Valentine Gold Project: Acid Rock Drainage/Metal Leaching (ARD/ML) Assessment Report of the Berry Pit

Final Report

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VALENTINE GOLD PROJECT: ACID ROCK DRAINAGE/METAL LEACHING (ARD/ML) ASSESSMENT REPORT OF THE BERRY PIT

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Executive Summary

Marathon Gold Corporation (Marathon) is currently constructing an open pit gold mine, located in the west-central region of the Island of Newfoundland, approximately 60 kilometres (km) southwest of the Town of Millertown, Newfoundland and Labrador (NL). The Valentine Gold Project (the Approved Project) is comprised of two open pits (Leprechaun and Marathon), waste rock piles, low-grade ore (LGO) stockpiles, a high-grade ore (HGO) stockpile, crushing and stockpiling areas, conventional milling and processing facilities (the mill), a tailings management facility (TMF), personnel accommodations, and supporting infrastructure, including roads, on-site power lines, buildings, and water and effluent management facilities.

Marathon is proposing to develop a third open pit and associated infrastructure, to be located between the Leprechaun and Marathon pits, referred to as the Berry Pit Expansion Project (the Project Expansion). The Project Expansion infrastructure includes the Berry pit, waste rock pile, topsoil stockpile, combined overburden and LGO stockpile with the Marathon pit stockpiles, and associated water management infrastructure. Ore from the Approved Project and Project Expansion open pits will be mined and processed from stockpiles for approximately 14.4 years. The Berry open pit, which is comprised of three basins (northern, central, and southern) would be mined in Years 1 to 9. Thereafter, tailings and/or waste rock will be backfilled into the combined southern and central basins.

This report provides results from the geochemical characterization program for the Berry pit, assesses the potential for the development of acid rock drainage (ARD) and metal leaching (ML) from mined materials, and identifies parameters of potential concern (POPC). The ARD/ML potential of the Leprechaun and Marathon deposits is available in the Valentine Gold Project: Acid Rock Drainage/Metal Leaching (ARD/ML) Assessment Report (Stantec 2022). Stantec 2022 was originally submitted to regulators as part of the Valentine Gold Project Environmental Impact Statement (Valentine Gold EIS; Marathon 2020). The work outlined in this report is required to support environmental assessment (EA) and permitting requirements for the Project Expansion.

The methods for the ARD/ML assessment generally followed the Mine Environment Neutral Drainage (MEND) publication entitled “Prediction Manual for Characterizing Drainage Chemistry from Sulphidic Geologic Materials” (Price 2009). The geochemistry baseline program included:

- Static testing of 425 samples of waste rock, ore, and overburden for Acid-Base Accounting (ABA), Shake Flask Extraction (SFE), and total metals,
- ARD/ML characterization of composite waste rock and ore samples based on the static test results, and
- Kinetic testing of composite samples including 16 humidity cells; six field leach bins are planned for installation in 2023.

Acid Potential (AP) was calculated from sulphide-sulphur ($S_{SULPHIDE}$) concentrations. Carbonate neutralization potential (Carbonate NP) was calculated from Total Carbon concentrations. ARD classification is based on a Carbonate Neutralization Potential Ratio (NPR) of samples compared to thresholds consistent with Price (2009). A sample is classified as Potentially Acid Generating (PAG) if Carbonate NPR is below 2; otherwise, the sample is classified as non-PAG. Sources of construction rock will be tested and evaluated prior to use. Only non-PAG material with a low potential to generate ML will be used in construction.

Metal leaching (ML) potentials were evaluated by screening the concentrations of trace elements in the leachates from SFE to the effluent quality limits prescribed in the *Metal and Diamond Mining Effluent Regulations* (MDMER) and to the Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CWQG-FAL). A high leaching potential was defined as parameters with concentrations exceeding MDMER concentrations in SFE tests, whereas a moderate leaching potential was defined as parameters with concentrations exceeding the CWQG-FAL.

The findings of this assessment are summarized below for each source of mined materials.

Approximately 8.5 million tonnes (Mt) of overburden will be generated from the Berry pit. As indicated above, overburden from both the Marathon and Berry pits will be stockpiled together. Overburden is classified as non-PAG material, with moderate leaching potential for F, Al, As, Cd, Cu, Fe, Mn, Ni, Pb, Se, and Zn based on shake flask extraction tests of individual samples. No parameters in SFE leachate of individual overburden samples exceeded MDMER, thus no parameters were classified as having a high leaching potential in the overburden. If PAG overburden is identified by confirmatory testing, the material will be segregated and placed in the waste rock pile in accordance with the management protocols for PAG waste rock to limit the potential for ARD.

Leachate from the SFE tests of individual samples of the various waste rock lithologies suggest moderate leaching potential for F, Al, As, Cd, Cu, Fe, Mo and Zn, based on at least one sample having SFE leachate concentrations that exceeded CWQG-FAL.

Up to 11% of the 160.5 Mt of waste rock is conservatively estimated to be PAG. PAG material will be backfilled in the Berry pit below the flood level, or PAG materials will be blended with non-PAG rock and encapsulated within non-PAG rock to reduce risk of localized ARD within the waste rock pile. This management strategy is proposed for all lithologies containing PAG rock.

Approximately 40% of the 5.0 Mt of LGO is conservatively classified as PAG. As indicated above, LGO from both the Marathon and Berry pits will be stockpiled together. The LGO stockpile will be processed before the estimated onset time of ARD for PAG-classified LGO from the Berry pit. In the current mine design, the Marathon LGO stockpile effluent has been segregated from other mine flow streams to facilitate collection and further ARD/ML treatment, if required. To further reduce ARD/ML risks, Stantec recommends preferentially stockpiling non-PAG LGO and direct PAG LGO to the mill feed as soon as practicable, as long as the grade requirement for the mill feed is met. There are no exceedances of MDMER concentrations in leachates from LGO laboratory tests under neutral pH conditions. Based on concentrations from SFE tests exceeding CWQG-FAL, Ag, Al, As and Zn have moderate leaching potential.

Approximately 58% of the 10.1 Mt of Berry HGO is conservatively classified as PAG. Berry, Leprechaun, and Marathon HGO will be stockpiled together, with 28.5% of the combined material originating from Berry. The overall mixture of HGO is non-PAG and not expected to generate ARD. Drainage from the HGO stockpile flows to the TMF and any potential acidity will be neutralized in the tailings pond or in the mill during processing. To limit exposure of PAG HGO within the stockpile, this ore will be preferentially directed to the mill feed, while non-PAG HGO can be allocated to the stockpile, as long as the grade requirement for the mill feed is met. No parameter concentrations exceeded MDMER in SFE leachate. There is moderate leaching potential, based on CWQG-FAL exceedances in SFE leachate for at least one individual sample, for F, Al, Cd, Fe, Mn, Pb, Se and Zn in the Berry HGO.

Abbreviations

Parameter	Comment
ABA	Acid-Base Accounting
ACUC	Average Concentration in the Upper Crust
AP	Acid Potential
ARD/ML	Acid Rock Drainage/Metal Leaching
CALA	Canadian Association for Laboratory Accreditation
CEA Agency	Canadian Environmental Assessment Agency
$CN_{(T)}$	Total Cyanide
CN_{WAD}	Weak-Acid Dissociable Cyanide
CVAAS	Cold Vapor Atomic Absorption Spectroscopy
CWQG-FAL	Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life.
DL	Detection Limit
EIS	Environmental Impact Statement
H_2O_2	Hydrogen Peroxide
HCl	Hydrochloric Acid
HCT	Humidity Cell Testing
HGO	High-grade Ore
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
km	Kilometre
LGO	Low-Grade Ore
m	Metre
MD	Mafic Dyke Unit
MDMER	*Metal and Diamond Mining Effluent Regulations*
MEND	*Mine Environment Neutral Drainage*
mg/L	Milligram per liter
mL	Milliliter
Mt	Million tonne

n	Count
NAG	Net Acid Generating
NaOH	Sodium Hydroxide
NH_3	Ammonia
NH_3+NH_4	Total Ammonia
NNP	Net Neutralization Potential
NP	Neutralization Potential
NPR	Neutralization Potential Ratio
OB	Overburden
PAG	Potentially Acid Generating
POPC	Parameters of Potential Concern
PSD	Particle Size Distribution
QA/QC	Quality Assurance / Quality Control
QPOR	Quartz Porphyry Unit
QTP	Quartz-Tourmaline-Pyrite Unit
SED	Sedimentary Unit
SFE	Shake Flask Extraction
SO_4	Sulphate
$S_{SULPHATE}$	Sulphate Sulphur
$S_{SULPHIDE}$	Sulphide Sulphur
TEC	Total Concentration of Trace Elements
TIC	Total Inorganic Carbon
TMF	Tailings Management Facility
wt. %	Percent by weight
%	Percent
<	Less than

1.0 INTRODUCTION

Marathon Gold Corporation (Marathon) is currently constructing an open pit gold mine, located in the west-central region of the Island of Newfoundland, approximately 60 kilometres (km) southwest of the Town of Millertown, Newfoundland and Labrador (NL) (Appendix A, Figure A-1). The Project Area includes several significant gold deposits, the Leprechaun, Marathon, Berry, Sprite and Victory gold deposits (Ausenco 2020). The Valentine Gold Project (the Approved Project) is comprised of two open pits (Leprechaun and Marathon), waste rock piles, low-grade ore (LGO) stockpiles, a high-grade ore (HGO) stockpile, crushing and stockpiling areas, conventional milling and processing facilities (the mill), a tailings management facility (TMF), personnel accommodations, and supporting infrastructure, including roads, on-site power lines, buildings, and water and effluent management facilities. The Approved Project was subject to both federal and provincial environmental assessment (EA), and Marathon submitted the Valentine Gold Environmental Impact Statement (Valentine Gold EIS; Marathon 2020) as part of the EA process for the Approved Project. The Approved Project was released from the provincial EA process in March 2022 and was given approval to proceed by the federal government in August 2022.

Marathon is now proposing to develop a third open pit, located between the Leprechaun and Marathon pits, referred to as the Berry Pit Expansion Project (the Project Expansion). The Project Expansion infrastructure includes the Berry pit, waste rock pile, topsoil stockpile, combined overburden and LGO stockpile with the Marathon pit stockpiles, and associated water management infrastructure. The mine site layout for the Approved Project and Project Expansion is provided in Appendix A, Figure A-2. Ore from the Approved Project and Project Expansion open pits will be mined and processed from stockpiles for approximately 14.4 years. The Berry pit, which is comprised of three basins (northern, central and southern) will be mined in Years 1 to 9. Thereafter, tailings and/or waste rock will be backfilled into the combined southern and central basins.

This Acid Rock Drainage (ARD) / Metal Leaching (ML) Assessment Report has been completed to help satisfy federal and provincial EA requirements for the Project Expansion. The Berry deposit represents approximately 29.3% of the Valentine Lake property resources. Only the Berry pit is addressed in this report, because the ARD/ML characterization of materials from the Marathon and Leprechaun pits has already been completed and documented (Stantec 2022).

The Berry deposit lies along a major regional fault zone in the central portion of Marathon's Valentine Lake property (Appendix A, Figure A-3). The Berry deposit is hosted predominantly by a quartz porphyry, comprising over 50% of the proposed open pit based on the geological model, the remainder of the deposit occurs in sedimentary host rocks (conglomerates). Discontinuous mafic dikes appear to be intimately associated with the development of mineralized veins The major types of veining encountered in the Project Area are gold-bearing quartz-tourmaline-pyrite (QTP) veins and barren quartz-calcite-chlorite veins. Pervasive carbonate-sericite and variably silicified alteration of the host rocks occurs in association with the QTP mineralized veining (Appendix A, Figures A-4, A-5, A-6). Approximately 160.5 Mt of waste rock will be mined from the Berry pit.

1.1 PURPOSE

The exposure and chemical weathering of some mine materials may result in acid generation and/or metal leaching (ML), which in turn may degrade runoff and groundwater quality. Geochemical characterization is required to assess the potential environmental effects of the Project Expansion and to inform permitting requirements. The geochemistry program described herein provides information about the ARD classification and ML potential of mine materials, and screening for parameters of potential concern (POPC) for rock materials associated with the Berry pit. The ARD/ML program for the EA and permitting of the Approved Project was completed in 2022 (Stantec 2022).

Testing and data analysis conducted on samples from the Berry deposit described in this ARD/ML Assessment Report includes:

- Static tests and analysis for 425 samples, plus the 16 composite samples for kinetic testing described below, from the Berry pit
- Initiation of twelve humidity cell tests (HCTs). HCT charges were selected based on results from the static testing: six HCTs contain the average composition of the waste rock lithologies, HGO and LGO; the other six HCTs contain potentially acid generating (PAG) or ML samples of waste rock lithologies, HGO, LGO and overburden
- Initiation of four HCTs containing carbonate depleted PAG waste rock and ore
- Initiation of a subaqueous and ageing column test of a tailings sample obtained from ongoing metallurgical work
- Planned installation of six field leaching bins (FLBs) containing waste rock lithologies, HGO and LGO has been delayed due to weather conditions. FLBs are anticipated to be constructed in 2023

1.2 REPORT STRUCTURE

This report consists of seven sections and four appendices that present the results of the ARD/ML assessment:

- Section 1: Introduction
- Section 2: Regulatory Requirements
- Section 3: Methodology
- Section 4: Results
- Section 5: Discussion
- Section 6: Conclusions
- Section 7: References
- Appendix A: Figures
- Appendix B: Tables
- Appendix C: Plots
- Appendix D: Certificates of Analyses and Tabulated Results

2.0 REGULATORY REQUIREMENTS

2.1 REGULATORY REQUIREMENTS

The Berry Pit ARD/ML assessment was designed to be consistent with the ARD/ML assessment for the Approved Project, which in turn was informed by requirements of the Provincial and Federal EIS Guidelines issued for the EA of the Approved Project under the Newfoundland and Labrador *Environmental Protection Act* (Government of NL 2020) and the *Canadian Environmental Assessment Act, 2012* (CEA Agency 2019), respectively. The Berry Pit ARD/ML report is also designed to satisfy the Development Plan Guidelines under the *Newfoundland and Labrador Mines Act* for the Project (Mineral Development Division, 2020).

These guidelines recommend use of the “Manual for Drainage Chemistry from Sulphidic Geologic Materials" produced by MEND for ARD/ML prediction (Price 2009). This manual was used in developing the study design and establishing ARD classification for this and previous studies.

The water quality criteria applicable to this study include the following:

1. Schedule 4 of *Metal and Diamond Mining Effluent Regulations* (MDMER) promulgated under the *Fisheries Act* (SOR/2002-222 2020)
2. Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life (CWQG-FAL) (Canadian by Council of Ministers of the Environment [CCME] 2020)
3. Schedule C of Newfoundland and Labrador Regulation 65/03 *Environmental Control Water and Sewage Regulations*, 2003 under the *Water Resources Act* (O.C. 2003-231) (NLR 65/03 2003)
4. Schedule C of the Newfoundland and Labrador Regulation 65/*03* refers to Sections 3, 19.1, and 20 and Schedule 4 of the MDMER as follows:

   “A person primarily in the Metal Mining Industry shall comply with sections 3 and 19.1 and 20 and Schedule 4 of the Metal Mining Effluent Regulations (Canada) SOR/2002-222, including any changes or amendments to those sections of and that schedule to those regulations over time.”

Therefore, the CWQG-FAL and MDMER water quality criteria are applied in this report.

2.2 REPORTING REQUIREMENTS

The Development Plan Guidelines for the Approved Project (Mineral Development Division, 2020) required an ARD/ML program and report that include the following:

- The report must characterize and evaluate the potential for and mitigation of ARD/ML at the project.
- The program must conform to the "Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials, MEND Report 1.20.0, December 2009".
- The results must be interpreted by an ARD/ML Qualified Professional (ARD/ML QP).
- The report must include:
  - Discussion of the adequacy of the number of samples collected for each geologic material and types of tests conducted on the samples;
  - Interpretation of the test results and justification for recommendations for further sampling, testing, and investigation;
  - Discussion of appropriate ARD/ML prevention, mitigation, and management strategies for the project;
  - Site specific recommendations for ARD/ML prevention, mitigation, and management including practical considerations for the project regarding storage, handling, and long-term disposal of residual ore, waste rock, and tailings;
  - A statement of qualifications by the ARD/ML QP;
  - Analytical results must be appended.

This report includes each of these items related to the Project Expansion, but more details related to discussion of ARD/ML management are presented in the updated ARD/ML Management Plan (Stantec 2023b).

3.0 METHODOLOGY

3.1 SAMPLING

3.1.1 Individual Samples

Samples were collected from waste rock lithologies, overburden, HGO, LGO, and tailings. Individual samples for the ARD/ML program were collected in 2022. A total of 425 samples including waste rock (n = 263), overburden (n = 45), and ore (n = 117) were collected from the exploration drill cores, excluding internal standards and blanks. The individual samples represent approximately 1 to 2 m intervals of core, with a few exceptions of shorter intervals. The number of samples collected and analyzed for this program are consistent with the guidance for initial sample number and sample frequency provided in Price (2009).

The 45 samples of overburden were collected by GEMTEC from test pits and drill holes located near the proposed open pit. Sampling intervals and descriptions of the overburden samples can be found in GEMTEC (2019 and 2022). Notably, 15 of the 45 overburden samples were not tested using ABA analyses.

Individual samples were submitted to SGS Canada Inc. (SGS) for static testing. SGS is certified by the Canadian Association for Laboratory Accreditation (CALA) for all analyses discussed in this report. The analytical methods for these tests are summarized in Section 3.2 and laboratory reports are presented in Appendix D.1 to D.3.

Not all individual samples were analyzed by all static test methods. The number of samples tested using each static method is consistent with the guidance provided in Price (2009; Table 3-1).

Table 3-1 Number of Individual Samples Tested by Lithology from the Berry Pit

Lithology	Material type	Expected Tonnage	Suggested frequency per Table 8-2, Price (2009)	Number of samples tested to date
Units		Mt	Number of samples	Number of Samples
Metasediments*	Waste Rock	44.1	80	83
Mafic Dykes	Waste Rock	7.7	26	42
QEPOR**	Waste Rock	106.3	80	108
QTP	Waste Rock	4.0	26	30
High Grade Ore	Ore	10.1	80	85
Low Grade Ore	Ore	5.0	29	32
Overburden	Waste	8.5	26	45

Notes:
*Sample count and geological model includes conglomerate and sediments with QTP veins (QZ-STQP).
**Sample count and geological model includes Quartz Porphyry Varieties, Mafic Dike and non-ore QTP veins in Quartz Porphyry and Mafic Dike. In ARD block model, Quartz Porphyry (QEPOR) includes Quartz Porphyry Varieties.

3.1.2 Composite Samples

Selected individual samples of different waste rock or ore lithologies were combined to produce composite samples of PAG and non-PAG material (Appendix B, Table B-1 and Table B-2). The material type of the composite samples are provided in Appendix B (Table B-2). The composite samples were prepared from the individual core samples crushed to minus 6 mm (¼") for static and HCT kinetic testing. Kinetic tests have been running for a range of 12 to 20 weeks at the time of this report and have not yet stabilized to completion.

3.2 LABORATORY ANALYSES

3.2.1 Static Tests

Samples for static testing were prepared by drying at 60°C, crushing, subsampling, and pulverizing to pass a number 200 mesh (0.74 mm) screen. The SGS Metallurgical Study describes preparation and leaching procedures (SGS 2019, 2020a, and 2020b).

Static testing conducted on the Berry pit samples included Acid-Base Accounting (ABA), solid phase total metals by *aqua regia* digestion and shake flask extraction (SFE) testing. Mineral identification analysis was also completed on Berry pit samples. The certificates of analyses for the static tests and mineral identification are presented in Appendix D.

3.2.1.1 Acid-Base Accounting

ABA was conducted on 410 samples. Analyses, methods and calculated parameters associated with ABA include:

- Paste pH — measured by inserting a combination pH electrode into a paste of the sample composed of 1:2 water-to-solid ratio.
- Total Sulphur — analyzed by a Horiba induction furnace with an infrared detector (IR) at or above a temperature of 1,650°C
- Sulphate-sulphur ($S_{SULPHATE}$) — extracted by digesting the sample in 15% hydrochloric acid (HCl) and measuring the leachate for sulphate (SO_4) by gravimetric methods.
- Sulphide-sulphur ($S_{SULPHIDE}$) — calculated from the difference between measured Total Sulphur and $S_{SULPHATE}$
- Acid Potential (AP) — calculated from the product of $S_{SULPHIDE}$ in a sample and 31.25 to yield results of acid potential in units of kg calcite ($CaCO_3$) equivalent/tonne.
- Total Carbon — analyzed by a Horiba induction furnace with an IR detector at or above temperatures of 1,650°C
- Modified Sobek Neutralization Potential (NP) — based on modified ABA testing (COASTECH Research Inc, 1991), wherein excess acid is added to the sample and a base is used to back-titrate. This method determines the total (bulk) neutralization potential, which is the balance between acid producing and acid consuming components of the sample.
- Carbonate NP — calculated from the measured concentration of Total Carbon and the assumption that all carbon occurs as calcite using the equation: Total Carbon (wt. %) × (100.09/12.01) × 1000/100, where 100.09/12.01 is the proportion of carbon in calcite and 1000/100 is the conversion from wt. % to kg$CaCO_3$/t. Assuming the Total Carbon concentration is provided only by calcite may overestimate carbonate NP.

3.2.1.2 Solid Phase Total Metals

Solid phase total metals were measured by *aqua regia* digestion on 348 individual samples plus 16 composite samples collected from the Berry pit. Pulverized samples were digested by *aqua regia*, a 3:1 mixture of hydrochloric and nitric acids, and the digestate was analysed for trace elements by Inductively Coupled Plasma Mass Spectrometry (ICP-MS).

3.2.1.3 Shake Flask Extraction Tests

SFE testing was used to assess short-term leaching of trace elements in 234 of the samples collected from the Berry pit. Waste rock and overburden samples were crushed to less than 6 mm (¼"); tailings were finer grained and not crushed for the SFE tests. The SFE tests consisted of continuous mixing of 250 g of crushed sample with 750 mL of deionized water for 24 hours. The leachate was analyzed for pH, alkalinity by titration, SO_4 (by colorimetric analysis); leachate was filtered through a 0.45 µm membrane filter and was analyzed for trace elements by ICP-MS and mercury (Hg) was analyzed by Cold Vapor Atomic Absorption Spectroscopy (CVAAS).

