0334	<0.00010
mercury, total	7439-97-6	E508	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E420	0.000050	mg/L		0.00196	0.00116	0.000427	0.00121	0.000095 RRV
nickel, total	7440-02-0	E420	0.00050	mg/L		0.00080	0.00098	0.00058	0.00087	<0.00050
phosphorus, total	7723-14-0	E420	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E420	0.100	mg/L		0.702	0.348	0.727	0.220	<0.100
selenium, total	7782-49-2	E420	0.000050	mg/L		0.000105	0.000127	0.000053	0.000113	<0.000050
silicon, total	7440-21-3	E420	0.10	mg/L		8.44	9.10	7.86	9.02	<0.10
silver, total	7440-22-4	E420	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, total	7440-23-5	E420	0.050	mg/L		10.1	6.84	11.8	6.81	<0.050
strontium, total	7440-24-6	E420	0.00020	mg/L		0.334	0.177	0.365	0.181	<0.00020
sulfur, total	7704-34-9	E420	0.50	mg/L		8.60	5.03	6.16	4.96	<0.50
thallium, total	7440-28-0	E420	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
tin, total	7440-31-5	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L		0.00916	0.00306	0.00078	<0.00090 DLM	<0.00030
uranium, total	7440-61-1	E420	0.000010	mg/L		0.000446	0.000076	0.000616	0.000076	<0.000010
vanadium, total	7440-62-2	E420	0.00050	mg/L		0.00162	0.00078	0.00060	0.00070	<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L		<0.0030	0.0044	<0.0030	<0.0030	<0.0030
zirconium, total	7440-67-7	E420	0.00020	mg/L		0.00026	0.00028	0.00024	0.00027	<0.00020

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W6	W7	W9	Dup	FB
					Client sampling date / time	13-Sep-2022 17:50	14-Sep-2022 09:45	14-Sep-2022 10:55	14-Sep-2022	14-Sep-2022 10:55
						WR2201094-006	WR2201094-007	WR2201094-008	WR2201094-009	WR2201094-010
						Result	Result	Result	Result	Result
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0202	0.0236	0.0255 DTC	0.0253	0.0019 RRV
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00070	0.00051	0.00060	0.00052	<0.00010
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0417	0.0449	0.0431	0.0466	0.00022 RRV
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L		<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	0.000088	0.000169 DTC	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		<0.0000050	0.0000060	<0.0000050	<0.0000050	<0.0000050
calcium, dissolved	7440-70-2	E421	0.050	mg/L		36.7	37.5	35.4	37.8	<0.050
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		0.00065	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00012	0.00010	<0.00010	0.00011	<0.00010
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00126	0.00139	0.00091	0.00143	<0.00020
iron, dissolved	7439-89-6	E421	0.010	mg/L		0.274	0.152	0.218	0.178	<0.010
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		<0.0010	<0.0010	0.0015	<0.0010	<0.0010
magnesium, dissolved	7439-95-4	E421	0.100	mg/L		10.2	7.26	11.8	7.66	<0.100
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		0.0502	0.0260	0.0121	0.0325	<0.00010
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.00191	0.00115	0.000404	0.00118	0.000078 RRV
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00080	0.00097	0.00065	0.00096	<0.00050
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.100	mg/L		0.753	0.272	0.741	0.286	<0.100
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000095	0.000093	0.000078	0.000127	<0.000050
silicon, dissolved	7440-21-3	E421	0.050	mg/L		8.06	9.03	7.47	9.28	<0.050
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L		10.0	6.51	11.2	6.90	<0.050
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.318	0.170	0.337	0.174	<0.00020
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		8.76	4.84	6.29	4.89	<0.50
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00074	0.00071	0.00049	0.00066	<0.00030