3.2.1.4 Mineral Identification

A total of 16 samples (overburden composite samples, waste rock composite samples, LGO composite samples and HGO composite samples) were submitted to SGS for mineral identification by X-ray diffraction (XRD) with Rietveld refinement. Samples were pulverized and analyzed by pattern-matching with reference patterns compiled by the Joint Committee on Powder Diffraction Standards – International Center for Diffraction Data (JCPDS-ICDD) database. Rietveld refinement provides quantitative analysis for crystalline compounds; non-crystalline or amorphous phases are not identified by XRD and therefore are not included in the interpretations. The detection limit of XRD is 0.5 – 2%, depending on the crystallinity of the mineral phases.

Two samples of tailings were submitted to SGS for mineral identification by the automated mineralogy system QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy). The detection limit of QEMSCAN depends on the size of the particles and the resolution of the backscatter image.

3.2.2 Kinetic Tests

Kinetic testing for the Berry pit includes:

- Six HCTs containing composite samples of waste rock, low grade ore, or high-grade ore (B QPOR, B SED, B MD, B QTP, B LGO, B HGO)
- Six HCTs containing composite samples of waste rock, low grade ore, high grade ore, or overburden that are either PAG or have moderate to high potential of ML (B QPOR-PAG, B SED-High SFE, B QTP-PAG, B LGO-PAG, B HGO-PAG, B OB-ML)
- Four HCTs using the PAG composite samples leached of carbonate (carbonate leached; B QPOR-PAG-CO3DP, B QTP-PAG-CO3DP, B LGO-PAG-CO3DP, B HGO-PAG-CO3DP)

- One composite sample of tailings (BL1021-43 Detox Tls) subjected to ageing and sub-aqueous testing.
- Six field leach bins (FLBs) are planned to be initiated in 2023. FLBs will contain composite samples of waste rock, low grade ore, or high-grade ore (B-QPOR_FB, B-CG_FB, B-MD_FB, B-QTP_FB, B-LGO_FB, B-HGO_FB).

3.2.2.1 Humidity Cell Tests

The HCTs were initiated and are ongoing at SGS (Table B-2 in Appendix B). A 1 kg sample was split from a larger composite, placed into a standard cell, and subjected to weekly “air and flood” cycles (ASTM, 2010). The HCTs were leached weekly with 1 L of deionized water to flush the reaction products. The HCT leachate was analyzed for the following parameters:

- pH and conductivity using electrodes
- Alkalinity by titration
- SO_4 by IC and fluoride (F) by ISE
- Trace elements by ICP-MS
- Hg by CVAAS

Leachate pH and conductivity were measured weekly. Alkalinity, SO_4, F, trace elements and Hg were measured bi-weekly until week 8, after which they were measured every 4 weeks.

Four samples with elevated ARD potential were subjected to induced carbonate depletion to evaluate the ML potential under acidic conditions. The composite samples were leached in acetic acid buffered by sodium acetate to pH 4 to 4.5. Carbonate leached HCTs are identified by “CO3DP” in the sample identification code, to distinguish from the original composite samples that were not subjected to an acetic acid leach.

At the time of this report, the HCTs have been initiated and are ongoing (Appendix B, Table B-2). Data summaries for the HCTs are provided in Appendix B, Table B-11. Analytical results of HCTs to May 2023 are presented in Appendix D.

HCTs are recommended to operate until release rates have stabilized (Price 2009). The HCT data available for this report suggest stabilization has not yet occurred therefore only preliminary results are provided herein. A summary of the humidity cell test samples and start dates are presented in Table B-2 (Appendix B).

Preliminary calculations using the initial HCT data through to May 2023 are presented in Table B-9 and include:

- Neutralization Potential (NP) Depletion Rate (in mg $CaCO_3$/kg/week) — calculated for weekly data by the equation: NP Depletion Rate = Sulphate Leaching Rate x 100.09/96.06 + Alkalinity Production Rate – Acidity Production Rate. Where 100.09/96.06 is the molar ratio of $CaCO_3$ to SO_4. Acidity production was not measured for the HCTs containing tailings and was omitted from the equation for the tailings HCTs; omitting acidity production results in a slightly more conservative NP depletion rate value.

- Carbonate NP depletion time (in years) — calculated using the carbonate NP and NP Depletion rate.
- ARD onset time (in years) — calculated for weekly data by the equation: ARD onset time = (Carbonate NP/NP depletion rate) x 1000(365.25/7), where 1000 is the unit conversion between kg $CaCO_3$/t reported for carbonate NP, and mg/kg obtained from HCT data, and 365.25/7 is the conversion to year.

Additional data analysis and interpretation of the HCT results will be completed after the HCTs have stabilized, including metal release rates, and the calculation of depletion times for acid generating, acid neutralizing and metal leaching minerals.

3.2.2.2 Field Bin Tests

Field leach bin (FLB) tests have not started at the time of this report but are anticipated to be initiated in 2023. Six FLB tests containing composite samples of waste rock, LGO and HGO will be established at Marathon's exploration camp in 2023 (Appendix B, Table B-2). The FLBs will contain approximately 50 - 100 kg of material. The FLB tests are kinetic tests with waste rock exposed to the natural field and weathering conditions at the site: natural precipitation will contact and flow through the rock in the FLB, and the leachate will accumulate in a collector at the base of the FLB. When the collector contains sufficient leachate volume, the leachate will be sampled approximately monthly during the ice-free season. If insufficient leachate is present in the collector one month after the previous sampling, the FLB will be artificially irrigated with a known volume of distilled water. Leachate pH and volumes will be measured and recorded. The leachate samples will be analysed for pH, alkalinity, dissolved trace elements, including low-level mercury analysis, SO_4, and other anions.

At the time of this report preparation, the waste rock material for the FLBs is at the site but the FLBs have not been constructed.

3.2.2.3 Aging Tests

Ageing tests are designed to account for the natural degradation of cyanide and ammonia species, and the attenuation of trace elements in the tailings pond. The tailings pulp supernatant was mixed at 200 revolutions per minute for 1 hour before being split into five representative test charges. Test charges were then allowed to age undisturbed under ultraviolet lamps for 24 hours per day. The test charges were sampled at the beginning of the test (day 0) and then on days 7, 14, 28, 56 for BL1021-43 Detox Tls; leachates were analysed for general water chemistry, trace elements, nitrogen, and cyanide species following the same methods as leachates from humidity cells. Analytical results of ageing tests are presented in the laboratory certificates of analysis Appendix D.

3.2.2.4 Subaqueous Columns

One sample (BL1021-43 Detox Tls) of tailings processed by the cyanide destruction procedure were subjected to sub-aqueous column tests to simulate seepage quality from the TMF under flow-through conditions. A 3-kg dry equivalent weight of tailing slurry was loaded into a column and allowed to settle overnight. Process water was added to the column from Week 0 to Week 10. Deionized water, spiked with lithium (Li), was added to the columns after Week 10 to simulate rinsing to tailings after closure. Samples of column effluent were collected at the base of the column at the beginning of the test (Week 0), then Week 1, 2, and 4 and every fourth week thereafter. The sampled solutions were tested for similar parameters, and using the same methods, as ageing tests. The analytical results of sub-aqueous columns tests are presented along with the laboratory certificates of analysis in Appendix D.

3.2.3 Quality Control

Laboratory analyses were conducted by SGS, which is certified by CALA. Select Certificate of Analysis (COA) from the laboratory include method details. Quality Assurance/Quality Control (QA/QC) procedures used for the select analyses are provided in Appendix D, including analysis of a standard reference samples, laboratory duplicate samples, and spike recoveries for every batch of samples.

Additional QA/QC measures were applied, including the following:

- Internal laboratory QA/QC procedures to meet the contractual obligations that the method detection limits (DLs) for all analyzed parameters were less than the CWQG-FAL guidelines and to ensure high-quality analyses; and
- Screening of all analytical results following Stantec's Standard Operating Procedures. In the event of a discrepancy or suspected results, samples are re-checked or re-analyzed to confirm or replace the original reported value.

3.3 CALCULATIONS AND CLASSIFICATION CRITERIA

The following sections describe the criteria for ARD/ML classification of the materials produced from the Berry pit. Values below the DL were assigned a value of one half the DL for all calculations presented in this report.

3.3.1 ARD Criteria

3.3.1.1 Static Tests

The methods for the ARD/ML assessment using static tests are consistent with the MEND Manual (Price 2009).

Carbonate NP was calculated using the laboratory results of Total Carbon analyses and by applying the following equation:

$$\text{Carbonate NP } (CaCO_3 \text{ kg/t}) = \text{Total Carbon (wt.\%)} \times (100.09/12.01) \times 1000/100 \qquad (3.3\text{-}1)$$

Where: 100.09/12.01 is the ratio of the molecular weight of calcium carbonate to elemental carbon and 1000/100 is the conversion factor from wt.% to kg $CaCO_3$/t.

AP was calculated by the laboratory as the arithmetic difference between Total Sulphur and $S_{SULPHATE}$ by the equation:

$$AP = 31.25 \times (\text{Total Sulphur (wt. \%)} - S_{SULPHATE} \text{ (wt. \%)}) \quad (3.3\text{-}2)$$

For samples with Total Sulphur concentrations below the DL of the $S_{SULPHATE}$ analytical method, or with DL for Total Sulphur less than $S_{SULPHIDE}$, the $S_{SULPHATE}$ is negligible and equation 3.3-2 reduces to an AP calculated only by the Total Sulphur concentration:

$$AP = 31.25 \times \text{Total Sulphur (wt. \%)} \quad (3.3\text{-}2)$$

The acidic drainage potential was classified based on the balance between acid generating and neutralizing reactions as indicated by the carbonate neutralization potential ratio (NPR) in equation 3.3-4:

$$\text{Carbonate NPR} = \text{Carbonate NP/AP} \quad (3.3\text{-}4)$$

The MEND Manual (Price, 2009) ARD classification based on NPR is given by:

- PAG, if NPR is less than (<) 1;
- Uncertain ARD potential if NPR is between 1 and 2; and
- Non-PAG if NPR is greater than (>) 2.

Carbonate NPR was used for the ARD classification of materials for the Berry pit. To be conservative and to eliminate the uncertainty related with the samples within the range of Carbonate NPR between 1 and 2, samples for this Project were classified as PAG if Carbonate NPR < 2. The paste pH and SFE pH values were used to confirm that no sample with Carbonate NPR > 2 generated acid.

Additional calculations included:

Carbonate Net Neutralization Potential (NNP) was calculated by subtracting the AP from the Carbonate NP:

$$\text{Carbonate NNP (kg } CaCO_3\text{/t)} = \text{Carbonate NP} - \text{AP} \quad (3.3\text{-}5)$$

Carbonate NP, AP and Carbonate NPR in composite ore samples were calculated using Total Carbon and $S_{SULPHIDE}$ analysis generated by SGS (2019, 2020a, and 2020b).

3.3.1.2 Kinetic Tests

The weekly rates of acidity generation and alkalinity depletion were calculated by multiplying the concentrations of SO_4 and alkalinity by the volume of recovered leachate and dividing by the mass of material in the humidity cell. For kinetic tests, concentrations reported below the DLs were set at one half the value of the DL for statistical calculations and plotting (Appendix C). At the time of writing, the HCTs have been operating for 11 – 20 weeks (Appendix B, Table B-2).

To use HCT tests to calculate mass loadings for waste rock and tailings, the HCT tests should be operated until mass loading rates stabilize, and at least 40 weeks. At the time of this report preparation, the HCTs for this Project mass loading rates had not yet stabilized. The HCTs will continue to operate until stabilization has been observed, and the results will be reviewed; interpretations will be revised if necessary and calculations of the depletion of acid generating, acid neutralizing and metal leaching will be completed.

3.3.2 Metal Leaching Criteria

ML potential and screening for POPCs were evaluated by comparing the solid phase metal concentrations to average crustal abundances, and screening static tests results to water quality guidelines.

Metals concentrations in the individual samples of ore, waste rock, and overburden were compared to average elemental abundances in the upper Earth's crust (Average Concentration in the Upper Crust or ACUC) (Rudnick and Gao 2004) as a screening tool for potentially elevated concentrations. Element concentrations exceeding ten times (10x) ACUC were considered elevated. Elevated elemental concentration used as a screening parameter does not necessarily indicate elevated leaching potential or environmentally significant elements. Therefore, exceedances of 10x ACUC were only discussed for elements showing leaching potentials from SFE analyses and/or exceedances of CWQG-FAL in static tests.

Although CWQG-FAL and MDMER are not directly applicable to SFE, tailings aging test, or subaqueous column leachates, screening against these criteria may identify parameters for additional investigation. Additionally, parameters elevated above ACUC or in leachates will not necessarily result in elevated discharge concentrations, but rather assist in understanding POPCs. To screen for POPC, metal concentrations and pH in SFE leachates from individual samples were compared to the MDMER, Table 1 of Schedule 4 and to CWQG-FAL (CCME 2020). For guidelines dependent on temperature, pH, hardness, and/or dissolved organic carbon, the lowest CWQG-FAL values were used as a measure of conservatism. Comparing the SFE leachate results to the MDMER limits and CWQG-FAL represents a qualitative comparison because the rock:solution ratio of 1:3 used in the leaching tests will differ from the actual field conditions.

The leaching potential was qualitatively assessed based on the magnitude of MDMER and CWQG-FAL exceedances of the leachate from the SFEs, tailings aging test and subaqueous columns using the classification:

- High leaching potential: concentration exceeds MDMER;
- Moderate leaching potential: concentration is less than MDMER but greater than CWQG; and
- Low leaching potential: concentration is less than CWQG.

Moderate leaching potential indicates the potential for exceedances of CWQG-FAL in the mixing zones of the receiving waters, which has been further assessed by water quality modelling and assimilative capacity studies.

The ML will be reviewed and revised, as necessary, based on a comparison to stabilized kinetic test leaching rates and mass loadings, water quality predictions of effluent quality at discharge locations, and field sampling programs.

4.0 RESULTS

4.1 MINERAL IDENTIFICATION

Mineral identification by XRD was completed on composite samples of waste rock, LGO, HGO, and overburden. The QEMSCAN system was used for mineral identification of the tailings samples. The dominant minerals in each lithology were identified as the common rock-forming minerals quartz and feldspars (Appendix B, Table B-3).

Pyrite was identified by XRD in the waste rock and tailings samples and pyrite and/or marcasite was identified by QEMSCAN in the tailings samples; pyrite and marcasite cannot be distinguished in the QEMSCAN method and are reported as combined “pyrite/marcasite”. Low concentrations of sulfide minerals (below the XRD detection limit of approximately 0.5 – 2 wt. %, or particles smaller than the resolution for QEMSCAN) may not be identified by XRD. Chalcopyrite was identified by QEMSCAN in the tailings samples only.

The carbonates calcite and/or magnesian calcite, rapidly dissolving minerals for acid neutralization (e.g., Paktunc, 1999), were present in all waste rock samples and tailings, but were absent in the overburden sample (B-OB-ML). Ankerite was identified at concentrations <1 wt.% in the overburden sample, two waste rock samples, and the tailings samples. Contribution from silicate weathering to NP is limited by slower rates of dissolution compared to carbonate minerals.

Berry pit area overburden (B-OB-ML) consists mainly of quartz (37.6 wt. %), plagioclase (36.3 wt. %), muscovite/paragonite (12.5 wt. %), chlorite (6.1 wt. %), and actinolite (5.2 wt. %). The carbonate mineral ankerite (0.5 wt. %) and the sulfide mineral pyrite (0.2 wt. %) were identified in trace amounts (Appendix B, Table B-3).

Major minerals identified in the samples of the quartz porphyry lithology (B QPOR, B QPOR-PAG, B QPOR-PAG-CO3DP) were the rock-forming aluminosilicate minerals quartz, plagioclase, and muscovite/paragonite (Appendix B, Table B-3). In the B QPOR, the mineral mass percentages of magnesian calcite (3.5 wt. %) is more than 10x the mineral mass percentage of the sulphide minerals, pyrite (0.3 wt. %). In B QPOR-PAG, the mineral mass percentage of calcite minerals (2.7 wt. %) is approximately double that of pyrite (1.2 wt. %). In B QPOR-PAG-CO3DP, the mineral mass percentage of calcite is much lower (0.09 wt. %) than the non-depleted sample (B QPOR-PAG), but the pyrite content (1.3 wt. %) was similar.

The sedimentary lithology (B SED, B SED-High SFE) dominantly consists of plagioclase, quartz, and muscovite/paragonite. In B SED, the identified carbonate minerals were calcite (3.2 wt. %), magnesian calcite (1.9 wt. %), and ankerite (3.9 wt. %); the sulphide mineral was pyrite (0.1 wt. %). In B SED-High SFE, the only carbonate mineral identified was calcite (4.0 wt. %) and the only sulphide minerals identified was pyrite (0.2 wt. %).

The mafic dike lithology (B MD) dominantly consists of quartz (42.0 wt. %), plagioclase (19.8 wt. %), chlorite (16.1 wt. %), and muscovite/paragonite (10.9 wt. %). The carbonate minerals identified were calcite (5.7 wt. %) and ankerite (0.6 wt. %); pyrite was identified in trace amounts (0.3 wt. %).

The major minerals identified in quartz-Au mineralized zone within QTP veins lithology (B QTP, B QTP-PAG, B QTP-PAG-CO3DP) were quartz and plagioclase, followed by muscovite/paragonite and chlorite. In B QTP, the combined weight percentage of calcite (1.1 wt. %) and magnesian calcite (2.4 wt. %) was approximately 9x the weight percentage of pyrite (0.4 wt. %). In B QTP-PAG, the calcite mineral mass percentage (3.4 wt. %) was approximately that of pyrite (1.4 wt. %). In B QTP-PAG-CO3DP, the mineral mass percentage of calcite (0.05 wt. %) was much lower than that of the non-depleted sample (B QTP-PAG), but the pyrite content (1.4 wt. %) was similar.

Major minerals in Berry LGO samples (B LGO, B LGO-PAG, B LGO-PAG-CO3DP) were identified as quartz, plagioclase, and muscovite/paragonite. In B LGO, the combined mineral mass percentage of calcite (2.8 wt. %) and magnesian calcite (2.5 wt. %) was more than 4x that of pyrite (1.2 wt. %). In B LGO-PAG, the combined mineral mass percentage of calcite (2.1 wt. %) and magnesian calcite (1.1 wt.%) is approximately half that of pyrite (6.9 wt. %). In B LGO-PAG-CO3DP, the mineral mass percentage of calcite (0.09 wt. %) was much lower than the non-depleted sample (B LGO-PAG), but the pyrite content (6.4 wt. %) was similar.

Berry HGO samples (B HGO, B HGO-PAG-Zn, B HGO-PAG-Zn-CO3DP) dominantly consist of quartz and plagioclase, and to a lesser extent muscovite/paragonite and chlorite. In B HGO, the combined mineral mass percentage of calcite (1.8 wt. %) and magnesian calcite (2.4 wt. %) was approximately 4x the that of pyrite (1.1 wt. %). In B HGO-PAG-Zn, the combined mineral mass percentage of calcite (1.5 wt. %) and magnesian calcite (0.3 wt. %) is 1.6x greater than that of percentage of pyrite (1.1 wt. %). In B HGO-PAG-Zn-CO3DP, the mineral mass percentage of calcite (0.1 wt. %) was much lower than the non-depleted sample (B HGO-Zn-PAG), but the pyrite content (1.2 wt. %) was similar.

Tailings associated with the Berry pit (BL1021-24D Detox Tls, BL1021-43 Detox Tls) consisted mostly of quartz and plagioclase, with significant amounts of muscovite/sericite, chlorite and clays. In BL1021-24D Detox Tls, the combined mineral mass percentage of calcite and ankerite (3.6 wt. %) is more than 3x that of pyrite/marcasite (1.0 wt. %). In BL1021-23 Detox Tls, the combined mineral mass percentage of calcite and ankerite (4.6 wt. %) is more than 3x that of pyrite/marcasite (1.3 wt. %). Both tailing samples had sphalerite identified in trace amounts (0.01 wt. %).

4.2 STATIC TESTS

The results of the geochemical characterization of samples are provided in Appendix B (Table B-8, Table B-9 and Table B-10).

4.2.1 Overburden

All of the 30 overburden samples tested for ABA had a carbonate NPR > 2 (Appendix B, Table B-4). As such, the overburden is classified as non-PAG. The average AP value (0.23 kg $CaCO_3$/t) was approximately 90x lower than the average carbonate NP value (21 kg $CaCO_3$/t; Appendix B, Table B-5). The minimum paste pH was 7.12.

Forty-five overburden samples were subjected to SFE tests. Measurements of pH in the SFE leachate were less than the lower MDMER limit of pH 6.0 in 4% of samples and greater than the upper CWQG-FAL limit of pH 9.5 in 2% of samples subjected to SFE tests. Overburden SFE leachate concentrations exceeded CWQG-FAL for F (73% of samples), Al (93% of samples), As (56% of samples), Cd (18% of samples, Cu (58% of samples), Fe (33% of samples), Mn (18% of samples), Ni (4% of samples) Pb (24% of samples), Se (22% of samples), and Zn (51% of samples). Concentrations of 10x ACUC were identified in 69% of samples for manganese (Mn), 33% for As, and 2% for Se (Appendix B, Table B-4 and B-7).

The B OB-ML composite sample was classified as non-PAG, with an NPR value > 2. The AP value (1.3 kg CaCO3/t) is approximately 15x lower than the carbonate NP value (20.5 kg CaCO3/t). Leachate from the SFE of the composite sample did not exceed any MDMER concentrations but exceeded CWQG-FAL for Cd, Cu, Mn, and Se concentrations. No solid phase total metals concentrations in B OB-ML composite sample exceeded 10x ACUC.

4.2.2 Waste Rock

4.2.2.1 Quartz Porphyry (QE-POR)

Most samples (88 of 108 samples, 82%) of QE-POR were classified as non-PAG. Of the QE-POR samples, 18% were classified as PAG, with carbonate NPR < 2 (Appendix B, Table B-4). The average AP value (9.1 kg $CaCO_3$/t) was approximately 5x lower than the carbonate NP value (44 kg $CaCO_3$/t; Appendix B, Table B-5). All samples had paste pH greater than 8.6. Measured pH values in leachate from the 2% of the SFE tests exceeded the upper CWQG-FAL limit of 9.0, suggesting the short-term acid neutralization capacity is greater than the short-term acid generating capacity.

Concentrations of Al exceed the CWQG-FAL of 0.1 mg/L in leachate from all 51 SFE tests; exceedances of CWQG-FAL also occurred in leachate concentrations for Zn (22% of samples), F (10% of samples), As (6% of samples), Fe (6% of samples) and Cu (4% of samples). Of the 108 samples tested for solid phase total metals, none exceeded 10x ACUC for the POPCs identified by SFE leachate concentrations.

Composite sample B QPOR has a carbonate NPR > 2; the sample is classified as non-PAG (Appendix B, Table B-8). The AP value (7.5 kg $CaCO_3$/t) is approximately 4x lower than the carbonate NP value (27.6 kg $CaCO_3$/t); the paste pH value was 9.46. Leachate from the SFE test exceeded the CWQG-FAL for F, Al, Cd and Se concentrations.

The B QPOR-PAG composite sample had a carbonate NPR < 1; the sample is classified as PAG (Appendix B, Table B-8). The AP value (29.1 kg $CaCO_3$/t) is 2.3x higher than the carbonate NP value (12.9 kg $CaCO_3$/t); the paste pH was 9.20. Leachate from the SFE test exceeded the CWQG-FAL for Al concentrations.

The B QPOR-PAG-CO3DP composite sample had an NPR < 1; this carbonate-depleted sample is classified as PAG (Appendix B, Table B-8). The AP value (40.6 kg $CaCO_3$/t) is 4.0x higher than the carbonate NP value (10.1 kg $CaCO_3$/t); the paste pH was 9.11.

Composite sample B-QPOR_FB had a carbonate NPR > 2; the sample is classified as non-PAG (Appendix B, Table B-8). The AP value (7.2 kg $CaCO_3$/t) is 5.2x lower than the carbonate NP value (37.4 kg $CaCO_3$/t); the paste pH was measured to be 9.45. The SFE leachate exceeded of the CWQG-FAL for Al concentrations.

4.2.2.2 Sediments (SED)

Of the 83 samples of SED lithology, which includes conglomerates and sediments with QTP veins, only one had carbonate NPR between 1 and 2; the remaining 82 samples had carbonate NPR > 2 (Appendix B, Table B-4); 98% of samples of SED lithology are classified as non-PAG and 2% are classified as PAG. The average AP value (3.0 kg $CaCO_3$/t) is approximately 30x lower than the carbonate NP value (90 kg $CaCO_3$/t; Appendix B, Table B-5). All 83 samples had paste pH greater than 8.92. Of the 83 samples subjected to the SFE tests, leachate pH values exceeded the CWQG-FAL maximum pH value of 9.0 in 5% of samples.

Concentrations of Al, F, Zn, Fe, Cd, As and Mo exceed CWQG-FAL in leachate from SFE tests in 100%, 19%, 12%, 7%, 5%, 2% and 2%, of samples respectively. The solid phase total metal concentration for Mo exceeded 10x ACUC in 2% of samples.

B SED composite sample has carbonate NPR > 2; the material is classified as non-PAG (Appendix B, Table B-8). The AP value (1.3 kg $CaCO_3$/t) is approximately 54x lower than the carbonate NP value (70.0 kg $CaCO_3$/t); the paste pH was 9.21. The SFE leachate from the pre-HCT SFE test exceeded the CWQG-FAL for Al and F concentrations. The HCT is still in progress; a post-HCT SFE test will be conducted when the tests are complete and terminated.

B SED-High SFE composite sample had carbonate NPR > 2; the material is classified as non-PAG (Appendix B, Table B-8). The AP value (3.1 kg $CaCO_3$/t) is approximately 8.4x lower than the carbonate NP value (26.0 kg $CaCO_3$/t); the paste pH was 9.07. The leachate concentrations of Al and F from the pre-HCT SFE test exceeded the CWQG. The HCT is still in progress; a post-HCT SFE test has not been conducted.

B-CG_FB composite sample has carbonate NPR > 2; the material is classified as non-PAG (Appendix B, Table B-8). The AP value (1.3 kg $CaCO_3$/t) is approximately 56.4x lower than the carbonate NP value (73.3 kg $CaCO_3$/t); the paste pH was 9.35. Leachate from the SFE test exceeded the CWQG-FAL for Al concentrations.

4.2.2.3 Mafic Dykes (MD)

Of the 42 samples from the MD unit, only one had a carbonate NPR between 1 and 2 and none with NPR < 1 (Appendix B, Table B-4); 2% of the material from this lithology is classified as PAG and 98% as non-PAG. The average AP value (5.7 kg $CaCO_3$/t) is approximately 21x lower than the average carbonate NP value (119.0 kg $CaCO_3$/t; Appendix B, Table B-5). All samples had paste pH greater than 8.59.

Of the 22 MD samples subjected to SFE tests, leachate concentrations exceeded the CWQG-FAL for Al, F, As and Zn for 100%, 18%, 9% and 9% of the samples, respectively. Of the 42 MD lithology samples tested, solid phase total metals exceeded 10x ACUC for As in 2% of the samples.

B MD composite sample had carbonate NPR > 2; the composite sample is classified as non-PAG (Appendix B, Table B-8). The AP value (6.9 kg $CaCO_3$/t) is approximately 10x lower than the carbonate NP value (70.7 kg $CaCO_3$/t); the with paste pH of 8.88. The SFE leachate exceeded the CWQG-FAL for Al concentrations. The solid phase total metal Mn concentration exceeded 10x ACUC.

B-MD_FB composite had a carbonate NPR > 2 (Appendix B, Table B-8); the composite sample is classified as non-PAG. The paste pH was 9.07 (Appendix B, Table B-8). The AP value (3.1 kg $CaCO_3$/t) is 32x lower than the carbonate NP value (100.0 kg $CaCO_3$/t). The SFE leachate exceeded the CWQG-FAL for Al concentrations. The solid phase total metal Mn concentration exceeded 10x ACUC.

4.2.2.4 Non-ore Quartz-Tourmaline-Pyrite Veins (QTP)

Of the 30 samples of QTP lithology, six (20%) had carbonate NPR < 2 and are classified as PAG (Appendix B, Table B-4). The average AP value (12 kg $CaCO_3$/t) is approximately 3x lower than the average carbonate NP value (38 kg $CaCO_3$/t; Appendix B, Table B-5). All samples had paste pH greater than 8.98.

Of the 14 QTP samples subjected to SFE tests, one exceeded the CWQG-FAL upper pH guideline of 9.0. The SFE leachate exceeded the CWQG-FAL for concentrations of Al (100%), F (%), and Cd (14%). Nineteen samples were subjected to solid phase total metals analysis, with 5% of samples exceeding 10x ACUC for Cd.

The B QTP composite sample had a carbonate NPR > 2; the sample is classified as non-PAG. The AP value (7.8 kg $CaCO_3$/t) is approximately 3x lower than the carbonate NP value (23.5 kg $CaCO_3$/t); the paste pH of 9.45 (Appendix B, Table B-8). The SFE leachate exceeded the CWQG-FAL for Al, Cd and Se concentrations.

The B QTP-PAG composite had a carbonate NPR < 1; the composite sample is classified as PAG material. The paste pH was 9.24 (Appendix B, Table B-8). The AP value (40.6 kg $CaCO_3$/t) is approximately 2x higher than the carbonate NP value (20.1 kg $CaCO_3$/t). The SFE leachate from the pre-HCT SFE test exceeded the CWQG-FAL for Al concentrations. The HCT is still in progress; a post-HCT SFE test has not been conducted.

The B QTP-PAG-CO3DP composite sample had an NPR < 1; the carbonate-depleted composition sample is classified as PAG material (Appendix B, Table B-8). The AP value (35.3 kg $CaCO_3$/t) is 5.4x higher than the carbonate NP value (6.5 kg $CaCO_3$/t); the paste pH was 9.14.

B-QTP_FB composite had a carbonate NPR > 2; the composite sample is classified as non-PAG material. The paste pH was 9.40 (Appendix B, Table B-8). The AP value (7.2 kg $CaCO_3$/t) is 4.2x lower than the carbonate NP value (30.2 kg $CaCO_3$/t). The SFE leachate exceeded the CWQG-FAL for Al concentrations.

4.2.3 Ore

4.2.3.1 Low-Grade Ore (LGO)

Of the 32 samples of LGO, 13 (40%) had carbonate NPR< 2, and were classified as PAG (Appendix B, Table B-4). The average AP value (28 kg$CaCO_3$/t) is 1.4x lower than the average carbonate NP value (40 kg $CaCO_3$/t; Appendix B, Table B-5). All samples had paste pH greater than 8.33.

SFE tests were conducted on 16 LGO samples. The SFE leachate exceeded the CWQG-FAL for concentrations of Al (100%), As (13%), Ag (6%) and Zn (6%). Of the POPCs identified by SFE leachate concentrations exceeded 10x ACUC in the 18 samples tested for solid phase total metals.

The low-grade ore composite sample (B LGO) had carbonate NPR < 1 and was classified as PAG (Appendix B, Table B-8). The AP value (60.0 kg $CaCO_3$/t) is approximately 1.8x lower than the carbonate NP value (33.1 kg $CaCO_3$/t. Paste pH was 9.02. The SFE leachate exceeded CWQG-FAL for Al concentrations.

B LGO-PAG composite has a carbonate NPR < 1 and is classified as PAG material (Appendix B, Table B-8). The AP value (160 kg $CaCO_3$/t) is 6.4x higher than the carbonate NP value (25.1 kg $CaCO_3$/t). The paste pH is 8.39. The SFE leachate exceeded the CWQG-FAL for Al concentrations.

The carbonate-depleted composite sample B LGO-PAG-CO3DP had a carbonate NPR < 1 (Appendix B, Table B-8) and is classified as PAG material. The AP value (137.0 kg $CaCO_3$/t) is 15.9x higher than the carbonate NP value (8.6 kg $CaCO_3$/t). The paste pH was 8.23.

B-LGO_FB has a carbonate NPR > 2 with a paste pH of 9.43 (Appendix B, Table B-8). The AP value (15.0 kg $CaCO_3$/t) is approximately 2.1x lower than the carbonate NP value (31.7 kg $CaCO_3$/t. Leachate from the SFE test exceeded the CWQG-FAL for Al concentrations.

4.2.3.2 High-Grade Ore (HGO)

Of the 85 HGO samples, 49 had carbonate NPR < 2 (Appendix B, Table B-4), thus 58% is classified as PAG. The average AP value of 30 kg $CaCO_3$/t is 1.5x lower than the average carbonate NP value of 44 kg $CaCO_3$/t (Appendix B, Table B-5). All samples had paste pH between 8.09 and 9.91.

Values of pH in SFE leachate exceeded the upper CWQG-FAL limit of 9.0 in 4 of the 44 (9%) SFE tests. The SFE leachate concentrations from the 44 samples tested exceeded the CWQG-FAL for Al (98% of samples), F (14% of samples), Zn (11% of samples), Fe (7% of samples), Cd (5% of samples), Pb (5% of samples), Mn (2% of samples) and Se (2% of samples) (Appendix B, Table B-9). Solid phase total metals were measured on 52 HGO samples, with 10× ACUC exceeded for Mn, Cd, and Se in 10%, 4% and 4% of samples, respectively.

The B HGO composite sample had carbonate NPR between 1 and 2 and is classified as PAG. The paste pH was 9.48 (Appendix B, Table B-8). The AP value (23.8 kg $CaCO_3$/t) was similar to the carbonate NP value (26.7 kg $CaCO_3$/t). The SFE leachate exceeded the CWQG-FAL for Al and Cu concentrations.

B HGO-PAG-Zn composite was prepared to represent ore from the Berry pit with the highest potential for ARD/ML. The sample is classified as PAG with a carbonate NPR < 1 (Appendix B, Table B-8). The AP value (23.1 kg $CaCO_3$/t) is 1.5x higher than the carbonate NP value (15.4 kg $CaCO_3$/t); the paste pH was 9.29. Leachate from the SFE test exceeded the CWQG-FAL for Al concentrations.

The carbonate-depleted sample B HGO-PAG-Zn-CO3DP is classified as PAG with carbonate NPR < 1 (Appendix B, Table B-8). The AP value (22.2 kg $CaCO_3$/t) is 7.4x higher than the carbonate NP value (3.0 kg $CaCO_3$/t). The paste pH was 8.99.

B-HGO_FB sample had a carbonate NPR between 1 and 2 and was classified as PAG. The paste pH was 9.34 (Appendix B, Table B-8). The AP value (18.8 kg $CaCO_3$/t) is approximately 1.6x lower than the carbonate NP value (29.7 kg $CaCO_3$/t). Leachate from SFE test exceeded the CWQG-FAL for Al concentrations.

4.2.4 Tailings

The sample BL1021-24D Detox Tls had carbonate NPR > 2 and was classified as non-PAG. The paste pH was 9.00 (Appendix B, Table B-8). The AP value (13.4 kg $CaCO_3$/t) is approximately 2.3x lower than the carbonate NP value (31.0 kg $CaCO_3$/t. No solid phase total metals exceeded 10× ACUC.

The sample BL1021-43 Detox Tls had carbonate NPR > 2 and was classified as non-PAG. The paste pH was 9.23 (Appendix B, Table B-8). The AP value (5.3 kg $CaCO_3$/t) is approximately 6.5x lower than the carbonate NP value (34.7 kg $CaCO_3$/t). No solid phase total metals exceeded 10× ACUC.

4.3 KINETIC TESTS

A summary of the HCT release rates to May 16, 2023, are presented in Appendix B, Table B-11. Release rates have not stabilized for many parameters, suggesting ongoing geochemical evolution in many of the samples, therefore, preliminary results are provided herein. Data analysis and interpretation of the HCTs will be completed after the HCTs are well flushed and the tests have stabilized for the prediction of primary reaction rates. The next reporting phase will include stabilized metal release rates, the calculation of depletion times for acid generating, acid neutralizing and metal leaching minerals, and the prediction of future geochemical conditions.

4.3.1 Overburden

4.3.1.1 Overburden: B OB-ML

In the first 20 weeks of the HCT, pH remained circumneutral between pH 6.6 and 7.3, and alkalinity release rates appear to have stabilized. Sulphate release rates declined over the testing period, with the rate at or near a stable release rate by week 20.

Of the POPCs identified by the SFE screening, F appears to have stable release rates at week 20, whereas release rates of Al, As, Cd, Cu, Fe, Mn, Ni, Pb, and Se and Zn have not yet stabilized (Appendix C, Figure C-1).

4.3.2 Waste Rock

A summary of the HCT release rates to May 16, 2023, are presented in Appendix B, Table B-11. Release rates had not stabilized for many parameters, suggesting ongoing geochemical evolution. The pH of HCT leachate from waste rock samples is near neutral to alkaline (excluding carbonate-depleted cells) with the lowest pH value of 6.61 observed in the B OB-ML cell.

4.3.2.1 Quartz Porphyry: B QPOR and B QPOR-PAG

Values of pH were circum-neutral to slightly alkaline (pH 7.0 - 9.0). Alkalinity release rates for B QPOR and B QPOR-PAG HCTs decline from week 1 through week 20 and have not yet stabilized. Sulphate release rates declined from a maximum in week 1 to week 12 and appear to be increasing from week 12 to week 20, suggesting ongoing sulphide oxidation (Appendix C, Figure C-1).

Of the POPCs identified by SFEs, the release rate of F appears to have stabilized by week 20, and As and Zn may have stabilized or are declining. The remaining POPCs identified by SFE tests have release rates that have not yet stabilized (Appendix C, Figure C-1).

4.3.2.2 Quartz Porphyry: B QPOR-PAG-CO3DP

The 12 weeks of data available for the carbonate-depleted QPOR-PAG-CO3DP HCT indicate acidic pH (4.6 - 5.4) and negligible alkalinity in leachate, due to the removal of carbonates prior to testing. Sulphate release rates suggest ongoing sulphide mineral oxidation that may be increasing (Appendix C, Figure C-1).

Of the POPCs identified in the SFEs, release rates of all parameters in the HCT are increasing at week 12. Copper and Ni, not identified as POPCs by static testing, have release rates at week 12 approximately double that of week 8 and should continue to be monitored and evaluated (Appendix C, Figure C-1).

4.3.2.3 Sediments: B SED and B SED-High SFE

Values of pH from the B SED and B SED-High SFE HCTs are more variable than the other waster rock lithologies but remain neutral to alkaline (7.3 – 9.2 and 7.3 – 8.9, respectively). Alkalinity release rates in both HCTs continue to decline at week 20. Sulphate release rates may be stabilizing or slightly increasing, with rates approximately double in the B SED-High SFE HCT than B SED at week 20 (Appendix C, Figure C-1).

Of the POPCs identified by SFE screening of individual SED samples, F and Fe release rates appear to be stable whereas As and Cd are fluctuating. Release rates of Al are fluctuating in B SED but appear to have stabilized in B SED-High SFE by week 20. Release rates of Mo steadily decline in cell B SED-High SFE to week 16 and then fluctuate to week 20; Mo release rates fluctuate in cell B SED throughout the 20 weeks of testing (Appendix C, Figure C-1).

4.3.2.4 Mafic dykes: B MD

The pH from the B MD HCT remains circumneutral to alkaline (7.2 – 8.9), and alkalinity is decreasing for the 20 weeks the HCTs have been operating. Suphate release rates decreased to week 12 but are fluctuating and possibly increasing through week 20 (Appendix C, Figure C-1).

Of the POPCs identified by SFEs and solid phase total metals of MD samples, HCT release rates of F appear to be stable; Al, Mn and Zn may be fluctuating or decreasing, and As and Cd are fluctuating or increasing by week 20 (Appendix C, Figure C-1).

4.3.2.5 Non-ore vein zones: B QTP and B QTP-PAG

Like the other waste rock lithologies, the pH of the B QTP and B QTP-PAG HCTs remain circumneutral through week 20 (7.0 – 8.9 and 6.9 – 8.4, respectively), alkalinity release rates generally decrease, and sulphate release rates may be stabilizing or slightly increasing (Appendix C, Figure C-1).

Of the POPCs identified by SFEs and solid phase total metals concentrations of the QTP individual and composite samples, the release rates from the B QTP and QTP-PAG for F have stabilized and Al are fluctuating but possibly decreasing at week 20. Release rates of Cd have greater variability in the B QTP-PAG HCT compared to the B QTP cell (Appendix C, Figure C-1).

4.3.2.6 Carbonate depleted non-ore vein zones: B QTP-PAG-CO3DP

Through the 12 weeks of testing, leachate from the carbonate-depleted HCT QPT-PAG-CO3DP remains acidic (pH 4.6 – 5.4). The negligible alkalinity release rates were based on <DL alkalinity concentrations and are indicative of the carbonate-depletion pre-treatment of the HCT cell charges. Sulphate release rates suggest ongoing sulphide oxidation and may be increasing at week 12 (Appendix C, Figure C-1).

Of the POPCs identified by static testing of the non-carbonate depleted QTP lithologies, release rates of F appear to be stable, Aluminum and Cd were increasing at week 12. Release rates of Cu, and Ni, not identified as a POPCs by static testing, increased at week 12 in the B QTP-PAG-CO3DP cell (Appendix C, Figure C-1).

4.3.3 Low-Grade and High-Grade Ore

4.3.3.1 Low grade ore: B LGO and B LGO-PAG and B LGO-PAG-CO3DP

Leachate from the low-grade ore HCTs B LGO and B LGO-PAG remain circumneutral to slightly alkaline through the 20 weeks of testing (pH 7.0 – 9.0, and pH 6.9 – 8.2, respectively), whereas leachate from the carbonate-depleted B LGO-PAG-CO3DP cell remains acidic (pH 4.1 – 5.1) for the 12 weeks of testing. Alkalinity release rates from B LGO decrease over the 20 weeks of testing, whereas release rates from B LGO-PAG are more variable and increase from weeks 16 through 20. Alkalinity remains low based on alkalinity concentrations <DL for B LGO-PAG-CO3DP due to leaching of the carbonate phases before HCT testing (Appendix C, Figure C-2).

Sulphate release rates are generally decreasing, but fluctuate, with rates approximately 6x higher in the B LGO-PAG HCT compared to B LGO at week 20. Sulphate release rates are increasing in the carbonate depleted cell B LGO-PAG-CO3DP, and at week 12 are approximate 36x higher than those from cell B LGO, and approximately 6x higher than observed in cell B LGO-PAG (Appendix C, Figure C-2).

Of the POPCs identified by static testing of LGO samples, Al release rates are sharply increasing at weeks 8 and 12 for cell B LGO-PAG-CO3DP to approximately 5 – 7x the B LGO and B LGO-PAG rates at week 8, respectively, and 20 – 70x the B LGO and B LGO-PAG rates, respectively. Release rates of As are variable for all three HCTs, but are higher and increasing for the B LGO-PAG-CO3DP HCT at week 12, compared to the other two cells. The Ag release rates are low and stable for all three cells as a result of Ag concentrations being <DL for all weeks. Release rates for Zn from B LGO-PAG-CO3DP decrease initially, then increase in weeks 8 and 12; the week 8 release rates were 7 – 10x in the B LGO-PAG CO3DP HCT compared to the B LGO and B LGO-PAG HCTs, respectively (Appendix C, Figure C-2).

4.3.3.2 High grade ore: B HGO, B HGO-PAG and B LGO-PAG-Zn-CO3DP

Similar to the low-grade ore HCTs, the high-grade ore HCTs B HGO and B HGO-PAG remain circumneutral to alkaline through the 20 weeks of testing (pH 7.0 – 8.7, and pH 6.8 – 8.5, respectively), whereas the carbonate-depleted B HGO-PAG-Zn-CO3DP cell remain acidic (pH 4.6 – 6.0) for the 12 weeks of testing. Alkalinity release rates from B HGO and B HGO-PAG decrease from week 2 to week 20 week. Alkalinity release rates remain low based on alkalinity concentrations <DL for B HGO-PAG-Zn-CO3DP due to leaching of the carbonate phases before HCT testing (Appendix C, Figure C-2).