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: W6	W7	W9	Dup	FB
					Client sampling date / time: 13-Sep-2022 17:50	14-Sep-2022 09:45	14-Sep-2022 10:55	14-Sep-2022	14-Sep-2022 10:55
					WR2201094-006	WR2201094-007	WR2201094-008	WR2201094-009	WR2201094-010
					Result	Result	Result	Result	Result
Dissolved Metals									
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000423	0.000074	0.000621	0.000079	<0.000010
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00085	0.00058	0.00053	0.00060	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	0.0013	<0.0010	<0.0010	<0.0010
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	TB	----	----	----	----
					Client sampling date / time	12-Sep-2022	----	----	----	----
						WR2201094-011	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
conductivity	----	E100	2.0	µS/cm		<2.0	----	----	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.50	mg/L		<0.50	----	----	----	----
pH	----	E108	0.10	pH units		5.46	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		<10	----	----	----	----
solids, total suspended [TSS]	----	E160-L	1.0	mg/L		<1.0	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L		<0.050	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		<0.020	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		<0.0050	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		<0.30	----	----	----	----
Organic / Inorganic Carbon										
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		<0.50	----	----	----	----
Ion Balance										
anion sum	----	EC101A	0.10	meq/L		<0.10	----	----	----	----
cation sum (total)	----	EC101A	0.10	meq/L		<0.10	----	----	----	----
ion balance (APHA)	----	EC101A	0.010	%		<0.010	----	----	----	----
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L		0.0167 RRV	----	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L		<0.00010	----	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L		<0.00010	----	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L		0.00054 RRV	----	----	----	----
beryllium, total	7440-41-7	E420	0.000100	mg/L		<0.000100	----	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L		<0.000050	----	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L		<0.010	----	----	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	TB	----	----	----	----
					Client sampling date / time	12-Sep-2022	----	----	----	----
						WR2201094-011	--------	--------	--------	--------
						Result	----	----	----	----
Total Metals										
cadmium, total	7440-43-9	E420	0.0000050	mg/L		<0.0000050	----	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L		<0.050	----	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L		<0.00050	----	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L		<0.00010	----	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L		<0.00050	----	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L		<0.010	----	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L		<0.000050	----	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L		<0.0010	----	----	----	----
magnesium, total	7439-95-4	E420	0.100	mg/L		<0.100	----	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L		<0.00010	----	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L		<0.0000050	----	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L		<0.000050	----	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L		<0.00050	----	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L		<0.050	----	----	----	----
potassium, total	7440-09-7	E420	0.100	mg/L		<0.100	----	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L		<0.000050	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L		<0.10	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L		<0.000010	----	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L		<0.050	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L		<0.00020	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L		<0.50	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L		<0.000010	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L		<0.00010	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L		<0.00030	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L		<0.000010	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L		<0.00050	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L		0.0047 RRV	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L		<0.00020	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WR2201094**	Page	: 1 of 29
Client	: **Ensero Solutions Canada**	Laboratory	: Whitehorse - Environmental
Contact	: Rachel Martz	Account Manager	: Heather McKenzie
Address	: #3 Calcite Business Centre 151 Industrial Road Whitehorse YT Canada Y1A 2V3	Address	: #12 151 Industrial Road Whitehorse, Yukon Canada Y1A 2V3
Telephone	: 306 978 3111	Telephone	: +1 867 668 6689
Project	: GCC	Date Samples Received	: 15-Sep-2022 10:47
PO	: ----	Issue Date	: 29-Sep-2022 16:29
C-O-C number	: ----		
Sampler	: FS		
Site	: 2022 Pricing		
Quote number	: VA22-CAEG100-001		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
TB	E298	12-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
Dup	E298	14-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
FB	E298	14-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W5	E298	14-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W7	E298	14-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W9	E298	14-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W1	E298	13-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W2	E298	13-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W3	E298	13-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W4	E298	13-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W6	E298	13-Sep-2022	20-Sep-2022	----	----		22-Sep-2022	28 days	9 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
Dup	E235.Br-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
FB	E235.Br-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
W5	E235.Br-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
W7	E235.Br-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
W9	E235.Br-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE W1	E235.Br-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE W2	E235.Br-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE W3	E235.Br-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE W4	E235.Br-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE W6	E235.Br-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE TB	E235.Br-L	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Dup	E235.Cl	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE FB	E235.Cl	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W5	E235.Cl	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE W7	E235.Cl	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W9	E235.Cl	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1	E235.Cl	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W2	E235.Cl	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W3	E235.Cl	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W4	E235.Cl	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W6	E235.Cl	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE TB	E235.Cl	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Dup	E235.F	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
FB	E235.F	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W5	E235.F	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W7	E235.F	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W9	E235.F	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W1	E235.F	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W2	E235.F	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W3	E235.F	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W4	E235.F	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
W6	E235.F	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE TB	E235.F	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Dup	E235.NO3-L	14-Sep-2022	20-Sep-2022	3 days	6 days	× EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE FB	E235.NO3-L	14-Sep-2022	20-Sep-2022	3 days	6 days	× EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W5	E235.NO3-L	14-Sep-2022	20-Sep-2022	3 days	6 days	× EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W7	E235.NO3-L	14-Sep-2022	20-Sep-2022	3 days	6 days	× EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W9	E235.NO3-L	14-Sep-2022	20-Sep-2022	3 days	6 days	× EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1	E235.NO3-L	13-Sep-2022	20-Sep-2022	3 days	7 days	× EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W2	E235.NO3-L	13-Sep-2022	20-Sep-2022	3 days	7 days	× EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W3	E235.NO3-L	13-Sep-2022	20-Sep-2022	3 days	7 days	× EHT	20-Sep-2022	3 days	0 days	✓