Sulphate release rates are generally decreasing, however, fluctuated over the 20 weeks for HCTs B HGO and B HGO-PAG. Sulphate release rates are increasing in the carbonate depleted cell B HGO-PAG-Zn-CO3DP, and at week 12 are approximately 7 – 10x higher than those from cell B HGO-PAG and cell B HGO, respectively (Appendix C, Figure C-2).

The only POPC identified from screening of the static test results was Al. Aluminum release rates generally decrease, but fluctuate, for the 20 weeks of testing of B HGO and B HGO-PAG. The Al release rates from B HGO-PAG-Zn-CO3DP were lower than those of the other two HGO HCTs, but increase at week 12 (Appendix C, Figure C-2).

4.3.4 Tailings

4.3.4.1 Ageing

Tailings ageing tests were completed up to 56 days then terminated. These tests were for BL1021-43 Detox Tls which had MDMER exceedances for total cyanide ($CN_{(T)}$) and Cu, and CWQG-FAL exceedances for F, weak-acid dissociable cyanide (CN_{WAD}), total ammonia (NH_3+NH_4), Hg, Ag, Fe, phosphorus (P) and Zn for the 56-day testing period (Appendix B, Table B-12).

Nitrogen species generally decreased by the end of the ageing tests. $CN_{(T)}$ peaks on Day 14 (73 mg/L) and decreases below the MDMER threshold on Day 56. CN_{WAD} follows a similar trend, with the highest concentration (11 mg/L) at Day 28, sharply decreasing on Day 56 (0.02 mg/L). NH_3+NH_4 increases from Day 0 (2.8 mg/L) to Day 56 (10 mg/L), with the last concentration 20x the CWQG. Un-ionized ammonia peaked at Day 56 at 9x the CWQG (0.14 mg/L).

Table B-12 provides detailed results for all parameters with key parameters summarized herein. Cu exceeds MDMER from Day 0 (2x) to Day 28 (maximum 6.9 mg/L on Day 28), and the Day 56 concentration (0.027 mg/L) exceeds CWQG-FAL by 14x. Fe concentrations from Day 0 to Day 14 are more than 10x higher than the CWQG-FAL (up to 77x on Day 0), but remain below the CWQG-FAL threshold from Day 28 to Day 56. There is no clear trend in P concentrations, with a maximum concentration of 0.0080 mg/L (2x the CWQG) on Day 0 and Day 56. Hg concentrations have no clear trends, with a maximum concentration on Day 7 (0.00044 mg/L) 17x the CWQG. Ag concentrations were also variable, with the maximum value on Day 7 (0.00062 mg/L) 2.5x above the CWQG-FAL threshold. Recorded pH values are above neutral with a minimum pH value of 7.56 on Day 56.

4.3.4.2 Sub-Aqueous Columns

Results for 12 weeks of the HCT BL1021-43 Detox Tls were available at the time of this report preparation. The pH remained alkaline (pH 7.7 – 8.0), and alkalinity release rates increase to week 8 before decreasing to week 12. Sulphate release rates increase to week 4 then decrease to week 12 (Appendix C, Figure C-3).

SFEs were not conducted on these tailings samples, and no solid phase total metal concentrations exceeded the POPC screening criterion of 10x ACUC. However, unlike the HCTs representing unsaturated conditions, concentrations from subaqueous kinetic testing were used as screening criteria for POPCs (Table 5-1; Appendix B, Table B-12). Concentrations from the subaqueous HCT leachate were screened against MDMER and CWQG.

Concentrations in HCT leachate to week 12 from BL1021-43 Detox Tls exceed MDMER for $CN_{(T)}$ (up to 62x) and Cu (up to 27x), and exceeded CWQG-FAL for F (up to 1.3x), CN_{WAD} (up to 460x), NH_3+NH_4 (up to 15x), unionized ammonia (NH_3) (up to 17.5x), Hg (up to 11x), Ag (up to 9.2x), As (up to 2.4x), Cd (up to 13x), Cr (up to 1.7x), Fe (up to 43x), Mn (up to 1.2x), P (up to 30x), Se (up to 11x), and Zn (up to 16x) (Appendix B, Table B-12).

Release rates for $CN_{(T)}$ increase to week 8 and then decrease to week 12, whereas release rates for both $CN_{(WAD)}$, NH_3+NH_4 and unionized ammonia increase to week 4 before decreasing to week 12. Release rates for As, P and Se each increase by approximately 5x from week 8 to week 12, and release rates for Cd increase approximately 9x from week 8 to week 12. Release rates for Hg are variable, as a result of some concentrations in the HCT leachate being <DL. Release rates for Ag decrease from week 1 to week 12 and release rates for Zn decrease from week 2 to week 12. Release rates for Cr and Fe increase from week 2 to week 8 and then decrease to week 12, and release rates for Cu increase form to week 2 before decreasing to week 12. Release rates for Mn increased steadily form week 1 to week 12 (Appendix C, Figure C-3).

5.0 DISCUSSION

5.1 OVERBURDEN

Approximately 8.5 Mt of overburden will be excavated from the Berry pit and stockpiled. Overburden is non-PAG, with all 30 samples having a carbonate NPR greater than 2. The SFE tests suggest slightly acidic to alkaline pH values. Moderate leaching potential for F, Al, As, Cd, Cu, Fe, Mn, Ni, Pb, Se and Zn are based on SFE leachate concentrations that exceeded the CWQG-FAL (Table 5-1).

Table 5-1 Summary of Parameters of Potential Concern for the Materials from the Berry Pit

POPC	Berry Pit									
Lithology	OB	QPOR	SED	MD	QTP	LGO	HGO	Tailings (BL1021-43 Detox Tls)		Count
Sample type	Individ, Comp	Individ, Comp	Individ, Comp	Individ, Comp	Individ, Comp	Individ, Comp	Individ, Comp	Comp - Ageing	Comp - Sub-Aq	
F	×	×	×	×	×		×	✓	✓	8
$CN_{(T)}$								✓	✓	2
CN_{WAD}								✓	✓	2
NH_3+NH_4								✓	✓	2
Un-ion. NH_3									✓	1
Hg								✓	✓	2
Ag								✓	✓	2
Al	×	×	×	×	×	×	×			7
As	×	×	×	×		×			✓	6
Cd	×		×						✓	3
Cr									✓	1
Cu	×	×						✓	✓	4
Fe	×	×	×				×	✓	✓	6
Mn	×						×		✓	3
Mo			×							1
Ni	×									1
P								✓	✓	2
Pb	×						×		✓	3
Se	×		×				×		✓	4
Zn	×	×	×	×		×	×	✓	✓	8

Notes:
Sub-Aq - Sub-Aqueous.
× Shake Flask Extraction (SFE) exceedance in one or more tests; ✓ Aging tests in one or more weeks
Orange cells - parameter exceeds MDMER, thus classified as high potential for ML
Gray cells - parameter exceeds 10 x CWQG, thus classified as high potential for ML
Unhighlighted SFE symbols – parameter exceeds CWQG, thus classified as moderate potential for ML.
SFE data from individual samples

5.2 WASTE ROCK

Approximately 160.5 Mt of waste rock will be mined from the Berry pit. A conservative estimate of 11% of the total waste rock tonnage designated as PAG is based on samples with Carbonate NPR < 2. PAG rock is associated with all lithological units in the Berry Pit.

There are no exceedances of MDMER limits observed in SFE leachate. The SFE leachate of waste rock material exceeds CWQG-FAL concentrations, which is considered moderate leaching potential, for F, Al, As, Cd, Cu, Fe, Mo, and Zn (Table 5-1; Appendix B, Table B-4).

5.2.1 ARD/ML Management

The ARD/ML management strategy for Berry pit materials will be reviewed when HCT concentrations have stabilized, and release rates can be calculated and evaluated. Results from the muti-year FBL tests should be reviewed annually to monitor the *in situ* development of leachate quality. This data should be used to review and revise, as necessary, ARD/ML management strategy.

Based on the relatively small percentage of PAG rock from the Berry pit, and the excess of NP in the majority of Berry pit waste rock, Stantec recommends blending PAG and non-PAG rock with subsequent encapsulation of the blended material within non-PAG rock as shown on Figure A-12 (Appendix A). This approach has been successfully applied to waste rock piles development in other mine sites as referenced in Sections 6.6.3.5 and 6.6.3.6 of Global ARD guide (http://www.gardguide.com/index.php; INAP, 2009, and is applicable to ARD/ML management for the Project Expansion. The water quality predictions will be verified by monitoring, which is discussed in the ARD/ML Management Plan in detail (Stantec 2023b). If testing of contact water discharge quality from overburden stockpiles exceed trigger levels identified in Section 4.2 of the ARD/ML Management Plan, the adaptive management protocol will be implemented to address the drainage water quality issue.

5.3 CONSTRUCTION MATERIAL

Rock used for construction will primarily be sourced from waste rock generated during development of the open pit. Waste rock types have been characterized with respect to ARD potential as described in Section 5.2. The characterization indicates that the non-PAG lithologies with low ML should be acceptable sources of construction materials. Sources of rock will be tested and further evaluated prior to use in construction.

5.4 LOW-GRADE ORE

Analysis of individual LGO samples indicate that 40% classify as PAG. The composite sample representative of average LGO samples (B LGO) was also determined to be PAG. Estimated time of NP depletion time was calculated on HCT data (to week 19) before releases had stabilized and should be revised with additional data. The LGO has moderate leaching potential of Ag, Al, As and Zn based on CWQG-FAL exceedances in SFE leachate (Table 5-1; Appendix B, Table B-4).

5.4.1 ARD/ML Management

Based on an overall low risk of ARD/ML in LGO from the Berry pit, no mitigation is currently anticipated for the LGO stockpile at Berry site. However, to reduce ARD/ML risks, non-PAG LGO will be preferentially stockpiled, while PAG LGO will be directed to the mill feed as soon as practicable, as long as the grade requirement for the mill feed is met. Additionally, contact water will be collected in a sedimentation pond and monitoring will be conducted as part of the ARD/ML Management Plan to continually evaluate the ARD/ML risk and any necessary mitigation measures.

5.5 HIGH-GRADE ORE

Based on the analysis of individual samples, 58% of Berry HGO is conservatively (Carbonate NPR < 2) classified as PAG. The composite sample of Berry HGO (B HGO) was determined to be PAG. The estimated time of NP depletion time was calculated on HCT data (to week 19), before releases had stabilized, and should be revised with additional data.

No parameters were identified as having a high leaching potential because no exceedances of the MDMER limits were observed in SFE leachate. The HGO has a moderate leaching potential for F, Al, Cd, Fe, Mn, Pb, Se and Zn based on CWQG-FAL exceedances in SFE leachate (Table 5-1; Appendix B, Table B-4).

5.5.1 ARD/ML Management

High-grade ore from the Berry pit will be stockpiled with Marathon and Leprechaun HGO within the HGO stockpile to the southeast of the Berry Pit Complex. To limit exposure of PAG HGO within the stockpile, this ore can be preferentially directed to the mill feed, while non-PAG HGO can be allocated to the stockpile, as long as the grade requirement for the mill feed is met. The HGO stockpile will only be operated from Mine Year 1 to Mine Year 10, after which the stockpile will be decommissioned (Golder 2022). The HGO stockpile will be placed on an engineered pad with a runoff collection system. During operations, drainage from the HGO stockpile would flow by gravity to the tailings pond. If acidity were generated in the stockpile, the acidity would be neutralized in the tailings pond or in the mill during processing. Potential ML will be also addressed by treatment of effluent from the tailings pond as discussed in the Section 5.6.

5.6 TAILINGS

Tailings slurry from the Berry pit will be deposited in the TMF during the first nine years of operation and then to the Berry pit until cessation of the milling operation (15.5 Mt of tailings). Composite samples of tailings classify as non-PAG and are not expected to generate ARD. Preferential settling of denser minerals, such as sulphides, near spigots may result in formation of heterogeneous areas with PAG potential. The TMF surface will have water cover and beach areas during operations. The TMF will be rehabilitated at closure by placement of a soil and overburden cover, reducing the risk of localized ARD/ML during post closure (Ausenco 2020; Stantec 2023a).

During the operation stage, the tailings pond will receive discharge from the plant as represented by Day 0 of the tailing aging tests, runoff from tailings beaches as evaluated by the humidity cell tests, and collected seepage simulated by the sub-aqueous columns. Based on the exceedances of the MDMER limits for the tailings testing, $CN_{(T)}$ and Cu are considered to have a high potential of leaching, and treatment may be required during operation as described in the Water Management Plan (Stantec 2023c). The parameters F, $CN_{WAD,}$ NH_3+NH_4, unionized NH_3, Hg, Ag, As, Cd, Cr, Fe, Mn, P, Pb, Se, and Zn (Table 5-1) are considered to have a moderate leaching potential based on CWQG-FAL exceedances in the available sub-aqueous data.

5.7 OPEN PITS

Materials characterized as PAG will be exposed in the pit walls during operations, but the majority of these materials are not expected to generate ARD before the pits are backfill with waste rock and flooded during the mine closure period based on ARD onset estimates (Tables B-8 and B-24, Appendix B). However, some lithologies were assessed as having moderate leaching potential for a number of parameters in the testing conducted to date. In post-closure, only materials within the highwall above the permanent level of the pit lake will remain exposed. Exposed rock types in the Berry pit are mostly represented by sediments (conglomerates) that show low ARD potential but moderate leaching potential for a number of parameters, based on testing completed to date. Pit materials will be characterized as part of confirmatory testing during operation. Monitoring of mine water will verify the water quality predictions and provide information for updates of the pit water quality model to inform closure strategies.

The parameters Cu, unionized and total NH_3, and total and free CN were assessed as a moderate leaching potential, and the discharge of tailings slurry and overflow from the tailings pond may affect pit lake concentrations. Concentrations of these parameters would be expected to decline during pit lake filling as a result of dilution by groundwater and/or attenuation. Analyzing the additional, stabilized, HCT data, water quality modelling, and monitoring of mine water during operations and closure will be used to review and revise the assessment of pit lake water quality. Accelerated pit filling and maintaining stratification of pit lakes are major controls of ARD/ML currently considered for long-term pit lake management.

6.0 CONCLUSIONS

Overburden from the Berry pit is classified as non-PAG (Carbonate NPR > 2). If PAG overburden is identified by confirmation testing, it will be segregated and placed in the waste rock pile in accordance with the management protocols for PAG waste rock to limit potential for ARD.

The waste rock excavated and stockpiled from the Berry pit is estimated to contain up to 11% PAG material. For waste rock used as construction material, Stantec recommends targeting non-PAG lithologies and conducting confirmatory testing prior to use. For waste rock that will be stockpiled, PAG and non-PAG rock will be blended to form a non-PAG blend and subsequently encapsulated within non-PAG rock. Closure of the waste rock pile will include a soil/overburden/topsoil cover and revegetation to potentially reduce the ARD/ML risk as described in the Rehabilitation and Closure Plan for the Approved Project.

Approximately 40% of LGO is estimated to be PAG, however, because of the short duration of the LGO stockpile no mitigation is currently recommended for the LGO stockpile, with the exception of the collection of contact water prior to discharge. To reduce ARD/ML risks, non-PAG LGO will be preferentially stockpiled, while PAG LGO will be directed to the mill feed as soon as practicable, as long as the grade requirement for the mill feed is met.

Fifty-eight percent of Berry HGO is conservatively classified as PAG (Carbonate NPR<2). The composite sample of Berry HGO (B HGO) was determined to be PAG. High-grade ore from the Berry pit will be stockpiled with Marathon and Leprechaun HGO within the Berry Pit. To limit exposure of PAG HGO within the stockpile, this ore can be preferentially directed to the mill feed, while non-PAG HGO can be allocated to the stockpile, as long as the grade requirement for the mill feed is met.

Composite samples of tailings are classified as non-PAG and are not expected to generate ARD. Tailings from ore extracted from the Berry pit will be deposited in the TMF with some areas of water cover and beaches during operations, and a soil/overburden cover post closure. Elevated concentrations of $CN_{(T)}$, un-ionized NH_3, and Cu suggested in the Berry tailings may impact pit water quality. Active water treatment is currently included in the Project design to mitigate elevated concentrations.

Site specific recommendations for ARD/ML prevention, mitigation, and management including practical considerations for the Approved Project regarding storage, handling, and long-term disposal of residual ore, waste rock, and tailings are provided in the ARD/ML Management Plan. The ARD/ML Management Plan contains additional details on testing of materials, monitoring of contact water and mitigations including contingency actions to control ARD/ML (Stantec 2023b) and will be updated to include the Project Expansion.

7.0 STATEMENT OF QUALIFICATIONS

This report is written by staff under the supervision of Dr. Brenda L. Bailey, a Senior Associate - Geochemist with Stantec. Dr. Bailey received a master's degree in Earth Sciences in 2005 from Carleton University and Ph.D. from University of Waterloo in 2013. Dr. Bailey has over 18 years of professional and research experience in the environmental geoscience fields of contaminated sites, hydrogeochemistry, and metal leaching and acid rock drainage (ML/ARD) prediction, prevention, and mitigation. She has worked in coal, and hard-rock mining for projects in North and South America, and United Kingdom. Dr. Bailey has experience in the development and review of water quality and mine waste environmental management, monitoring, and mitigation programs for numerous mine projects in all phases of the mine life: baseline environmental assessment, permitting, operations, and closure. As a Senior Geochemist she focuses on water quality and mine waste aspects of mining projects, including ML/ARD characterization; mine water management plans, waste rock and tailings geochemical and microbiological assessments; scale-up predictions; water quality modelling; and mobility and fate of contaminants. Dr. Bailey is a register geoscience professional in Newfoundland and Labrador, British Columbia, Ontario, and Northwest Territories/Nunavut.

Quality review of this report was conducted by Dr. Jim B. Finley, a Principal Geochemist with Stantec. Dr. Finley has over 25 years of experience in the application of geochemical and hydrological principles to address water quality and management issues in a variety of environments associated with natural resource extraction and use. He has worked in coal, uranium, and hard-rock mining for his consulting career completing projects in North and South America, New Zealand, and Australia. He has extensive experience in mining at all phases of the mine life cycle from baseline work in support of permitting, active agency interaction, preparation of EIS/EIA documents, support for active mine operations, and participation of analysis and design for reclamation and closure of mines. Dr. Finley has expertise in the following technical areas: aqueous geochemistry, geochemical modeling, isotope geochemistry and hydrology, trace metal chemistry, watershed hydrology, and dynamic systems modeling.

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Stantec Consulting Ltd. (Stantec). 2023c. Berry Pit Expansion Project Water Management Plan. August 2023.

8.1 PERSONAL COMMUNICATIONS

Goode, John. 2019a (Goode and Associates). Email titled “Marathon Gold PFS - metallurgical data” sent on 7 Oct 2020 to Ruth Sherrit (Ausenco) and Jared Dietrich (Ausenco) and copied to Robbert Borst (Marathon Gold Corp.).

J.R. Goode and Associates (Goode and Associates). 2019b. Marathon Gold – Valentine Lake Gold project: Samples used in 2018-2019 metallurgical program (SGS project number 16863-01). Memorandum prepared by J.R. Goode and Associates for Robbert Borst, COO - Marathon Gold Corporation, 2019-10-03.

APPENDIX A

Figures

Existing Access Road
Proposed NL Hydro Power Line

Spatial Boundaries
Project Area
Mine Site

Other Features
Highway
Resource / Recreation Road
Transmission Line
Watercourse
Waterbody
Forested Area

0 5 10
Kilometres

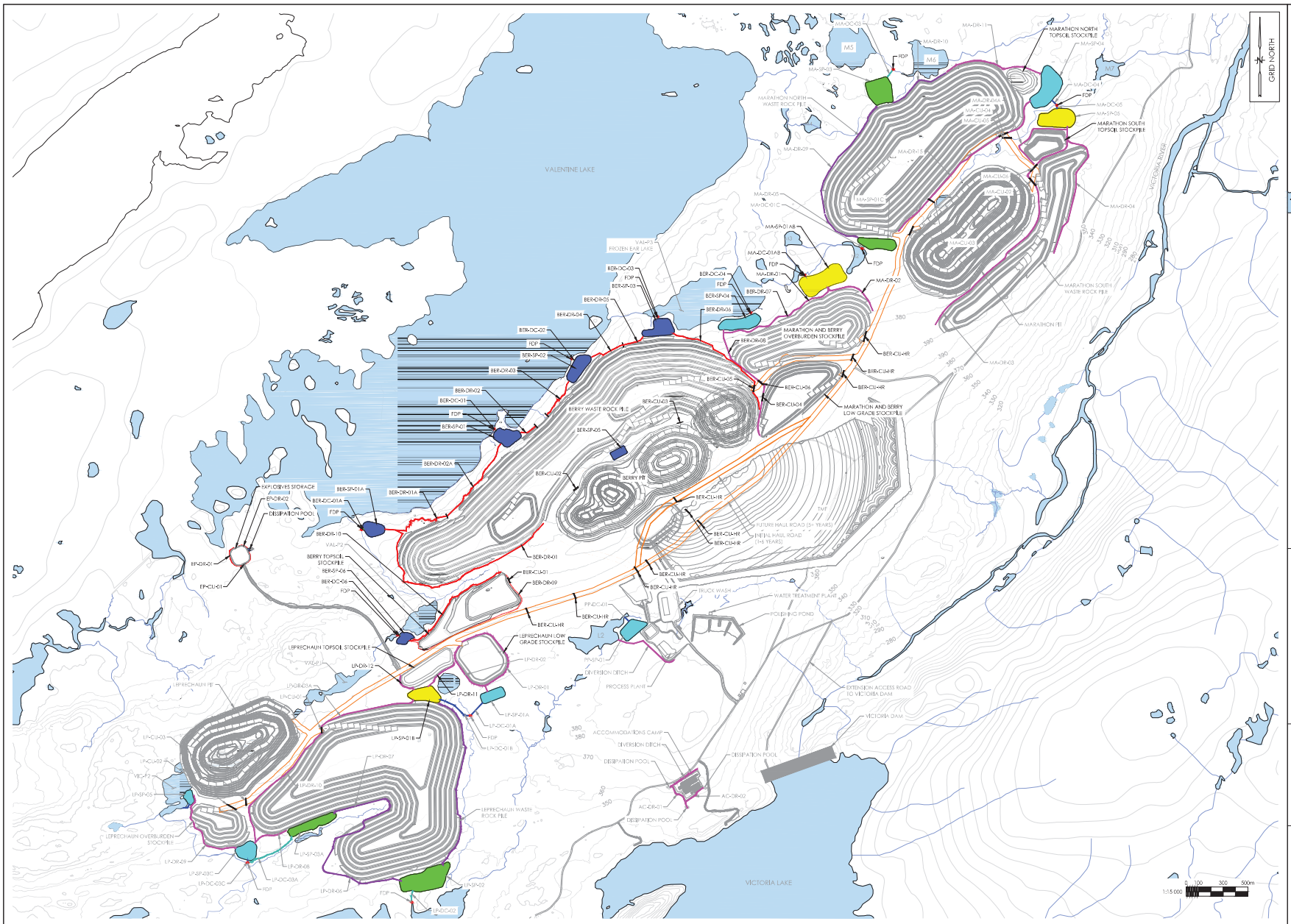
N

Stantec

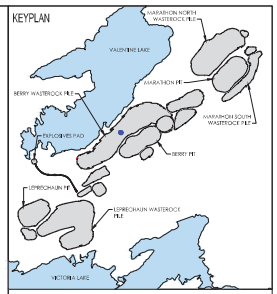
Project Location 12141357_005
Valentine Lake
Central Newfoundland, CA

Client/Project
Marathon Gold Corporation
Valentine Gold Project
Figure A-1 Project Location

Notes
1. Background: CanVec 1:250 000 data, Natural Resources Canada



KEYPLAN



LEGEND

EARLY WORKS WATER MANAGEMENT INFRASTRUCTURE
- EARLY WORKS POND
- EARLY WORKS DITCH
- EARLY WORKS DRAINAGE CHANNEL
- EARLY WORKS POND REQUIRES MODIFICATION FOR BERRY DEPOSIT

OPERATIONAL WATER MANAGEMENT INFRASTRUCTURE
- OPERATIONAL POND (FEASIBILITY LEVEL DESIGN)
- NOT PART OF EARLY WORKS DITCH
- NOT PART OF EARLY WORKS DRAINAGE CHANNEL

BERRY WATER MANAGEMENT INFRASTRUCTURE
- PROPOSED POND LOCATION (BERRY DEPOSIT)
- PROPOSED DITCH (BERRY DEPOSIT)
- PROPOSED DRAINAGE CHANNEL (BERRY DEPOSIT)
- HAUL ROAD
- PROPOSED ACCESS ROAD
- CULVERT
- CONTOURS, 10 m LIDAR
- FINAL DISCHARGE POINT (F.D.P.)
- WATERCOURSE
- WATERBODIES

ABBREVIATIONS

AC	ACCOMODATIONS CAMP
BER	BERRY
CU	CULVERT
DC	DRAINAGE CHANNEL
DR	DITCH RUN
EP	EXPLOSIVES PAD
HR	HAUL ROAD
LP	LEPRECHAUN
MA	MARATHON
PP	PROCESSING PLANT
SP	SEDIMENT POND

NOTES

1. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND NOT TO BE USED FOR OTHER PURPOSES.
2. LIDAR DERIVED CONTOURS (JUNE 6-7, 2019 (AETHON AERIAL SOLUTIONS); VERTICAL DATUM: CGVD28.
3. WATERCOURSES AND WATERBODIES: SURVEYED FISH BEARING OR HAS CONNECTIVITY TO FISH BEARING WATER (STANTEC 2012, 2019 & 2020, 2022). SUPPLEMENTED WITH CANVEC 2011 WATERCOURSES AND WATERBODIES.
4. ALL NON-WATER MANAGEMENT INFRASTRUCTURE DESIGN BY: AUSENCO, GOLDER & MOOSE MOUNTAIN TECHNICAL SERVICES DESIGN.
5. COORDINATES ARE NAD83(CSRS) UTM ZONE 21.
6. WATER MANAGEMENT DESIGN IS BASED ON LIMITED TESTPIT AND BOREHOLE DATA (GEMTEC, 2020 / 2021 / 2022). IF SITE CONDITIONS ARE DIFFERENT THAN THOSE SHOWN ON THIS DRAWING, THE CONTRACTOR IS TO NOTIFY THE ENGINEER OF RECORD AND CLIENT PRIOR TO PROCEEDING WITH CONSTRUCTION.

PERMIT

SEAL

SEAL

DRAWING No.	REFERENCE DRAWING	Rev	BY	DATE	REVISION DETAILS	CHKD	ENG	APPR	CLNT
		0	C.P.	03/03/2023	ENVIRONMENT PERMITTING BERRY F.S. DESIGN	A.V.	R.J.	S.B.	M.G.

DRAWN	CP/JL	03/03-2023
CHECKED	SB	03/03-2023
DESIGNED	RJ/SB	03/03-2023
DES. APPR	RJ/SB	-
PROJ APPR	SS	-
CLIENT APPR	-	-

MARATHON GOLD

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St. John's NL
Tel. (709) 576-1458
www.stantec.com

Stantec

PROJECT VALENTINE GOLD PROJECT
FEASIBILITY LEVEL STUDY- WATER MANAGEMENT DESIGN

TITLE
BERRY WATER MANAGEMENT INFRASTRUCTURE

PROJECT No	SCALE	SIZE
121620514	AS SHOWN	ARCH D

Figure no.: A-2

REV 0

121620345

Mar 13,2023 - 11:28am Z:\121620\active\121620514\5_CAD\sheet_files\2023-03-23-EA-GENERAL_ARRANGEMENT\20514_001_BERRY_EA_SITE_PLAN.dwg - cophillips

APPENDIX B

Tables

Table B-1: Description of composite samples

Composite ID	Lithological Description
B QPOR	Composite of Average Samples of Quartz Porphyry unit
B SED	Composite of Average Samples of Sedimentary unit
B MD	Composite of Average Samples of Mafic Dyke unit
B QTP	Composite of Average Samples of Quartz-Tourmaline-Pyrite veins
B LGO	Composite of Average Samples of Low-Grade Ore
B HGO	Composite of Average Samples of High-Grade Ore
B QPOR-PAG	Composite of Quartz Porphyry samples that are classified as PAG
B SED-High SFE	Composite of Sedimentary unit samples with exceedances in SFE tests
B QTP-PAG	Composite of Quartz-Tourmaline-Pyrite vein samples that are classified as PAG
B LGO-PAG	Composite of Low-Grade Ore samples that are classified as PAG
B HGO-PAG-Zn	Composite of High-Grade Ore samples that are classified as PAG and have Zn exceedances
B OB-ML	Composite of Overburden samples with exceedances in SFE tests
B QPOR-PAG-CO3DP	Carbonate-depleted composite of Quartz Porphyry samples that are classified as PAG
B QTP-PAG-CO3DP	Carbonate-depleted composite of Quartz-Tourmaline-Pyrite vein samples that are classified as PAG
B LGO-PAG-CO3DP	Carbonate-depleted composite of Low-Grade Ore samples that are classified as PAG
B HGO-PAG-Zn-CO3DP	Carbonate-depleted composite of High-Grade Ore samples that are classified as PAG and have Zn exceedances
B-QPOR_FB	Composite of Quartz Porphyry unit samples
B-CG_FB	Composite of Sedimentary unit samples
B-MD_FB	Composite of Average Mafic Dyke unit samples
B-QTP_FB	Composite of Quartz-Tourmaline-Pyrite vein samples
B-LGO_FB	Composite of Low-Grade Ore samples
B-HGO_FB	Composite of High-Grade Ore samples
BL1021-24D Detox Tls	Tailings from the Berry Pit
BL1021-43 Detox Tls	Tailings from the Berry Pit

Table B-2: Description of kinetic tests

Material	Sampe ID	Test type	Start	Finish	No. of weeks/days
Waste Rock	B QPOR	Humidity Cell	22/12/2022	Ongoing	19 weeks
Waste Rock	B SED	Humidity Cell	22/12/2022	Ongoing	19 weeks
Waste Rock	B MD	Humidity Cell	22/12/2022	Ongoing	19 weeks
Waste Rock	B QTP	Humidity Cell	22/12/2022	Ongoing	19 weeks
Low-Grade Ore	B LGO	Humidity Cell	22/12/2022	Ongoing	19 weeks
High-Grade Ore	B HGO	Humidity Cell	22/12/2022	Ongoing	19 weeks
Waste Rock	B QPOR-PAG	Humidity Cell	15/12/2022	Ongoing	20 weeks
Waste Rock	B SED-High SFE	Humidity Cell	15/12/2022	Ongoing	20 weeks
Waste Rock	B QTP-PAG	Humidity Cell	15/12/2022	Ongoing	20 weeks
Low-Grade Ore	B LGO-PAG	Humidity Cell	15/12/2022	Ongoing	20 weeks
High-Grade Ore	B HGO-PAG-Zn	Humidity Cell	15/12/2022	Ongoing	20 weeks
Waste Rock	B OB-ML	Humidity Cell	15/12/2022	Ongoing	20 weeks
Waste Rock	B QPOR-PAG-CO3DP	Humidity Cell	13/02/2023	Ongoing	11 weeks
Waste Rock	B QTP-PAG-CO3DP	Humidity Cell	13/02/2023	Ongoing	11 weeks
Low-Grade Ore	B LGO-PAG-CO3DP	Humidity Cell	13/02/2023	Ongoing	11 weeks
High-Grade Ore	B HGO-PAG-Zn-CO3DP	Humidity Cell	13/02/2023	Ongoing	11 weeks
Waste Rock	B-QPOR_FB	Field Bin	-	-	-
Waste Rock	B-CG_FB	Field Bin	-	-	-
Waste Rock	M-MD_FB	Field Bin	-	-	-
Waste Rock	B-QTP_FB	Field Bin	-	-	-
Low-Grade Ore	B-LGO_FB	Field Bin	-	-	-
High-Grade Ore	B-HGO_FB	Field Bin	-	-	-

Notes:

The number of weeks was calculated to May 16, 2023.

Table B-3: Mineralogical identification of composite samples of waste rock, ore and tailings

Sample ID	B OB-ML	B QPOR	B SED	B MD	B QTP	B LGO	B HGO	B QPOR-PAG	B SED-High SFE	B QTP-PAG	B LGO-PAG	B HGO-PAG-Zn	B QPOR-PAG-CO3DP	B QTP-PAG-CO3DP	B LGO-PAG-CO3DP	B HGO-PAG-Zn-CO3DP	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Mineral Mass (wt %)																		
Method	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	XRD	QMA	QMA
Quartz	37.6	48.8	42.3	42.0	47.8	46.8	49.7	45.0	51.8	47.9	59.9	62.0	50.2	43.1	60.5	61.0	48.8	46.4
Alkali feldspar (Microcline / Orthoclase)	0.6	2.7	1.2	2.1	1.5	1.7	2.0	0.9	1.4	1.4	0.2	0.2	0.9	0.5	0.8	0.5		
Albite	36.3	33.4	12.4	19.7	37.0	32.7	35.3	39.3	13.0	37.1	17.7	29.2	38.1	44.3	19.5	29.0		
Plagioclase																	30.0	27.3
Other Silicates																	0.09	0.1
Calcite	0.00	-	3.2	5.7	1.1	2.8	1.8	1.00	4.0	3.4	2.1	1.5	0.09	0.05	0.09	0.12	3.5	4.3
Magnesian calcite	-	3.5	1.9	-	2.4	2.5	2.4	1.70	-	0.00	1.10	0.30	-	-	-	-		
Ankerite	0.5	-	3.9	0.6	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2
Pyrite/Marcasite*	0.2	0.3	0.1	0.3	0.4	1.2	1.1	1.2	0.2	1.4	6.9	1.1	1.3	1.4	6.4	1.2	1.0	1.3
Sphalerite																	0.0	0.0
Chalcopyrite																	0.01	0.01
Other Sulphides																	0.00	0.00
Diaspore	-	-	-	-	-	-	-	-	-	0.5	0.5	-	-	-	-	-		
Gibbsite	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-		
Fe-Oxides																	0.2	0.1
Hematite	-	-	0.7	0.5	-	-	-	-	-	-	-	-	-	-	-	-		
Magnetite	0.9	-	2.3	1.0	-	0.4	-	-	1.2	0.5	1.8	-	0.5	0.6	1.4	0.2	-	-
Actinolite	5.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chlorite	6.1	3.5	6.8	16.1	2.8	2.8	2.4	2.0	10.2	1.2	1.3	1.3	0.2	0.5	0.5	0.6	5.3	4.8
Muscovite / Sericite / Paragonite	12.5	6.7	23.2	10.9	6.4	9.2	4.9	7.4	16.8	5.3	7.7	4.0	6.6	9.2	10.5	7.1	5.6	6.1
Clays																	3.6	7.3
Anhydrite																	0.02	0.01
Apatite																	0.09	0.10
Rutile	-	-	0.7	0.9	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5
Stilpnomelane	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-		
Tourmaline	-	-	-	-	-	-	-	-	-	-	-	-	2.2	0.2	0.2	0.3	1.3	1.5
Zeolite (Laumontite)	-	1.2	1.3	-	0.7	-	0.5	1.4	1.4	1.2	0.8	0.4	-	-	-	-		
Other																	0.02	0.02
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Notes:

The values of mineral mass greater than 30%

The values of mineral mass greater than 10%

The values of mineral mass greater than 1%

Mineral identification is based on the SGS laboratory reports provided in Appendix D-1.

Method XRD indicated mineral quantities reported based on XRD with Rietveld refinement; method QMA indicates mineral quantities based on automated mineral quantification by the QEMSCAN system

*XRD identified pyrite only; QMA cannot distinguish between pyrite and marcasite and reports a combined total wt%

A blank cell indicates the mineral was not reported for the mineral identification method

Values of 0.0 indicate the mineral was included in XRD refinement calcuations but the calcuated concentration was <0.05 wt%

A dash (-) indicates the mineral was not identified by the analyst and not included in the XRD refinement calcuations

Table B-4: Number and Percentages of Samples from Berry Site Exceeding Selected ARD/ML Criteria

Parameter	Units	Criteria	1. QE-POR		2. Conglomerate		3. Mafic Dykes		4. QTP		5. Low-Grade Ore		6. High-Grade Ore		7. OB	
NPR ratio criteria			**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Acid-Base Accounting (ABA)			**108**	**100**	**83**	**100**	**42**	**100**	**30**	**100**	**32**	**100**	**85**	**100**	**30**	**100**
NPR	ratio	>1 <2	12	11	1	1	1	2	3	10	11	34	26	31	0	0
NPR	ratio	<1	8	7	0	0	0	0	3	10	2	6	23	27	0	0
MDMER Criteria			**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Shake Flask Extraction (SFE)			**51**	**100**	**42**	**100**	**22**	**100**	**14**	**100**	**16**	**100**	**44**	**100**	**45**	**100**
pH	pH unit	<6.0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
pH	pH unit	>9.5	0	0	0	0	0	0	0	0	0	0	0	0	1	2
As	mg/L	>0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cu	mg/L	>0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ni	mg/L	>0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pb	mg/L	>0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zn	mg/L	>0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CWQG Criteria			**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Shake Flask Extraction (SFE)			**51**	**100**	**42**	**100**	**22**	**100**	**14**	**100**	**16**	**100**	**44**	**100**	**45**	**100**
Final pH	pH unit	<6.5	0	0	0	0	0	0	0	0	0	0	0	0	4	9
Final pH	pH unit	>9.0	1	2	2	5	0	0	1	7	0	0	4	9	5	11
F	mg/L	>0.12	5	10	8	19	4	18	3	21	0	0	6	14	33	73
Ag	mg/L	>0.00025	0	0	0	0	0	0	0	0	1	6	0	0	0	0
Al	mg/L	>0.1	51	100	42	100	22	100	14	100	16	100	43	98	35	78
As	mg/L	>0.005	3	6	1	2	2	9	0	0	2	13	0	0	25	56
B	mg/L	>1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cd*	mg/L	>0.00004	0	0	2	5	0	0	2	14	0	0	2	5	8	18
Cr	mg/L	>0.0089	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cu*	mg/L	>0.002	2	4	0	0	0	0	0	0	0	0	0	0	26	58
Fe	mg/L	>0.3	3	6	3	7	0	0	0	0	0	0	3	7	15	33
Hg	mg/L	>0.000026	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mn*	mg/L	>0.19	0	0	0	0	0	0	0	0	0	0	1	2	8	18
Mo	mg/L	>0.073	0	0	1	2	0	0	0	0	0	0	0	0	0	0
Ni*	mg/L	>0.025	0	0	0	0	0	0	0	0	0	0	0	0	3	7
P	mg/L	>0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pb*	mg/L	>0.001	0	0	0	0	0	0	0	0	0	0	2	5	11	24
Se	mg/L	>0.001	0	0	0	0	0	0	0	0	0	0	1	2	10	22
Tl	mg/L	>0.0008	0	0	0	0	0	0	0	0	0	0	0	0	0	0
U	mg/L	>0.015	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zn*	mg/L	>0.0017	11	22	5	12	2	9	0	0	1	6	5	11	23	51
10 x ACUC Criteria			**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Trace Element Concentration (TEC)			**108**	**100**	**64**	**100**	**42**	**100**	**19**	**100**	**18**	**100**	**52**	**100**	**45**	**100**
Ag	µg/g	>530	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Al	µg/g	>407639	0	0	0	0	0	0	0	0	0	0	0	0	0	0
As	µg/g	>48	0	0	0	0	1	2	0	0	0	0	0	0	15	33
B	µg/g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Be	µg/g	>21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cd	µg/g	>0.9	4	4	0	0	1	2	1	5	0	0	2	4	0	0
Co	µg/g	>173	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cr	µg/g	>920	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cu	µg/g	>280	0	0	0	0	0	0	0	0	1	6	0	0	0	0
Fe	µg/g	>320415	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg	µg/g	>0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mn	µg/g	>774.5	11	10	44	69	33	79	2	11	2	11	5	10	31	69
Mo	µg/g	>11	0	0	1	2	0	0	0	0	0	0	0	0	0	0
Ni	µg/g	>470	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P	µg/g	>654.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pb	µg/g	>170	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Se	µg/g	>0.9	2	2	0	0	0	0	0	0	1	6	2	4	1	2
Tl	µg/g	>9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
U	µg/g	>27	0	0	0	0	0	0	0	0	0	0	0	0	0	0
V	µg/g	>970	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zn	µg/g	>670	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B-5: Summary of ABA Statistics for Materials from Berry Deposit

Parameter	Paste pH	S_{TOTAL}	$S_{SULPHATE}$	$S_{SULPHIDE}$	Modified Sobek NP	Lab AP	Lab NNP	Carb. NP	AP (calc)	Carbonate NNP	Carb. NPR	TC
ABA Criteria	-	-	-	-	-	-		-	-	-	**Less than 1; 1 to 2**	-
Units	pH Units	wt.%						kg $CaCO_3$/t			unit less	wt.%
1. Qtz-eye Porphyry (QE-POR), 108 samples												
Min	8.60	0.0025	0.020	0.020	1.3	1.3	-42.7	7.7	0.078	-45	**0.28**	0.093
10th, %ile	9.21	0.0043	0.020	0.020	18	1.3	3.6	19	0.13	7.2	**1.4**	0.22
Median	9.46	0.13	0.02	0.100	41	3.1	33.6	39	4.0	33	10	0.47
90th, %ile	9.72	0.91	0.06	0.946	72	31	58.4	67	28	59	290	0.80
Max	9.98	2.0	0.3	1.91	182	60	179.2	177	62	174	1771	2.1
Average	9.45	0.29	0.04	0.278	45	9.4	35.2	44	9.1	35	4.8	0.53
St. Dev.	0.24	0.40	0.04	0.405	28	13	31.9	27	13	31	247	0.32
2. Conglomerate (CG), 83 samples												
Min	8.92	0.0025	0.020	0.020	10	1.3	6.9	8.8	0.078	6.4	**1.8**	0.11
10th, %ile	9.24	0.0025	0.020	0.020	30	1.3	28.5	28	0.078	28	4.8	0.34
Median	9.49	0.0060	0.020	0.020	86	1.3	77.8	89	0.19	85	328	1.1
90th, %ile	9.80	0.20	0.04	0.154	157	4.8	155.4	162	6.2	162	1664	1.9
Max	10.02	1.1	0.1	1.08	218	34	216.8	200	35	199	2432	2.4
Average	9.50	0.10	0.02	0.097	88	3.5	84.7	90	3.0	87	30	1.1
St. Dev.	0.22	0.23	0.01	0.219	48	6.7	48.4	48	7.2	49	686	0.58
3. Mafic Dykes (MD), 42 samples												
Min	8.59	0.0025	0.020	0.020	27	1.3	25.6	24	0.078	22	**1.8**	0.29
10th, %ile	8.84	0.0051	0.020	0.020	52	1.3	44.4	48	0.16	39	5.1	0.58
Median	9.16	0.10	0.020	0.080	101	2.5	94.5	109	3.3	102	33	1.3
90th, %ile	9.49	0.46	0.09	0.398	202	12	198.2	215	14	209	400	2.6
Max	9.79	0.91	0.32	0.84	286	26	284.1	312	28	311	1995	3.7
Average	9.15	0.18	0.04	0.152	119	4.7	114.4	119	5.7	113	21	1.4
St. Dev.	0.27	0.22	0.05	0.192	62	5.6	63.0	66	6.8	68	427	0.79
4. Quartz-Tourmaline-Pyrite Veins in Lith (QTP), 30 samples												
Min	8.98	0.022	0.020	0.020	19	1.3	-0.3	18	0.69	-3.8	**0.88**	0.21
10th, %ile	9.23	0.036	0.020	0.020	25	1.3	14.5	25	1.1	11	**1.5**	0.30
Median	9.60	0.26	0.03	0.235	38	7.3	29.4	35	8	29	3.8	0.42
90th, %ile	9.76	0.99	0.15	0.83	55	26	42.6	52	31	38	27	0.63
Max	9.82	1.3	0.2	1.7	84	52	50.7	81	41	51	60	0.97
Average	9.55	0.40	0.06	0.38	40	12	27.7	38	12	25	3.0	0.46
St. Dev.	0.21	0.36	0.06	0.39	14	12	12.8	13	11	13	15	0.15
5. Low-Grade Ore (LGO), 32 samples												
Min	8.33	0.0025	0.020	0.020	7.6	1.3	-230.9	6.1	0.078	-278	**0.21**	0.073
10th, %ile	9.25	0.14	0.020	0.088	24	2.7	6.3	24	4.4	4.4	**1.1**	0.29
Median	9.50	0.37	0.060	0.30	38	9.2	23.2	38	11	21	2.9	0.46
90th, %ile	9.69	1.2	0.15	1.1	62	34	43.2	63	37	41	8.8	0.76
Max	9.87	11	1.5	9.6	86	301	48.3	83	350	46	499	1.0
Average	9.47	0.89	0.13	0.77	40	24	16.3	40	28	12	**1.4**	0.48
St. Dev.	0.27	2.0	0.27	1.7	17	53	47.6	17	62	55	89	0.20
6. High-Grade Ore (ORE), 85 samples												
Min	8.09	0.034	0.020	0.020	9.3	1.3	-258.6	8.3	1.1	-273	**0.03**	0.10
10th, %ile	8.94	0.18	0.020	0.096	22	3.8	-14.4	22	5.6	-18	**0.62**	0.26
Median	9.39	0.71	0.060	0.63	35	20	18.4	34	22	16	**1.6**	0.41
90th, %ile	9.70	1.7	0.21	1.5	78	46	48.1	74	52	47	9.2	0.88
Max	9.91	9.0	1.0	8.8	223	275	218.9	218	281	212	108	2.6
Average	9.36	0.95	0.10	0.86	45	27	17.6	44	30	14	**1.5**	0.53
St. Dev.	0.32	1.13	0.13	1.1	36	35	52.3	36	35	53	13	0.44
7. Overburden (OB), 30 samples												
Min	7.12	0.0025	0.020	0.020	2.9	1.3	1.7	9.1	0.078	7.8	6.5	0.11
10th, %ile	7.76	0.0025	0.020	0.020	7.1	1.3	5.8	9.4	0.078	9.3	48	0.11
Median	8.48	0.0025	0.020	0.020	8.6	1.3	7.3	16	0.078	16	139	0.19
90th, %ile	8.88	0.018	0.020	0.020	24	1.3	22.4	44	0.56	44	258	0.53
Max	8.93	0.045	0.040	0.020	42	1.3	40.5	61	1.4	61	389	0.73
Average	8.35	0.0073	0.021	0.020	12	1.3	10.7	21	0.23	20	91	0.25
St. Dev.	0.44	0.0089	0.0036	0	9.5	0	9.5	14	0.28	14	96	0.16

Notes:

Refer to Section 3.3.1 for definitions and calculations for NPR, NNP, Carb NP, AP, S_{TOTAL}, $S_{SULPHIDE}$, $S_{SULPHATE}$ and TC.