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W4	E235.NO3-L	13-Sep-2022	20-Sep-2022	3 days	7 days	✖ EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W6	E235.NO3-L	13-Sep-2022	20-Sep-2022	3 days	7 days	✖ EHT	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE TB	E235.NO3-L	12-Sep-2022	20-Sep-2022	3 days	8 days	✖ EHTL	20-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Dup	E235.NO2-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	6 days	✖ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE FB	E235.NO2-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	6 days	✖ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W5	E235.NO2-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	6 days	✖ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W7	E235.NO2-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	6 days	✖ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W9	E235.NO2-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	6 days	✖ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1	E235.NO2-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	7 days	✖ EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W2	E235.NO2-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W3	E235.NO2-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W4	E235.NO2-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W6	E235.NO2-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE TB	E235.NO2-L	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	3 days	8 days	× EHTL
Anions and Nutrients : Sulfate in Water by IC										
HDPE Dup	E235.SO4	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE FB	E235.SO4	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W5	E235.SO4	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W7	E235.SO4	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
W9	E235.SO4	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
W1	E235.SO4	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
W2	E235.SO4	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
W3	E235.SO4	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
W4	E235.SO4	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
W6	E235.SO4	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
TB	E235.SO4	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
Dup	E509	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
FB	E509	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W5	E509	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W7	E509	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W9	E509	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W1	E509	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W2	E509	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W3	E509	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W4	E509	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) W6	E509	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W1	E421	13-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W2	E421	13-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W3	E421	13-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W4	E421	13-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W6	E421	13-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Dup	E421	14-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) FB	E421	14-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W5	E421	14-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W7	E421	14-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W9	E421	14-Sep-2022	21-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Dup	E358-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) FB	E358-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W5	E358-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W7	E358-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W9	E358-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1	E358-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W2	E358-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W3	E358-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W4	E358-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W6	E358-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Dup	E355-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) FB	E355-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W5	E355-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W7	E355-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W9	E355-L	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1	E355-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W2	E355-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W3	E355-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
W4	E355-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
W6	E355-L	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
TB	E355-L	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	8 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Dup	E290	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
FB	E290	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
W5	E290	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
W7	E290	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
W9	E290	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
W1	E290	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE W2	E290	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W3	E290	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W4	E290	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W6	E290	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TB	E290	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	14 days	8 days	✓
Physical Tests : Conductivity in Water										
HDPE Dup	E100	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE FB	E100	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE W5	E100	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE W7	E100	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE W9	E100	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE W1	E100	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE W2	E100	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE W3	E100	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE W4	E100	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE W6	E100	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	7 days	✓
Physical Tests : Conductivity in Water										
HDPE TB	E100	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	28 days	8 days	✓
Physical Tests : pH by Meter										
HDPE Dup	E108	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE FB	E108	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE TB	E108	12-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1	E108	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W2	E108	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W3	E108	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W4	E108	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W5	E108	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W6	E108	13-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W7	E108	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W9	E108	14-Sep-2022	20-Sep-2022	----	----		20-Sep-2022	0.25 hrs	6.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE Dup	E162	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE FB	E162	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W5	E162	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W7	E162	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W9	E162	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1	E162	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W2	E162	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W3	E162	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W4	E162	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE W6	E162	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE TB	E162	12-Sep-2022	----	----	----		20-Sep-2022	7 days	8 days	× EHT
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE Dup	E160-L	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE FB	E160-L	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W5	E160-L	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W7	E160-L	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W9	E160-L	14-Sep-2022	----	----	----		20-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W1	E160-L	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W2	E160-L	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W3	E160-L	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W4	E160-L	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE W6	E160-L	13-Sep-2022	----	----	----		20-Sep-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Low Level)										
HDPE TB	E160-L	12-Sep-2022	----	----	----		20-Sep-2022	7 days	8 days	× EHT
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Dup	E508	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) FB	E508	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W7	E508	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W9	E508	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W1	E508	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W2	E508	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W3	E508	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W4	E508	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W5	E508	14-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) W6	E508	13-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) TB	E508	12-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W1	E420	13-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W2	E420	13-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W3	E420	13-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W4	E420	13-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W6	E420	13-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	10 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) TB	E420	12-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	11 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Dup	E420	14-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) FB	E420	14-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W5	E420	14-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W7	E420	14-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W9	E420	14-Sep-2022	22-Sep-2022	----	----		23-Sep-2022	180 days	9 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	655291	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	655668	1	11	9.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	655285	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	655284	1	18	5.5	5.0	✓
Conductivity in Water	E100	655290	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	657804	2	37	5.4	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	656366	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	655666	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	655282	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	655287	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	655286	1	19	5.2	5.0	✓
pH by Meter	E108	655289	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	655283	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	656593	1	13	7.6	5.0	✓
Total Mercury in Water by CVAAS	E508	659063	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	657199	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	655667	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	655291	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	655668	1	11	9.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	655285	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	655284	1	18	5.5	5.0	✓
Conductivity in Water	E100	655290	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	657804	2	37	5.4	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	656366	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	655666	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	655282	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	655287	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	655286	1	19	5.2	5.0	✓
pH by Meter	E108	655289	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	655283	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	656593	1	13	7.6	5.0	✓
Total Mercury in Water by CVAAS	E508	659063	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	657199	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	655667	1	12	8.3	5.0	✓
TSS by Gravimetry (Low Level)	E160-L	656584	1	13	7.6	5.0	✓
Method Blanks (MB)							

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Alkalinity Species by Titration	E290	655291	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	655668	1	11	9.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	655285	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	655284	1	18	5.5	5.0	✓
Conductivity in Water	E100	655290	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	657804	2	37	5.4	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	656366	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	655666	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	655282	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	655287	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	655286	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	655283	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	656593	1	13	7.6	5.0	✓
Total Mercury in Water by CVAAS	E508	659063	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	657199	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	655667	1	12	8.3	5.0	✓
TSS by Gravimetry (Low Level)	E160-L	656584	1	13	7.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	655668	1	11	9.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	655285	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	655284	1	18	5.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	657804	2	37	5.4	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	656366	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	655666	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	655282	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	655287	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	655286	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	655283	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	659063	2	38	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	657199	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	655667	1	12	8.3	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry (Low Level)	E160-L Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	“Hardness (as $CaCO_3$), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Ion Balance using Total Metals	EC101A Vancouver - Environmental	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO_3.
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

QUALITY CONTROL REPORT

Work Order	: **WR2201094**	Page	: 1 of 18
Client	: Ensero Solutions Canada	Laboratory	: Whitehorse - Environmental
Contact	: Rachel Martz	Account Manager	: Heather McKenzie
Address	: #3 Calcite Business Centre 151 Industrial Road Whitehorse YT Canada Y1A 2V3	Address	: #12 151 Industrial Road Whitehorse, Yukon Canada Y1A 2V3
Telephone	: 306 978 3111	Telephone	: +1 867 668 6689
Project	: GCC	Date Samples Received	: 15-Sep-2022 10:47
PO	: ----	Date Analysis Commenced	: 20-Sep-2022
C-O-C number	: ----	Issue Date	: 29-Sep-2022 16:29
Sampler	: FS		
Site	: 2022 Pricing		
Quote number	: VA22-CAEG100-001		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 655289)											
WR2201087-020	Anonymous	pH	----	E108	0.10	pH units	8.37	8.36	0.120%	4%	----
Physical Tests (QC Lot: 655290)											
WR2201087-020	Anonymous	conductivity	----	E100	2.0	µS/cm	301	302	0.332%	10%	----
Physical Tests (QC Lot: 655291)											
WR2201087-020	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	148	151	2.01%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	5.4	5.4	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	2.7	2.7	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	153	156	1.94%	20%	----
Physical Tests (QC Lot: 656593)											
WR2201071-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	1590	1570	1.23%	20%	----
Anions and Nutrients (QC Lot: 655282)											
WR2201087-020	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.029	0.030	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 655283)											
WR2201087-020	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	17.0	17.1	0.322%	20%	----
Anions and Nutrients (QC Lot: 655284)											
WR2201087-020	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 655285)											
WR2201087-020	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 655286)											
WR2201087-020	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 655287)											
WR2201087-020	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 655668)											
WR2201094-001	W1	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 655666)											
WR2201094-001	W1	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.67	3.08	0.59	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 655667)											
VA22C1963-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	5.72	6.42	11.6%	20%	----
Total Metals (QC Lot: 657199)											
FJ2202597-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 657199) - continued											
FJ2202597-001	Anonymous	antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 659063)											
VA22C2456-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 659064)											
WR2201094-004	W4	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 656366)											