S_{TOTAL} - Total Sulphur;

$S_{SULPHIDE}$ - Sulphide Sulphur; $S_{SULPHIDE}=S_{TOTAL}-S_{SULPHATE}$.

$S_{SULPHATE}$ - Sulphate Sulphur;

Carb. NP - Carbonate Neutralization Potential; Carb. NP=TC*M($CaCO_3$)/M(C)*10(kg/t from % diff.)

AP (calc) - Acid Potential; AP=S_{TOTAL}(%) x 31.25.

NNP - Net Neutralization Potential;

NPR - Neutralization Potential Ratio;

TC - Total Carbon.

NPR values between 1 and 2 are bolded and below 1 are bolded and shaded; See text for assumptions and calculations;

For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters.

Table B-6: Summary of SFE Statistics for Materials from Berry Deposit

Parameter	pH	SO_4	F	Ag	Al	As	B	Cd*	Cr	Cu*	Fe	Hg	Mn*	Mo	Ni*	Pb*	Se	Tl	U	Zn*
MDMER	6.0-9.5	n/v	n/v	n/v	n/v	0.1	n/v	n/v	n/v	0.1	n/v	n/v	n/v	n/v	0.25	0.08	n/v	n/v	n/v	0.4
CWQG	6.5-9.0	n/v	0.12	0.00025	0.1	0.005	1.5	0.00004	0.0089	0.002	0.3	2.6E-05	0.19	0.073	0.025	0.001	0.001	0.0008	0.015	0.0017
Unit	pH Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1. Qtz-eye Porphyry (QE-POR), 51 samples																				
Min	7.61	1.0	0.030	0.000025	0.19	0.00040	0.0020	0.0000015	0.000040	0.00010	0.0035	-	0.00062	0.00026	0.000050	0.000045	0.000020	0.0000025	0.000014	0.0010
10th, %ile	7.72	1.0	0.030	0.000025	0.45	0.00070	0.0040	0.0000015	0.000040	0.00010	0.0035	-	0.00088	0.00034	0.000050	0.000045	0.000020	0.0000025	0.000040	0.0010
Median	7.84	1.0	0.030	0.000025	0.83	0.0012	0.0080	0.0000015	0.000040	0.00040	0.022	-	0.0018	0.00087	0.000050	0.000045	0.000050	0.0000025	0.000093	0.0010
90th, %ile	8.46	8.0	0.12	0.000025	1.0	0.0038	0.025	0.0000060	0.00035	0.0012	0.18	-	0.0055	0.0095	0.00090	0.00011	0.00022	0.0000025	0.00023	0.0030
Max	9.20	17	0.15	0.000025	1.2	0.0092	0.13	0.000020	0.00063	0.0037	0.44	-	0.021	0.040	0.0035	0.00077	0.00052	0.0000090	0.00089	0.041
Average	7.93	2.4	0.062	0.000025	0.78	0.0018	0.015	0.0000034	0.00012	0.00059	0.062	-	0.0028	0.0044	0.00039	0.000084	0.000091	0.0000026	0.00014	0.0021
St. Dev.	0.30	3.0	0.039	0	0.21	0.0018	0.022	0.0000038	0.00015	0.00064	0.10	-	0.0031	0.0093	0.00083	0.00013	0.00011	0.00000090	0.00017	0.0056
2. Conglomerate (CG), 42 samples																				
Min	7.61	1.0	0.030	0.000025	0.23	0.00030	0.0040	0.0000015	0.000040	0.00010	0.0035	-	0.00069	0.00015	0.000050	0.000045	0.000020	0.0000025	0.0000060	0.0010
10th, %ile	7.78	1.0	0.030	0.000025	0.70	0.00051	0.0060	0.0000015	0.000040	0.00010	0.0035	-	0.00095	0.00026	0.000050	0.000045	0.000020	0.0000025	0.000051	0.0010
Median	8.02	2.0	0.080	0.000025	0.84	0.0015	0.010	0.0000015	0.000095	0.00040	0.015	-	0.0018	0.00053	0.000050	0.000045	0.000060	0.0000025	0.00026	0.0010
90th, %ile	8.81	7.0	0.14	0.000025	1.2	0.0034	0.064	0.0000090	0.00043	0.00070	0.17	-	0.0034	0.0019	0.00080	0.000045	0.00017	0.0000025	0.00087	0.0019
Max	9.38	21	0.21	0.000025	1.4	0.0056	0.12	0.000046	0.00083	0.0011	0.41	-	0.0045	0.15	0.0029	0.00024	0.00079	0.000014	0.0018	0.0040
Average	8.18	3.4	0.09	0.000025	0.86	0.0018	0.021	0.0000055	0.00018	0.00041	0.059	-	0.0020	0.0044	0.00028	0.000052	0.000098	0.0000029	0.00039	0.0012
St. Dev.	0.43	4.0	0.049	0	0.22	0.0013	0.028	0.0000099	0.00019	0.00024	0.11	-	0.0010	0.022	0.00052	0.000033	0.00013	0.0000018	0.00043	0.00067
3. Mafic Dykes (MD), 22 samples																				
Min	7.68	1.0	0.030	0.000025	0.36	0.00010	0.0020	0.0000015	0.000040	0.00010	0.0035	-	0.00024	0.00031	0.000050	0.000045	0.000020	0.0000025	0.0000020	0.0010
10th, %ile	7.72	1.0	0.030	0.000025	0.45	0.00010	0.0031	0.0000015	0.000040	0.00010	0.0035	-	0.00076	0.00035	0.000050	0.000045	0.000020	0.0000025	0.0000030	0.0010
Median	7.88	1.0	0.030	0.000025	0.64	0.00075	0.0070	0.0000015	0.000040	0.00030	0.010	-	0.0015	0.0013	0.000050	0.000045	0.000020	0.0000025	0.000010	0.0010
90th, %ile	8.58	2.9	0.15	0.000025	0.85	0.0022	0.018	0.0000060	0.00034	0.00078	0.22	-	0.0039	0.0077	0.0025	0.000045	0.000070	0.0000025	0.000041	0.0010
Max	8.97	4.0	0.48	0.000025	0.95	0.0097	0.066	0.000012	0.00052	0.0016	0.26	-	0.0063	0.0095	0.0027	0.00011	0.00034	0.0000060	0.000049	0.0030
Average	7.97	1.5	0.10	0.000025	0.64	0.0015	0.013	0.0000028	0.00010	0.00037	0.056	-	0.0020	0.0026	0.00052	0.000048	0.000050	0.0000027	0.000018	0.0011
St. Dev.	0.35	0.84	0.12	0	0.17	0.0024	0.016	0.0000026	0.00014	0.00036	0.083	-	0.0014	0.0028	0.0010	0.000014	0.000069	0.00000073	0.000015	0.00046
4. Quartz-Tourmaline-Pyrite Veins in Lith (QTP), 14 samples																				
Min	7.65	1.0	0.030	0.000025	0.47	0.00060	0.0050	0.0000015	0.000040	0.00010	0.0090	-	0.00087	0.00022	0.000050	0.000045	0.000020	0.0000025	0.000042	0.0010
10th, %ile	7.73	1.0	0.030	0.000025	0.61	0.00060	0.0056	0.0000015	0.000040	0.00020	0.012	-	0.0010	0.00031	0.000050	0.000045	0.000029	0.0000025	0.000058	0.0010
Median	7.86	2.0	0.075	0.000025	0.84	0.0009	0.015	0.0000040	0.00011	0.00030	0.021	-	0.0014	0.00065	0.000050	0.000045	0.00012	0.0000025	0.00014	0.0010
90th, %ile	8.83	5.7	0.16	0.000025	1.1	0.0018	0.12	0.000046	0.00038	0.00054	0.096	-	0.0030	0.0053	0.00017	0.00023	0.00081	0.0000025	0.00017	0.0010
Max	9.33	7.0	0.21	0.000025	1.2	0.0028	0.24	0.000056	0.00066	0.00080	0.14	-	0.0050	0.0099	0.00020	0.00047	0.00083	0.0000025	0.00025	0.0010
Average	8.11	2.6	0.088	0.000025	0.86	0.0011	0.044	0.000012	0.00018	0.00032	0.037	-	0.0018	0.0019	0.000079	0.000094	0.00027	0.0000025	0.00013	0.0010
St. Dev.	0.50	2.0	0.057	0	0.21	0.00061	0.065	0.000018	0.00018	0.00018	0.040	-	0.0011	0.0028	0.000052	0.00012	0.00030	0	0.000050	0
5. Low-Grade Ore (LGO), 16 samples																				
Min	7.65	1.0	0.030	0.000025	0.20	0.00010	0.0050	0.0000015	0.000040	0.00010	0.0035	-	0.0014	0.00028	0.000050	0.000045	0.000020	0.0000025	0.000049	0.0010
10th, %ile	7.67	1.0	0.030	0.000025	0.52	0.00060	0.0075	0.0000015	0.000040	0.00010	0.0075	-	0.0018	0.00040	0.000050	0.000045	0.000035	0.0000025	0.000055	0.0010
Median	7.76	4.5	0.030	0.000025	0.90	0.0010	0.0180	0.0000035	0.000040	0.00025	0.017	-	0.0035	0.0013	0.00020	0.000045	0.00014	0.0000025	0.00012	0.0010
90th, %ile	7.91	18	0.090	0.000025	1.1	0.0052	0.038	0.0000100	0.000095	0.00065	0.071	-	0.0068	0.0074	0.00030	0.000045	0.00023	0.0000038	0.00038	0.0010
Max	8.00	77	0.11	0.00037	1.2	0.0058	0.084	0.0000140	0.00011	0.0010	0.099	-	0.0368	0.038	0.00040	0.00012	0.00028	0.0000060	0.00070	0.0030
Average	7.77	10	0.047	0.000047	0.86	0.0019	0.024	0.0000046	0.000057	0.00032	0.029	-	0.0057	0.0044	0.00016	0.000050	0.00014	0.0000029	0.00019	0.0011
St. Dev.	0.09	18	0.027	0.000084	0.24	0.0018	0.019	0.0000037	0.000026	0.00026	0.028	-	0.0082	0.0089	0.00011	0.000018	0.000077	0.0000010	0.00017	0
6. High-Grade Ore (ORE), 44 samples																				
Min	7.53	1.0	0.030	0.000025	0.087	0.00010	0.0080	0.0000015	0.000040	0.00010	0.0035	-	0.00053	0.00023	0.000050	0.000045	0.000020	0.0000025	0.0000080	0.0010
10th, %ile	7.67	1.0	0.030	0.000025	0.55	0.0005	0.010	0.0000015	0.000040	0.00010	0.0035	-	0.0012	0.00046	0.000050	0.000045	0.000026	0.0000025	0.000058	0.0010
Median	7.81	4.0	0.030	0.000025	0.77	0.0016	0.031	0.0000035	0.000065	0.00030	0.018	-	0.0030	0.0019	0.00005	0.000045	0.00014	0.0000025	0.00015	0.0010
90th, %ile	8.46	15	0.13	0.000025	1.0	0.0036	0.088	0.000021	0.00037	0.00064	0.17	-	0.0076	0.0093	0.00037	0.00040	0.00041	0.0000050	0.00030	0.0017
Max	9.38	85	0.17	0.000080	1.4	0.0046	0.15	0.00015	0.00064	0.00090	0.43	-	0.32	0.048	0.0025	0.0013	0.0013	0.000013	0.0014	0.0060
Average	8.00	7.9	0.061	0.000026	0.76	0.0017	0.041	0.000011	0.00016	0.00032	0.063	-	0.011	0.0041	0.00023	0.00017	0.00022	0.0000033	0.00018	0.0013
St. Dev.	0.44	13	0.044	0.0000082	0.23	0.0011	0.032	0.000024	0.00016	0.00022	0.10	-	0.047	0.0074	0.00049	0.00030	0.00024	0.0000021	0.00022	0.0011
7. Overburden (OB), 45 samples																				
Min	5.63	1.0	0.030	0.000025	0.0060	0.00060	0.0070	0.0000015	0.000040	0.00020	0.0035	-	0.0029	0.00013	0.000050	0.000045	0.000020	0.0000025	0.0000090	0.0010
10th, %ile	6.92	3.0	0.042	0.000025	0.030	0.0015	0.012	0.0000054	0.000040	0.00060	0.0080	-	0.012	0.00021	0.00034	0.000045	0.000044	0.0000025	0.000042	0.0010
Median	7.87	6.0	0.19	0.000025	0.19	0.0060	0.18	0.000017	0.00059	0.0025	0.20	-	0.048	0.0013	0.0011	0.00038	0.00014	0.0000025	0.00043	0.0020
90th, %ile	9.04	112	0.34	0.000025	1.3	0.013	0.50	0.00011	0.0028	0.011	1.8	-	0.41	0.0075	0.0080	0.0018	0.0025	0.000032	0.0026	0.0086
Max	9.56	280	0.53	0.00011	4.7	0.025	0.68	0.0045	0.0075	0.039	3.7	-	7.4	0.027	0.068	0.0047	0.0083	0.000080	0.0099	0.016
Average	7.85	36	0.20	0.000027	0.53	0.0068	0.23	0.00017	0.0011	0.0044	0.53	-	0.36	0.0030	0.0059	0.00080	0.00092	0.000012	0.0010	0.0035
St. Dev.	0.88	65	0.11	0.000013	0.82	0.0051	0.20	0.00068	0.0014	0.0067	0.80	-	1.2	0.0046	0.015	0.0011	0.0018	0.000018	0.0016	0.0037

Notes:

SFE is analyzed for waste rock, ore and overburden associated with the Berry Pit.

MDMER - Metal and Diamond Mining Effluent Regulations (Canada), Table 1 of Schedule 4, Maximum Authorized Monthly Mean Concentrations (SOR/2002-222 2020).

CWQG - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life, long-term (CWQG-FAL referred to as CWQG) by Canadian Council of Ministers of the Environment (CCME 2020).

For the details on guideline selection and calculations of hardness-, pH-, temperature-, and DOC-dependent CWQG guidelines (*) see Table B-9.

Concentrations exceeding CWQG are highlighted orange and MDMER are highlighted red and with red text. If the value exceeds both, it will have orange fill with red text.

Guidelines were not applied to the standard deviation values.

For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters.

Table B-7: Summary of TEC Statistics for Materials from Berry Deposit

	Ag	Al	As	B	Be	Cd	Co	Cr	Cu	Fe	Hg	Mn	Mo	Ni	P	Pb	Se	Tl	U	V	Zn
ACUCx10	530	407639	48	-	21	0.90	173	920	280	320415	0.5	774.5	11	470	654.3	170	0.9	9	27	970	670
Units	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g
1. Qtz-eye Porphyry (QE-POR), 108 samples																					
Min	0.50	3800	0.25	-	0.046	0.010	1.0	0.95	1.0	8900	0.025	120	0.050	0.21	-	0.21	0.35	0.010	0.046	1.0	3.8
10th, %ile	0.50	6640	0.25	-	0.058	0.010	2.7	1.4	1.8	18000	0.025	307	0.13	0.50	-	0.31	0.35	0.010	0.091	4.0	5.1
Median	0.50	9700	0.77	-	0.084	0.035	4.6	2.5	7.3	23000	0.025	530	0.52	0.81	-	0.62	0.35	0.010	0.13	13	6.8
90th, %ile	0.50	14000	2.4	-	0.13	0.26	8.3	89	31	32000	0.025	755	4.5	5.3	-	4.4	0.35	0.010	0.19	25	8.8
Max	0.50	22000	19	-	0.23	4.4	27	130	200	53000	0.025	2000	6.1	13	-	67	1.4	0.10	0.46	120	18
Average	0.50	10152	1.3	-	0.091	0.18	5.4	20	16	24906	0.025	548	1.3	2.1	-	2.8	0.37	0.011	0.14	15	7.0
St. Dev.	0	3338	2.0	-	0.032	0.58	3.7	36	25	7588	0	244	1.7	2.8	-	8.8	0.13	0.0086	0.060	18	2.0
2. Conglomerate (CG), 64 samples																					
Min	0.50	4000	0.25	-	0.085	0.010	2.6	3.6	0.3	17000	0.025	400	0.050	2.8	-	0.57	0.35	0.010	0.085	14	4.8
10th, %ile	0.50	6930	0.63	-	0.12	0.025	5.9	9.6	6.9	22000	0.025	586	0.050	5.6	-	0.88	0.35	0.010	0.30	20	7.5
Median	0.50	12000	1.1	-	0.19	0.064	11	49	20	28500	0.025	920	0.26	15	-	1.5	0.35	0.010	0.69	31	11.0
90th, %ile	0.50	19000	2.1	-	0.33	0.11	15	81	52	38700	0.025	1300	3.4	24	-	2.9	0.35	0.010	0.99	51	46
Max	0.50	35000	5.1	-	0.52	0.18	33	99	160	73000	0.025	2200	35	32	-	9.4	0.35	0.030	1.5	180	58
Average	0.50	12652	1.2	-	0.21	0.067	11	47	28	30281	0.025	949	1.5	14	-	1.8	0.35	0.011	0.64	38	20
St. Dev.	0	5782	0.78	-	0.093	0.037	5.4	27	26	10337	0	333	4.4	7.1	-	1.3	0	0.0035	0.27	30	15.8
3. Mafic Dykes (MD), 42 samples																					
Min	0.50	8900	0.25	-	0.065	0.010	4.2	1.3	2.0	21000	0.025	390	0.050	0.70	-	0.40	0.35	0.010	0.044	5.4	4.3
10th, %ile	0.50	13200	0.58	-	0.10	0.021	9.0	2.2	10	31000	0.025	682	0.050	3.5	-	0.54	0.35	0.010	0.080	29	6.5
Median	0.50	23000	1.7	-	0.20	0.094	24	56	38	55000	0.025	1150	0.49	15	-	1.1	0.35	0.010	0.13	125	11
90th, %ile	0.50	35800	20	-	0.34	0.30	38	100	67	78900	0.025	1600	2.4	29	-	3.8	0.35	0.010	0.22	210	21
Max	0.50	40000	92	-	0.50	1.0	46	140	83	110000	0.025	1800	4.6	40	-	36	0.35	0.058	0.28	290	27
Average	0.50	23769	8.1	-	0.21	0.14	24	50	39	57071	0.025	1144	0.82	16	-	2.5	0.35	0.011	0.14	125	12
St. Dev.	0	8236	16	-	0.11	0.16	11	40	22	19915	0	375	1.0	11	-	5.5	0	0.0075	0.054	72	5.6
4. Quartz-Tourmaline-Pyrite Veins in Lith (QTP), 19 samples																					
Min	0.50	3600	0.25	-	0.030	0.010	2.6	1.1	2.6	13000	0.025	170	0.10	0.48	-	0.23	0.35	0.010	0.061	4.0	4.5
10th, %ile	0.50	5080	0.25	-	0.048	0.018	3.1	1.4	4.7	18600	0.025	336	0.33	0.66	-	0.28	0.35	0.010	0.068	4.8	6.7
Median	0.50	8700	0.9	-	0.070	0.031	4.5	54	9	23000	0.025	560	0.60	1.3	-	0.69	0.35	0.010	0.13	10	10
90th, %ile	0.50	11200	1.7	-	0.11	0.1	7.3	70	71	29800	0.025	756	2.1	1.9	-	2.0	0.35	0.010	0.17	20	35
Max	0.50	13000	3.1	-	0.12	4.7	7.9	130	180	35000	0.060	910	7.6	3.7	-	18	0.35	0.010	0.19	22	48
Average	0.50	8426	1.0	-	0.074	0.28	5.0	39	27	23526	0.027	535	1.2	1.3	-	1.7	0.35	0.010	0.12	11	16
St. Dev.	0	2331	0.70	-	0.026	1.0	1.5	36	44	4967	0	176	1.6	0.72	-	4.0	0	0	0.037	5.7	12
5. Low-Grade Ore (LGO), 18 samples																					
Min	0.50	2000	0.25	-	0.030	0.010	1.9	1.0	2.2	10000	0.025	190	0.20	0.76	-	0.12	0.35	0.010	0.020	0.50	5.3
10th, %ile	0.50	3550	0.25	-	0.036	0.010	3.6	1.4	2.6	17100	0.025	301	0.37	0.84	-	0.40	0.35	0.010	0.047	2.5	5.8
Median	0.50	6150	1.1	-	0.065	0.032	5.2	64	12	22500	0.025	520	0.94	1.8	-	0.71	0.35	0.010	0.10	7.3	14
90th, %ile	0.50	9190	3.3	-	0.10	0.080	12	79	47	30000	0.025	702	1.4	2.2	-	3.6	0.35	0.010	0.12	13	25
Max	0.50	10000	8.7	-	0.12	0.23	60	93	410	100000	0.025	890	1.6	6.4	-	9.4	2.3	0.040	0.19	23	57
Average	0.50	6117	1.8	-	0.064	0.047	8.5	52	39	26667	0.025	513	0.90	1.9	-	1.6	0.46	0.012	0.10	8.1	17
St. Dev.	0	2212	2.0	-	0.024	0.050	12.8	30	92	18532	0	167	0.36	1.2	-	2.2	0	0.0069	0.038	5.4	12
6. High-Grade Ore (ORE), 52 samples																					
Min	0.50	1200	0.25	-	0.010	0.010	2.1	1.2	0.90	12000	0.025	79	0.050	0.36	-	0.30	0.35	0.010	0.036	0.50	1.7
10th, %ile	0.50	2760	0.60	-	0.031	0.010	2.8	1.7	3.7	16100	0.025	292	0.20	0.62	-	0.46	0.35	0.010	0.059	2.2	4.5
Median	0.50	7150	1.3	-	0.070	0.035	5.9	72	13	25000	0.025	480	0.86	1.6	-	1.8	0.35	0.010	0.10	7.2	9.9
90th, %ile	0.50	12000	3.5	-	0.12	0.13	10	107	39	35000	0.025	728	6.2	4.3	-	14	0.35	0.010	0.16	16	30
Max	2.0	33000	6.8	-	0.27	5.0	26	202	60	91000	0.15	1400	11	27	-	150	1.4	0.080	0.28	160	54
Average	0.54	7915	1.8	-	0.076	0.19	6.6	61	18	27192	0.027	510	1.9	3.0	-	7.5	0.39	0.012	0.11	13	15
St. Dev.	0.22	5266	1.3	-	0.047	0.75	4.2	48	15	13219	0.017	248	2.6	5.3	-	22	0.19	0.010	0.045	24	13
7. Overburden (OB), 45 samples																					
Min	0.50	15000	3.2	-	0.21	0.040	15	30	38	33000	0.025	470	0.30	22	-	4.5	0.35	0.050	0.52	55	53
10th, %ile	0.50	16400	18	-	0.24	0.094	17	35	41	37400	0.025	564	0.50	26	-	5.4	0.35	0.070	0.60	63	60
Median	0.50	19000	42	-	0.28	0.18	21	41	50	43000	0.025	1200	1.0	30	-	6.9	0.35	0.090	0.92	78	71
90th, %ile	0.50	23000	58	-	0.36	0.31	25	80	61	49000	0.025	1560	2.4	45	-	12	0.35	0.13	2.2	90	91
Max	2.0	27000	91	-	0.50	0.60	30	120	98	57000	0.025	2600	4.9	66	-	26	1.1	0.39	3.8	116	130
Average	0.53	19622	41	-	0.29	0.20	21	53	51	43178	0.025	1083	1.4	34	-	8.1	0.38	0.10	1.3	78	75
St. Dev.	0.22	2627	17	-	0.054	0.10	3.1	20	11	4630	0	430	0.96	8.4	-	3.5	0.13	0.051	0.81	12	16