VA22C2415-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0108	0.0110	2.24%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0705	0.0739	4.60%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.534	0.554	3.60%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	0.000020	<0.000020	0.0000002	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.226	0.228	0.774%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000064	<0.0000050	0.0000014	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	132	132	0.628%	20%	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00302	0.00302	0.000002	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.0320	0.0326	1.83%	20%	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00032	0.00030	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	150	156	3.49%	20%	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	26.7	27.1	1.24%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	3.67	3.78	3.05%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00284	0.00280	1.49%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.0244	0.0250	2.37%	20%	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.670	0.705	5.03%	20%	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	10.2	10.4	2.74%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000238	0.000265	0.000027	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	19.3	19.3	0.0866%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	78.7	79.9	1.50%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.854	0.822	3.73%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000024	0.000023	0.0000008	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00078	0.00083	0.00005	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00433	0.00442	0.00009	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0042	0.0044	0.0001	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 656366) - continued											
VA22C2415-001	Anonymous	zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	0.00095	0.00091	0.00004	Diff <2x LOR	----
Dissolved Metals (QC Lot: 657804)											
VA22C2400-009	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 657805)											
WR2201094-004	W4	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 655290)						
conductivity	----	E100	1	µS/cm	1.4	----
Physical Tests (QCLot: 655291)						
alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 656584)						
solids, total suspended [TSS]	----	E160-L	1	mg/L	<1.0	----
Physical Tests (QCLot: 656593)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 655282)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 655283)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 655284)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 655285)						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 655286)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 655287)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 655668)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 655666)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 655667)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 657199)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 657199) - continued						
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 659063)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 659064)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 656366)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 656366) - continued						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 657804)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 657805)						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 655289)									
pH	----	E108	----	pH units	7 pH units	99.1	98.0	102	----
Physical Tests (QCLot: 655290)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.0	90.0	110	----
Physical Tests (QCLot: 655291)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	97.5	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	110	85.0	115	----
Physical Tests (QCLot: 656584)									
solids, total suspended [TSS]	----	E160-L	1	mg/L	150 mg/L	96.5	85.0	115	----
Physical Tests (QCLot: 656593)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 655282)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 655283)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 655284)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 655285)									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 655286)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.4	90.0	110	----
Anions and Nutrients (QCLot: 655287)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 655668)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	90.9	85.0	115	----
Organic / Inorganic Carbon (QCLot: 655666)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.7	80.0	120	----
Organic / Inorganic Carbon (QCLot: 655667)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	93.0	80.0	120	----
Total Metals (QCLot: 657199)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	99.2	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 657199) - continued									
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	106	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	95.7	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.2	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	97.9	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	93.7	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.9	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	104	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	115	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100.0	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	97.8	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	99.8	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	93.2	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	109	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.2	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	99.8	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	96.1	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	94.6	80.0	120	----
Total Metals (QCLot: 659063)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
Total Metals (QCLot: 659064)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	99.6	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 656366)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	101	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	95.7	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	93.4	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	106	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	107	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	100	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	94.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	100	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	109	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	109	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	108	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	95.1	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	96.1	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	100	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	100	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	96.8	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.7	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	100	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 655282)										
WR2201087-020	Anonymous	fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 655283)										
WR2201087-020	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 655284)										
WR2201087-020	Anonymous	chloride	16887-00-6	E235.Cl	105 mg/L	100 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 655285)										
WR2201087-020	Anonymous	bromide	24959-67-9	E235.Br-L	0.522 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 655286)										
WR2201087-020	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.495 mg/L	0.5 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 655287)										
WR2201087-020	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.64 mg/L	2.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 655668)										
WR2201094-002	W2	ammonia, total (as N)	7664-41-7	E298	0.0980 mg/L	0.1 mg/L	98.0	75.0	125	----
Organic / Inorganic Carbon (QCLot: 655666)										
WR2201094-002	W2	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 655667)										
WR2201094-001	W1	carbon, total organic [TOC]	----	E355-L	5.10 mg/L	5 mg/L	102	70.0	130	----
Total Metals (QCLot: 657199)										
FJ2202597-002	Anonymous	aluminum, total	7429-90-5	E420	0.188 mg/L	0.2 mg/L	93.9	70.0	130	----
		antimony, total	7440-36-0	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0393 mg/L	0.04 mg/L	98.2	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00976 mg/L	0.01 mg/L	97.6	70.0	130	----
		boron, total	7440-42-8	E420	0.093 mg/L	0.1 mg/L	93.1	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00398 mg/L	0.004 mg/L	99.6	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, total	7440-47-3	E420	0.0384 mg/L	0.04 mg/L	96.0	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0184 mg/L	0.02 mg/L	92.2	70.0	130	----
		copper, total	7440-50-8	E420	0.0184 mg/L	0.02 mg/L	91.9	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 657199) - continued										
FJ2202597-002	Anonymous	iron, total	7439-89-6	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0191 mg/L	0.02 mg/L	95.3	70.0	130	----
		lithium, total	7439-93-2	E420	0.0959 mg/L	0.1 mg/L	95.9	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		nickel, total	7440-02-0	E420	0.0375 mg/L	0.04 mg/L	93.7	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.4 mg/L	10 mg/L	104	70.0	130	----
		potassium, total	7440-09-7	E420	3.96 mg/L	4 mg/L	99.0	70.0	130	----
		selenium, total	7782-49-2	E420	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		silicon, total	7440-21-3	E420	9.20 mg/L	10 mg/L	92.0	70.0	130	----
		silver, total	7440-22-4	E420	0.00433 mg/L	0.004 mg/L	108	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		thallium, total	7440-28-0	E420	0.00396 mg/L	0.004 mg/L	98.9	70.0	130	----
		tin, total	7440-31-5	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		titanium, total	7440-32-6	E420	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		uranium, total	7440-61-1	E420	0.00388 mg/L	0.004 mg/L	96.9	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0977 mg/L	0.1 mg/L	97.7	70.0	130	----
		zinc, total	7440-66-6	E420	0.369 mg/L	0.4 mg/L	92.2	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
Total Metals (QCLot: 659063)										
VA22C2456-002	Anonymous	mercury, total	7439-97-6	E508	0.000101 mg/L	0.0001 mg/L	101	70.0	130	----
Total Metals (QCLot: 659064)										
WR2201094-005	W5	mercury, total	7439-97-6	E508	0.0000895 mg/L	0.0001 mg/L	89.5	70.0	130	----
Dissolved Metals (QCLot: 656366)										
VA22C2415-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0399 mg/L	0.04 mg/L	99.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00915 mg/L	0.01 mg/L	91.5	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00400 mg/L	0.004 mg/L	99.9	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 656366) - continued										
VA22C2415-002	Anonymous	chromium, dissolved	7440-47-3	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0192 mg/L	0.02 mg/L	96.2	70.0	130	----
		iron, dissolved	7439-89-6	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0962 mg/L	0.1 mg/L	96.2	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.0 mg/L	10 mg/L	110	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0418 mg/L	0.04 mg/L	105	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	20.3 mg/L	20 mg/L	101	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00392 mg/L	0.004 mg/L	97.9	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0410 mg/L	0.04 mg/L	103	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00393 mg/L	0.004 mg/L	98.3	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.401 mg/L	0.4 mg/L	100	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0421 mg/L	0.04 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 657804)										
VA22C2400-010	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000955 mg/L	0.0001 mg/L	95.5	70.0	130	----
Dissolved Metals (QCLot: 657805)										
WR2201094-005	W5	mercury, dissolved	7439-97-6	E509	0.0000985 mg/L	0.0001 mg/L	98.5	70.0	130	----