Notes:

Respective samples from Phase I, II and III are combined.

ACUC - Average Concentration in the Upper Crust of the Earth based on Rudnick and Gao (2004); Values exceeding 10x the Average Concentration in the Upper Crust are highlighted in red with red text.

For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters.

Table B-8: ABA Analysis and rates for Composite Samples

Parameter	Units	B QPOR	B SED	B MD	B QTP	B LGO	B HGO	B QPOR-PAG	B SED-High SFE	B QTP-PAG	B LGO-PAG	B HGO-PAG-Zn	B OB-ML	B-QPOR_FB	B-CG_FB	B-MD_FB	B-QTP_FB	B-LGO_FB	B-HGO_FB	B QPOR-PAG-CO3DP	B QTP-PAG-CO3DP	B LGO-PAG-CO3DP	B HGO-PAG-CO3DP	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Paste pH	pH Units	9.46	9.21	8.88	9.45	9.02	9.48	9.20	9.07	9.24	8.39	9.29	7.46	9.45	9.35	9.07	9.40	9.43	9.34	9.11	9.14	8.23	8.99	9.00	9.23
Fizz Rate	no unit	2	3	3	2	2	2	2	2	2	2	2	2	4	4	4	3	3	4	2	2	2	2	3	3
Sample weight	g	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
HCl Added	mL	30	60	75	30	35	30	20	28	20	20	20	20	40	54	76	27	27	40	20	20	20	20	31	31
HCl	Normality	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH	Normality	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH to pH=8.3	mL	16	25	34	17	18	16	14	13	10	8	12	16	21	20	28	12	11	25	18	19	19	19	15	13
Final pH	no unit	1.55	1.59	1.63	1.42	1.43	1.52	1.32	1.62	1.56	1.77	1.40	1.44	1.46	1.63	1.64	1.58	1.59	1.26	1.13	1.18	1.21	1.18	1.76	1.89
S_{TOTAL}	wt.%	0.29	0.023	0.24	0.28	1.9	0.77	1.1	0.15	1.3	5.35	0.81	0.091	0.28	0.0090	0.13	0.27	0.57	0.67	1.3	1.1	4.4	0.77	0.51	0.21
$S_{SULPHATE}$	wt.%	0.040	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	0.12	0.050	*0.02*	0.24	0.070	0.080	0.05	*0.02*	*0.02*	0.040	0.090	0.070	*0.02*	*0.02*	*0.02*	0.060	0.080	*0.02*
$S_{SULPHIDE}$	wt.%	0.24	*0.02*	0.22	0.25	1.92	0.76	0.93	0.10	1.30	5.11	0.74	*0.02*	0.23	*0.02*	0.10	0.23	0.48	0.60	1.30	1.13	4.37	0.71	0.43	0.17
Carb. NP	kg $CaCO_3$/t	35	88	88	29	41	33	16	33	25	31	19	26	47	92	125	38	40	37	13	8	11	4	39	43
Modified Sobek NP	kg $CaCO_3$/t	36	86	100	31	43	35	15	36	26	31	20	10	46	87	124	38	39	38	4.0	2.9	3.1	2.8	38	43
Lab AP	kg $CaCO_3$/t	7.5	1.3	6.9	7.8	60	24	29	3.1	41	160	23	1.3	7.2	1.3	3.1	7.2	15	19	41	35	137	22	13	5.3
Lab NNP	kg $CaCO_3$/t	28	85	93	23	-17	12	-14	33	-15	-129	-3.5	8.7	39	86	120	31	24	20	-37	-32	-133	-19	25	38
Carbonate NNP	kg $CaCO_3$/t	27	86	81	22	-19	9.5	-13	29	-15	-129	-3.8	24	40	90	122	31	25	18	-28	-27	-126	-18	25	38
Lab NPR	unit less	4.8	69.0	14.5	4.0	**0.7**	**1.5**	**0.5**	11.5	**0.6**	**0.2**	**0.9**	7.9	6.4	69.8	39.6	5.3	2.6	2.1	**0.1**	**0.1**	**0.0**	**0.1**	2.9	8.1
Carbonate NPR	unit less	4.6	70.0	12.8	3.8	**0.7**	**1.4**	**0.6**	10.4	**0.6**	**0.2**	**0.8**	20.5	6.5	73.3	40.1	5.3	2.6	**2.0**	**0.3**	**0.2**	**0.1**	**0.2**	2.9	8.2
Carbon (total)	wt.%	0.41	1.1	1.1	0.35	0.50	0.40	0.19	0.39	0.30	0.38	0.23	0.31	0.56	1.1	1.5	0.45	0.48	0.45	0.15	0.10	0.13	0.045	0.47	0.52
Carbonate	wt.%	2.0	5.2	5.2	1.7	2.3	1.9	0.9	1.9	1.4	1.8	1.1	0.68	2.7	5.4	7.4	2.1	2.2	2.1	0.26	0.21	0.20	0.07	2.2	2.4
Max Sulphate Rate	mg/kg/week	5.2	3.6	6.6	4.9	10	12	15	6.2	21	44	11	92	-	-	-	-	-	-	11	6.2	22	4.6	-	387
Max NP Rate	mg $CaCO_3$/kg/week	14	22	19	12	11	12	15	21	16	8.6	14	8.0	-	-	-	-	-	-	1.0	1.0	1.0	1.0	-	59
Max NP Depletion Rate	mg $CaCO_3$/kg/week	16	25	25	17	21	25	0	24	37	53	23	104	-	-	-	-	-	-	9	5	15	3	-	473
Carb. NP Depletion Time (minimum)	year	42	67	67	34	38	26	-	26	13	11	16	5	-	-	-	-	-	-	27	32	14	25	-	1.8
AP Depletion Time (minimum)	year	9	1.1	6	10	36	12	12	3	12	22	13	0.04	-	-	-	-	-	-	23	35	38	30	-	0.08
Time to ARD Onset	year	33.9	53.4	21.0	27.2	30.5	20.8	11.0	20.8	10.5	9.2	12.9	3.8							22	26	11.1	20		0.04

Notes:

S_{TOTAL} = Total Sulphur; $S_{SULPHIDE}$ = Sulphide Sulphur; $S_{SULPHATE}$ = Sulphate Sulphur.

AP = Acid Potential

Carb. NP - Carbonate Neutralization Potential

NNP = Net Neutralization Potential

NPR =Neutralization Potential Ratio

NPR values between 1 and 2 are bolded and below 1 are bolded and shaded;

See text for assumptions and calculations.

1/2 of RDLs are used to calculate statistical parameters, these values are shown in blue italics.

Table B-9: SFE concentrations in composite samples

Parameter	Unit	MDMER	CWQG	B QPOR	B SED	B MD	B QTP	B LGO	B HGO	B QPOR-PAG	B SED-High SFE	B QTP-PAG	B LGO-PAG	B HGO-PAG-Zn	B OB-ML	B QPOR_FB	B CG_FB	B MD_FB	B QTP_FB	B LGO_FB	B HGO_FB
				Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT	Pre-HCT
Sample weight	g			250.00	250.00	251.00	251.00	249.00	249.00	100.00	100.00	100.00	100.00	100.00	100.00	250.00	250.00	250.00	250.00	250.00	251.00
Volume D.I. Water	mL			750.00	750.00	750.00	750.00	750.00	750.00	300.00	300.00	300.00	300.00	300.00	300.00	750.00	750.00	750.00	750.00	750.00	750.00
Final pH	no unit			9.38	9.27	8.99	9.37	8.91	9.26	8.72	9.08	9.04	8.49	8.99	7.51	9.02	9.16	8.90	9.08	9.20	8.98
pH	pH Unit	6.0-9.5	6.5-9.0	8.1	8.0	7.9	7.9	7.9	8.0	7.5	7.6	7.6	7.6	7.6	7.9	8.0	8.2	8.0	7.9	8.0	7.9
Conductivity	µS/cm	n/v	n/v	76	88	95	87	109	97	142	113	122	238	110	399	86	89	83	81	79	97
Alkalinity	mg/L as $CaCO_3$	n/v	n/v	29	35	38	33	34	31	35	38	31	39	35	86	35	40	40	29	31	31
F	mg/L	n/v	0.12	0.16	0.14	0.13	0.080	0.080	0.060	0.11	0.16	*0.03*	0.060	*0.03*	0.060	0.070	0.11	*0.03*	0.060	*0.03*	*0.03*
SO_4	mg/L	n/v	n/v	*2.5*	11	7.8	6.6	12	12	20	7.8	20	54	11	110	4.4	3.2	*1*	3.8	3.0	8.9
Hg	mg/L	n/v	0.000026	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*	-	-	-	-	-	-	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*
Ag	mg/L	n/v	0.00025	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	0.000080	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*	*0.000025*
Al	mg/L	n/v	0.1	1.2	0.88	0.55	0.93	0.75	0.89	0.43	0.45	0.66	0.39	0.62	0.070	1.0	0.93	0.76	1.2	1.3	0.97
As	mg/L	0.1	0.005	0.0033	0.0021	0.0010	0.0016	0.0016	0.0015	0.00080	0.00070	0.0011	0.00020	0.0012	0.0077	0.0047	0.0020	0.0018	0.0018	0.0027	0.0013
Ba	mg/L	n/v	n/v	0.00091	0.0199	0.0026	0.0010	0.0006	0.0008	0.0008	0.0039	0.0023	0.0017	0.0010	0.0434	0.0007	0.0038	0.0018	0.00074	0.00066	0.0011
B	mg/L	n/v	1.5	0.0050	0.019	0.013	0.048	0.029	0.027	0.018	0.026	0.033	0.017	0.020	0.0030	0.010	0.026	0.022	0.056	0.028	0.049
Be	mg/L	n/v	n/v	0.000039	*0.0000035*	0.000036	0.000040	0.000014	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*	*0.0000035*
Bi	mg/L	n/v	n/v	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*	0.000020	*0.000005*	*0.000005*	*0.000005*	*0.000005*	0.000080	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*	*0.000005*
Ca	mg/L	n/v	n/v	7.0	6.7	11	8.1	11	9.2	16	9.9	15	33	13	74	8.0	5.9	8.9	8.0	7.9	11
Cd*	mg/L	n/v	0.00004	0.000063	0.0000040	0.000067	0.000049	0.0000070	0.000010	0.000005	0.000018	*0.0000015*	*0.0000015*	*0.0000015*	0.0000750	*0.0000015*	*0.0000015*	*0.0000015*	*0.0000015*	*0.0000015*	*0.0000015*
Co	mg/L	n/v	n/v	0.000015	0.0000080	0.000020	0.000020	0.000011	0.000012	0.000024	0.000014	0.000030	0.000039	0.000020	0.000314	0.000022	0.000011	0.0000060	0.0000060	0.000018	0.000014
Cr	mg/L	n/v	0.0089	0.0002	*0.00004*	0.0002	0.0002	*0.00004*	0.000090	*0.00004*	0.000090	*0.00004*	*0.00004*	*0.00004*	0.00041	*0.00004*	*0.00004*	*0.00004*	*0.00004*	0.0009	*0.00004*
Cu*	mg/L	0.1	0.002	0.00060	0.00080	0.00070	0.0014	0.0011	0.0021	0.0014	0.00040	0.00050	0.00050	0.00030	0.0077	0.00030	0.00040	*0.00010*	0.00020	0.00070	0.00020
Fe	mg/L	n/v	0.3	*0.0035*	*0.0035*	*0.0035*	0.026	0.008	0.012	0.017	0.017	0.011	*0.0035*	0.018	0.077	*0.0035*	*0.0035*	*0.0035*	0.010	0.015	*0.0035*
K	mg/L	n/v	n/v	2.9	4.5	2.8	2.7	3.0	2.0	2.6	6.9	3.0	3.0	2.5	2.0	2.3	5.2	3.0	3.0	2.8	3.0
Li	mg/L	n/v	n/v	0.00050	0.00060	0.00030	0.00050	0.00060	0.00050	0.00060	0.00020	0.00020	0.00050	0.00020	0.00030	0.0011	0.00030	0.00020	0.00020	0.00060	0.00030
Mg	mg/L	n/v	n/v	0.45	0.95	1.4	0.75	0.74	0.63	1.3	1.3	0.98	1.9	0.95	4.4	0.81	0.96	1.67	0.65	0.61	0.90
Mn*	mg/L	n/v	0.19	0.0011	0.0014	0.0015	0.0020	0.0052	0.0023	0.025	0.0019	0.0040	0.0174	0.0043	0.35	0.0022	0.0015	0.0015	0.0016	0.0020	0.0024
Mo	mg/L	n/v	0.073	0.0019	0.0015	0.0030	0.0057	0.0054	0.0014	0.0092	0.068	0.0041	0.0039	0.0019	0.013	0.0011	0.00060	0.0011	0.0033	0.0017	0.0031
Na	mg/L	n/v	n/v	5.4	6.7	3.6	5.8	6.3	6.9	8.0	5.0	5.6	7.2	5.1	1.6	8.3	9.3	4.5	5.7	5.9	6.1
Ni*	mg/L	0.25	0.025	0.00010	*0.00005*	0.00010	0.00020	*0.00005*	0.00010	0.00060	0.00040	0.00050	0.00040	0.00040	0.0015	0.00050	0.00040	0.00020	0.00030	0.00070	0.00010
Pb*	mg/L	0.08	0.001	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*	*0.000045*
Sb	mg/L	n/v	n/v	0.0013	0.0023	0.0012	0.0013	0.0017	0.0024	*0.00045*	*0.00045*	*0.00045*	*0.00045*	0.0018	0.0031	*0.00045*	*0.00045*	*0.00045*	*0.00045*	*0.00045*	0.00090
Se	mg/L	n/v	0.001	0.0011	0.00024	0.0013	0.0012	0.00018	0.00021	0.00040	0.00008	0.00028	0.00032	0.00028	0.0036	0.00032	0.000050	0.00011	0.000060	0.00012	0.00014
Sn	mg/L	n/v	n/v	0.000030	*0.00003*	*0.00003*	0.000070	0.000060	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*	*0.00003*
Si	mg/L	n/v	n/v	2.4	2.1	1.4	2.5	2.2	2.6	2.2	2.2	2.2	1.7	2.2	2.4	2.0	1.9	1.0	1.8	2.1	1.6
Sr	mg/L	n/v	n/v	0.010	0.090	0.048	0.026	0.024	0.022	0.012	0.10	0.037	0.050	0.036	0.15	0.010	0.065	0.023	0.015	0.014	0.025
Ti	mg/L	n/v	n/v	0.00094	0.000070	0.0011	0.0017	0.00025	0.00064	0.00071	0.00085	0.00042	0.00027	0.00083	0.0036	0.00014	0.00015	0.00018	0.00020	0.00038	0.000070
Tl	mg/L	n/v	0.0008	0.0000070	*0.0000025*	0.0000060	0.0000080	*0.0000025*	*0.0000025*	*0.0000025*	*0.0000025*	*0.0000025*	*0.0000025*	*0.0000025*	0.000016	*0.0000025*	*0.0000025*	*0.0000025*	*0.0000025*	*0.0000025*	*0.0000025*
U	mg/L	n/v	0.015	0.00017	0.00015	0.000022	0.00026	0.00032	0.00017	0.00010	0.00022	0.00010	0.00010	0.00016	0.0067	0.00011	0.00027	0.000010	0.000075	0.00010	0.00010
V	mg/L	n/v	n/v	0.0022	0.0042	0.0032	0.0025	0.0013	0.0019	0.00022	0.0027	0.0011	0.00022	0.0010	0.0041	0.0023	0.0051	0.0017	0.0020	0.0020	0.0017
Zn*	mg/L	0.4	0.0017	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*	*0.0010*

See notes at the end of the table.

Notes:
HCT - Humidity Cell Testing.
The most stringent guideline was selected when two or more guidelines are established for the same parameter under the same jurisdiction (CCME, Government of Canada).
CWQG - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life, long-term (CWQG-FAL referred to as CWQG) by Canadian Council of Ministers of the Environment (CCME 2020).
MDMER - Metal and Diamond Mining Effluent Regulations (Canada), Table 1 of Schedule 4, Maximum Authorized Monthly Mean Concentrations (SOR/2002-222 2020).
*Equations were used to calculate hardness-, pH-, temperature-, and DOC-dependent CWQG guidelines as follows:

- Total cadmium CWQG-FAL: at hardness > 280 mg/L the guideline is 0.00037 mg/L, at hardness between 17 and 280 mg/L the guideline (in µg/L) is 10^(1.016*(log10(Hardness))-1.71), at hardness < 17 mg/L the guideline is 0.00004 mg/L. The most stringent guideline value is applied when the water hardness is < 17 mg/L.
- Total copper CWQG: When the water hardness is 0 to < 82 mg/L the CWQG is 0.002 mg/L, The most stringent guideline value is applied when the water hardness is < 82 mg/L. at hardness ≥82 to ≤180 mg/L the CWQG is calculated as CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}, at hardness >180 mg/L the CWQG is 0.004 mg/L, if the hardness was unknown the CWQG was 0.002 mg/L.
- Total lead CWQG: When the hardness is 0 to ≤ 60 mg/L the CWQG is 0.001 mg/L, at hardness >60 to ≤ 180 mg/L the CWQG is calculated as CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}, at hardness >180 mg/L the CWQG is 0.007 mg/L, if the hardness was unknown the CWQG was 0.001 mg/L. The most stringent long-term guideline value is applied when the water hardness is < 60 mg/L.
- Dissolved manganese CWQG-FAL (mg/L): pH- and hardness-dependent guideline calculated based on the CWQG and benchmark calculator in Appendix B or Table 5 of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese (Dissolved) 2019 (CCME 2019). The table is valid between hardness 10 and 670 mg/L and pH 5.5 and 9.0. The most stringent guideline value is applied using 10 mg/L hardness and 5.5 pH.
- Total nickel CWQG: When the water hardness is 0 to ≤ 60 mg/L the CWQG is 0.025 mg/L, at hardness > 60 to ≤ 180 mg/L the CWQG is calculated as CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}. at hardness >180 mg/L, the CWQG is 150 µg/L. If the hardness is unknown, the CWQG is 25 µg/L. The most stringent long-term guideline value is applied when the water hardness is < 60 mg/L.
- Dissolved zinc CWQG-FAL: pH-, hardness-, and DOC-dependent guideline calculated as exp(0.947[ln(Hardness)] - 0.815[pH] + 0.398[ln(DOC)] + 4.625). The equation is valid between hardness 23.4 and 399 mg/L hardness, pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg/L. The most stringent guideline value is applied using 23.4 mg/L hardness, 8.13 pH, and 0.3 mg/L DOC, the values for which the equation is valid, and which generate the most stringent guideline. The Zn concentrations in this table are below the detection limit (0.002), which exceeds the guideline.