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number:

Environmental Division Whitehorse
Work Order Reference
WR2201094

Telephone : +1 867 668 6689

Report To	Contact and company name below will appear on the final report
Company:	Ensero Solutions
Contact:	rmartz@ensero.com
Phone:	
	Company address below will appear on the final report
Street:	#3 Calcite Business Centre, 151 Industrial Road.
City/Province:	Whitehorse, YT
Postal Code:	Y1A 2V3
Invoice To	Same as Report To
	Copy of Invoice with Report
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	
Quality Control (QC) Report with Report	
Select Distribution:	
Email 1 or Fax	rmartz@ensero.com
Email 2	chanson@ensero.com
Email 3	kmalowany@ensero.com

Invoice Distribution	
Select Invoice Distribution:	
Email 1 or Fax	ap@ensero.com
Email 2	

Project Information	
ALS Account # / Quote #:	
Job #:	GCC
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Can Dang Sampler: FS

Select Service Level Below - Please confirm all E&P TATs with your A

Regular [R]

PRIORITY (Business Days): 4 day [P4] | 3 day [P3] | 2 day [P2]

EMERGENCY: 1 Bu | San | Ste

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level sc

Analysis Requ

Indicate Filtered (F), Preserved (P) or Filtered and P

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total Metals (low level) + Hg, Hardness (as Ca	Dissolved Metals (low level) +Hg, Hardness (a	pH, Cond., Alk (total, OH, carb., bicarb)	Anions(Nitrate, Nitrite, Sulphate, Cl, F, Br)	TOC	TDS, TSS(low)		Total Ammonia	DOC	Anion Sum	Cation Sum	Cation-Anion Balance		Number of Containe
					P	F/P		P	P		P	P	F/					
	W1	13-Sep	16:55		R	R	R	R	R	R		R	R	R	R	R		
	W2	13-Sep-22	16:15		R	R	R	R	R	R		R	R	R	R	R		
	W3	13-Sep-22	15:10		R	R	R	R	R	R		R	R	R	R	R		
	W4	13-Sep-22	14:30		R	R	R	R	R	R		R	R	R	R	R		
	W5	14-Sep-22	8:45		R	R	R	R	R	R		R	R	R	R	R		
	W6	13-Sep-22	17:50		R	R	R	R	R	R		R	R	R	R	R		
	W7	14-Sep-22	9:45		R	R	R	R	R	R		R	R	R	R	R		
	W9	14-Sep-22	10:55		R	R	R	R	R	R		R	R	R	R	R		
	Dup	14-Sep-22	No Time		R	R	R	R	R	R		R	R	R	R	R		
	FB	14-Sep-22	10:55		R	R	R	R	R	R		R	R	R	R	R		
	TB	12-Sep-22	No time		R	R	R	R	R	R		R	R	R	R	R		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System?	
Are samples for human drinking water use?	Please send Yukon EQWin EDD with Report.

SAMPLE CONDITION AS R

Frozen ☐ SIF Obser

Ice Packs ☐ Ice Cubes ☐ Custody s

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C		
10	11	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT
Released by: FS	Date: 14-Sep-22	Time: 16:15	Received by:	Date: SEP 15	Time: 1047	Received by:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

2