Hardness is the calcium and magnesium hardness calculated as the concentration of calcium and magnesium ions expressed as equivalent of calcium carbonate.
CWQG for total phosphorus: Canadian Guidance Frameworks is used for total phosphorus (CCME 2014): ultra-oligotrophic <4 µg/L, oligotrophic 4-10 µg/L, mesotrophic 10-20 µg/L, meso-eutrophic 20-35 µg/L, eutrophic 35-100 µg/L, hyper-eutrophic >100 µg/L.
Ammonia CWQG: pH and temperature-dependent guideline for total ammonia presented in Table 2 of the CWQG guidelines for the protection of aquatic life: Ammonia (CCME 2010).
The values from Table 2 are multiplied by 0.8224 to convert them into total ammonia (as N).
Nitrate and Nitrite Nitrogen: CWQG for nitrate is applied.
Aluminum CWQG: 0.1 mg/L if pH>6.5, otherwise 0.005 mg/L.
n/v - no value, guideline is not established.
Concentrations exceeding CWQG are highlighted orange and MDMER are highlighted red and with red text. If the value exceeds both, it will have orange fill with red text.

Table B-10: Total concentrations of trace elements in composite samples

Analysis	Unit	ACUCx10	B QPOR	B SED	B MD	B QTP	B LGO	B HGO	B QPOR-PAG	B SED-High SFE	B QTP-PAG	B LGO-PAG	B HGO-PAG-Zn	B OB-ML	B-QPOR_FB	B-CG_FB	B-MD_FB	B-QTP_FB	B-LGO_FB	B-HGO_FB	B QPOR-PAG-CO3DP	B QTP-PAG-CO3DP	B LGO-PAG-CO3DP	B HGO-PAG-CO3DP	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Hg	µg/g	0.5	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*	*0.025*
Ag	µg/g	530	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
As	µg/g	48	0.97	0.93	4.6	1.1	2.7	1.1	1.4	2.4	2.7	6.2	1.5	22	0.81	1.4	20	1.1	1.2	1.7	1.6	0.98	4.8	1.1	2.4	8.3
Al	µg/g	407639	7400	10000	26000	6100	6600	6900	6300	16000	5200	6400	6900	16000	12000	12000	24000	9800	8000	7900	5100	5600	6800	6100	9600	9800
Ba	µg/g		22	83	18	9.8	15	10	18	39	17	22	11	64	14	41	15	12	11	9.3	16	18	18	9.8	32	27
Be	µg/g	21	0.14	0.31	0.32	0.12	0.10	0.090	0.11	0.28	0.080	0.090	0.070	0.29	0.074	0.20	0.18	0.054	0.048	0.058	0.051	0.069	0.062	0.044	0.12	0.12
Bi	µg/g		0.2	0.1	< 0.09	0.16	0.65	1.2	0.29	< 0.09	0.37	1.1	6.3	0.17	< 0.09	0.093	< 0.09	0.11	0.45	1.2	0.1	0.13	0.36	3.7	2	1.2
Ca	µg/g		8600	19000	24000	7500	15000	12000	6300	14000	10000	12000	7400	5400	15000	27000	38000	13000	13000	13000	960	690	940	650	15000	16000
Cd	µg/g	0.90	0.19	0.10	0.11	0.075	0.040	0.030	0.030	0.040	0.030	*0.01*	0.040	0.16	0.050	0.065	0.10	0.21	0.044	0.12	0.030	*0.01*	*0.01*	*0.01*	0.19	0.23
Co	µg/g	173	3.5	8.2	22	4.2	21	4.8	4.1	10	18	28	6.8	16	7.4	9.9	20	3.8	5.4	4.3	13	3.9	26	6.1	6.0	4.4
Cr	µg/g	920	3.5	13	58	6.2	4.7	7.1	95	69	130	90	150	73	56	45	62	76	56	82	2.6	1.9	2.2	2.6	270	210
Cu	µg/g	280	18	42	38	26	26	26	15	25	13	92	13	45	26	16	31	16	73	15	13	8.5	150	8.3	51	650
Fe	µg/g	320415	17000	21000	48000	15000	31000	25000	24000	31000	25000	64000	24000	39000	26000	29000	52000	23000	24000	22000	27000	24000	61000	23000	26000	27000
K	µg/g		490	740	350	280	590	320	560	990	550	650	470	1600	420	630	390	400	400	310	500	510	570	380	1000	950
Li	µg/g		2.7	5.6	8	2.6	2.2	2.5	2	9	2	2	< 2	15	3.5	5	5.2	2.1	< 2	< 2	< 2	< 2	< 2	< 2	2.7	3
Mg	µg/g		2200	7200	17000	2100	2600	2800	2300	12000	2200	2500	2700	11000	5300	9600	16000	3200	2900	3000	2000	1800	2400	2200	3400	3600
Mn	µg/g	774.5	380	810	900	370	560	410	320	730	300	320	290	600	480	780	1000	460	440	430	110	110	150	130	490	500
Mo	µg/g	11	1.8	1.9	1.3	1.6	3.8	5.7	1.2	1.3	4.4	1.6	2.5	1.3	0.62	0.31	0.56	0.78	0.92	1.9	2.9	0.70	0.60	1.8	5.7	4.2
Ni	µg/g	470	1.3	13	20	2.2	2.6	2.8	5.7	21	6.3	5.0	6.5	29	22	16	15	2.6	4.2	3.8	0.82	1.0	2.9	1.2	71	35
Pb	µg/g	170	1.3	1.8	5.0	0.85	5.8	1.7	0.80	2.8	0.76	1.3	5.5	8.2	0.94	2.0	1.3	1.6	15	3.8	1.6	2.2	1.2	4.3	6.9	5.7
Sb	µg/g		< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Se	µg/g	0.9	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	0.80	1.1	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	*0.35*	0.8	*0.35*	*0.35*	*0.35*
Tin	µg/g		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	0.7	0.7
Sr	µg/g		8.3	36	42	10	14	12	7.3	23	11	12	8.5	17	15	38	46	12	13	14	4.1	4.5	6.1	3.4	17	19
Tin	µg/g		28	33	250	27	29	48	49	87	50	29	82	1500	110	320	370	79	43	39	22	39	17	43	160	110
Tl	µg/g	9	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	0.046	0.024	*0.01*	*0.01*	*0.01*
U	µg/g	27	0.14	0.62	0.16	0.11	0.10	0.10	0.13	0.58	0.10	0.12	0.090	1.6	0.13	0.79	0.12	0.12	0.10	0.10	0.084	0.10	0.079	0.071	0.15	0.14
V	µg/g	970	7.1	26	100	8.4	7.7	9.6	3.0	26	5.0	8.0	7.0	63	20	37	100	9.8	9.3	9.8	6.6	3.2	10	7.0	9.8	10
Y	µg/g		6.4	8	12	5.5	6.5	6.1	5.5	9.6	5	6.4	4.3	9.3	6.1	9.7	11	6.9	5.7	5.9	3.7	3.8	4.1	3	6.5	6
Zn	µg/g	670	26	39	75	24	25	26	17	50	13	17	18	62	44	58	85	49	31	34	14	15	20	18	40	38

Notes:

ACUC - Average Concentration in the Upper Crust of the Earth based on Rudnick and Gao (2004);

Values exceeding 10x the Average Concentration in the Upper Crust are highlighted red with red text.

For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters. It is displayed with blue italic text.

Table B-11: Summary of leachate chemistries from HC in waste rock, low-grade ore, and high-grade ore from Berry deposit.

Material	Parameter	pH	Alkalinity	SO_4	F	Hg	Ag	Al	As	B	Cd*	Cr	Cu*	Fe	Mn*	Mo	Ni*	Pb*	Se	Tl	U	Zn*
	Unit	pH Unit	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	MDMER	6.0-9.5	n/v	n/v	n/v	n/v	n/v	n/v	0.1	n/v	n/v	n/v	0.1	n/v	n/v	n/v	0.25	0.08	n/v	n/v	n/v	0.4
	CWQG	6.5-9.0	n/v	n/v	0.12	0.000026	0.00025	0.1	0.005	1.5	0.00004	0.0089	0.002	0.3	0.19	0.073	0.025	0.001	0.001	0.0008	0.015	0.0017
	10x CWQG	n/v	n/v	n/v	1.2	0.00026	0.0025	1	0.05	15	0.0004	0.089	0.02	3	1.9	0.73	0.25	0.01	0.01	0.008	0.15	0.017
Overburden	**B OB-ML**																					
	Max (Min for pH)	6.61	8.0	92	0.030	0.00002	0.000025	0.24	0.0046	0.029	0.000364	0.0018	0.014	0.20	0.58	0.0087	0.0031	0.00049	0.0022	0.000013	0.0105	0.016
	Average First Month	6.97	6.0	80	0.030	0.000005	0.000025	0.057	0.0020	0.0037	0.000058	9.3E-05	0.0033	0.042	0.084	0.0025	0.0005667	4.5E-05	0.0016	0.000004	0.00073	0.0010
	Average Last Month	7.01	6.7	10	0.030	0.000005	0.000025	0.095	0.0019	0.0020	1.167E-05	0.0003567	0.0029	0.092	0.010	0.00433	0.00053	0.00012	0.00031	0.000004	0.0017	0.0010
Waste Rock	**B QPOR**																					
	Max (Min for pH)	7.00	21	6.2	0.12	0.000005	0.000025	0.21	0.0021	0.024	0.000026	0.00060	0.0028	0.52	0.034	0.0046	0.0016	4.5E-05	0.00019	0.000043	0.0065	0.0020
	Average First Month	8.03	13	3.3	0.060	0.000005	0.000025	0.060	0.0011	0.0077	1.333E-05	0.000040	0.0016	0.0035	0.022	0.0034	0.00015	4.5E-05	0.00012	0.000003	0.0028	0.0010
	Average Last Month	7.51	7.7	0.67	0.030	0.000005	0.000025	0.045	0.00040	0.0010	0.000017	0.000065	0.00015	0.0035	0.032	0.00053	0.000825	4.5E-05	2.0E-05	0.000003	0.00037	0.0010
	B QPOR-PAG																					
	Max (Min for pH)	7.02	24	33	0.030	0.000005	0.000025	0.089	0.0029	0.019	0.000069	0.00051	0.0031	0.0080	0.082	0.0083	0.0020	4.5E-05	0.00083	0.000007	0.0047	0.0040
	Average First Month	7.65	15	17	0.030	0.000005	0.000025	0.050	0.0012	0.012	8.0E-06	0.0001533	0.0011	0.0050	0.067	0.0060	0.0005667	4.5E-05	0.00029	0.000003	0.0010	0.0010
	Average Last Month	7.22	7.7	2.6	0.030	0.000005	0.000025	0.025	0.00010	0.0020	0.0000045	0.00020	0.00023	0.0035	0.015	0.00075	0.00010	4.5E-05	0.000093	0.000003	0.000077	0.0010
	B QPOR-PAG-CO3DP																					
	Max (Min for pH)	4.73	1.0	7.3	0.030	0.000005	0.000025	0.0300	0.00270	0.0010	0.000087	0.0020	0.0299	0.78	0.40	0.00050	0.014	0.00013	0.00076	0.000011	0.00137	0.039
	Average First Month	5.23	1.0	4.9	0.030	0.000005	0.000025	0.0035	0.00010	0.0010	0.0000255	0.0011	0.0045	0.40	0.076	0.00026	0.0048	8.8E-05	0.000405	6.75E-06	0.00014	0.016
	Average Last Month	5.05	1.0	5.7	0.030	0.000005	0.000025	0.0055	0.00010	0.0010	0.000016	0.000040	0.0054	0.033	0.11	0.00026	0.0037	4.5E-05	0.000050	0.000003	1.7E-05	0.010
	B SED																					
	Max (Min for pH)	7.32	31	4.1	0.090	0.000005	0.000025	0.33	0.0037	0.015	6.0E-06	0.00034	0.0020	0.10	0.036	0.0053	0.0015	4.5E-05	0.00041	0.000028	0.012	0.0030
	Average First Month	8.42	21	2.4	0.030	0.000005	0.000025	0.11	0.0016	0.0067	0.0000015	0.000040	0.0010	0.0035	0.016	0.0016	0.0001833	4.5E-05	6.333E-05	0.000003	0.0015	0.0010
	Average Last Month	8.04	11	0.47	0.030	0.000005	0.000025	0.0445	0.00055	0.0010	0.0000045	0.000095	0.00020	0.0035	0.034	0.00060	0.000775	4.5E-05	0.000050	0.000003	0.00080	0.0010
	B SED-High SFE																					
	Max (Min for pH)	7.31	30	8.8	0.030	0.000005	0.000025	0.12	0.0019	0.017	0.000090	0.00052	0.00080	0.012	0.045	0.11	0.00070	0.00010	0.0010	0.000018	0.018	0.0010
	Average First Month	7.95	23	6.1	0.030	0.000005	0.000025	0.067	0.00043	0.012	0.000025	0.000080	0.00037	0.0050	0.028	0.075	0.0004333	6.3E-05	9.667E-05	1.233E-05	0.015	0.0010
	Average Last Month	7.57	11	0.83	0.030	0.000005	0.000025	0.042	0.00047	0.0010	7.0E-06	0.0002467	0.00010	0.0035	0.026	0.0058	0.00010	4.5E-05	3.333E-05	3.667E-06	0.0028	0.0010
	B MD																					
	Max (Min for pH)	7.18	25	7.2	0.030	0.000005	0.000025	0.20	0.00190	0.011	6.0E-06	0.00040	0.0018	0.11	0.021	0.0031	0.0016	4.5E-05	0.00017	0.000003	0.0021	0.0020
	Average First Month	8.15	18	4.4	0.030	0.000005	0.000025	0.079	0.00050	0.0080	2.333E-06	6.667E-05	0.00077	0.0077	0.013	0.0025	0.0002167	4.5E-05	0.0001133	0.000003	0.0014	0.0010
	Average Last Month	7.50	11	0.87	0.030	0.000005	0.000025	0.045	0.00050	0.0015	3.25E-06	0.000090	0.00010	0.0073	0.021	0.0017	0.00083	4.5E-05	0.000045	0.000003	0.00086	0.0010
	B QTP																					
	Max (Min for pH)	7.01	28	5.6	0.030	0.000005	0.000025	0.28	0.00080	0.021	5.0E-06	0.00045	0.0050	0.030	0.037	0.0094	0.0016	4.5E-05	0.00048	0.000008	0.0046	0.0020
	Average First Month	8.00	14	2.9	0.030	0.000005	0.000025	0.061	0.00047	0.017	3.667E-06	6.333E-05	0.0029	0.0088	0.028	0.0056	0.0002333	4.5E-05	9.333E-05	4.333E-06	0.0022	0.0010
	Average Last Month	7.36	10	0.63	0.030	0.000005	0.000025	0.038	0.00010	0.0015	2.25E-06	0.000040	0.00035	0.0035	0.037	0.0025	0.00083	4.5E-05	0.000045	0.000003	0.00022	0.0010
	B QTP-PAG																					
	Max (Min for pH)	6.93	23	31	0.030	0.000005	0.000025	0.057	0.00230	0.024	0.000080	0.00048	0.0011	0.014	0.064	0.0066	0.0023	4.5E-05	0.00094	0.000016	0.0037	0.0020
	Average First Month	7.75	19	18	0.030	0.000005	0.000025	0.038	0.00040	0.015	4.8E-06	9.667E-05	0.00050	0.0035	0.049	0.0042	0.0011	4.5E-05	0.0001433	0.000003	0.00061	0.0010
	Average Last Month	7.20	6.7	2.8	0.030	0.000005	0.000025	0.016	0.00093	0.006333	4.2E-06	0.0002067	0.00027	0.0035	0.021	0.0013	0.00010	4.5E-05	5.333E-05	0.000007	0.0014	0.0010
	B QTP-PAG-CO3DP																					
	Max (Min for pH)	4.73	1.0	7.3	0.030	0.000005	0.000025	0.0300	0.00270	0.0010	0.000087	0.0020	0.0299	0.78	0.40	0.00050	0.014	0.00013	0.00076	0.000011	0.00137	0.039
	Average First Month	5.23	1.0	4.9	0.030	0.000005	0.000025	0.0035	0.00010	0.0010	2.6E-05	0.0011	0.0045	0.40	0.076	0.00026	0.0048	8.8E-05	0.000405	6.75E-06	0.00014	0.016
	Average Last Month	5.05	1.0	5.65	0.030	0.000005	0.000025	0.0055	0.00010	0.0010	0.000016	0.000040	0.0054	0.033	0.11	0.00026	0.0037	4.5E-05	0.000050	0.000003	1.7E-05	0.010
Low-Grade Ore	**B LGO**																					
	Max (Min for pH)	6.97	23	11	0.030	0.000005	0.000025	0.17	0.0030	0.018	5.0E-06	0.00047	0.0076	0.011	0.036	0.0023	0.0015	4.5E-05	0.00074	0.000003	0.0018	0.0020
	Average First Month	7.89	12	5.4	0.030	0.000005	0.000025	0.053	0.00027	0.0090	2.0E-06	0.000040	0.0042	0.0065	0.028	0.0011	0.00030	4.5E-05	6.333E-05	0.000003	0.00065	0.0010
	Average Last Month	7.20	8.0	1.2	0.030	0.000005	0.000025	0.031	0.00010	0.003	2.3E-06	0.000040	0.00025	0.00575	0.031	0.00040	0.00078	4.5E-05	0.00038	0.000003	0.00076	0.0010
	B LGO-PAG																					
	Max (Min for pH)	6.91	14	86	0.030	0.000005	0.000025	0.062	0.00050	0.010	0.000078	0.00052	0.0017	0.018	0.061	0.0033	0.0011	0.00012	0.0010	0.000030	0.018	0.0010
	Average First Month	7.61	11	37	0.030	0.000005	0.000025	0.048	0.00010	0.0063	5.3E-06	7.667E-05	0.00057	0.0035	0.036	0.0021	0.0004333	4.5E-05	0.0002133	0.000003	0.0055	0.0010
	Average Last Month	7.30	10	9.5	0.030	0.000005	0.000025	0.019667	0.00023	0.004	5.3E-06	0.0001333	0.00037	0.0035	0.033	0.0016	0.00010	4.5E-05	4.333E-05	0.000008	0.0017	0.0010
	B LGO-PAG-CO3DP																					
	Max (Min for pH)	4.12	1.0	31	0.070	0.000005	0.000025	1.27	0.00080	0.0010	0.000070	0.0017	0.21	2.37	0.077	0.0028	0.0073	4.5E-05	0.00070	0.000019	0.00113	0.028
	Average First Month	4.88	1.0	19	0.030	0.000005	0.000025	0.036	0.00045	0.0010	0.0000405	0.000925	0.034	0.49	0.047	0.00024	0.0053	4.5E-05	0.000375	1.075E-05	0.00015	0.020
	Average Last Month	4.42	1.0	13	0.050	0.000005	0.000025	0.15	0.00025	0.0010	1.0E-05	0.000040	0.077	0.45	0.041	0.0014	0.0036	4.5E-05	0.00011	0.000003	0.00040	0.011
High-Grade Ore	**B HGO**																					
	Max (Min for pH)	6.97	25	14	0.11	0.000005	0.000025	0.20	0.00050	0.016	9.0E-06	0.00053	0.0033	0.17	0.039	0.0075	0.0016	0.00010	0.00043	0.000053	0.0054	0.0100
	Average First Month	7.88	13	7.8	0.030	0.000005	0.000025	0.042	0.00037	0.011	4.0E-06	0.000040	0.0016	0.0072	0.035	0.0046	0.0002667	6.3E-05	8.667E-05	3.333E-06	0.0022	0.0010
	Average Last Month	7.36	7.3	1.1	0.030	0.000005	0.000025	0.031	0.0001	0.0020	2.75E-06	0.000080	0.00025	0.0035	0.031	0.00080	0.000825	4.5E-05	0.00020	0.000014	0.0018	0.0010
	B HGO-PAG																					
	Max (Min for pH)	6.84	20	16	0.030	0.000005	0.000025	0.048	0.00070	0.017	0.000069	0.0016	0.0015	0.055	0.058	0.0043	0.00080	4.5E-05	0.00096	0.000025	0.0061	0.0030
	Average First Month	7.65	16	9.9	0.030	0.000005	0.000025	0.035	0.00047	0.011	4.833E-06	0.0001067	0.00030	0.0035	0.048	0.0018	0.0004333	4.5E-05	0.00012	0.000006	0.0017	0.0010
	Average Last Month	7.19	6	1.4	0.030	0.000005	0.000025	0.018	0.00033	0.0020	3.0E-06	0.0001933	0.00017	0.0035	0.022	0.0011	0.000050	4.5E-05	0.00024	0.000003	0.00012	0.0010
	B HGO-PAG-CO3DP																					
	Max (Min for pH)	4.62	1.0	9.8	0.030	0.000005	0.000025	0.0180	0.00040	0.0050	0.000051	0.0023	0.0202	0.44	0.071	0.00055	0.0127	4.5E-05	0.00060	0.000018	0.000089	0.02
	Average First Month	5.48	1.0	3.4	0.030	0.000005	0.000025	0.0035	0.00010	0.0035	0.000020	0.0012	0.0024	0.23	0.012	0.00031	0.0017	4.5E-05	0.00031	1.025E-05	0.0000585	0.016
	Average Last Month	5.11	1.0	3.7	0.030	0.000005	0.000025	0.0025	0.00010	0.0015	3.8E-06	0.000040	0.0028	0.014	0.011	0.00019	0.00075	4.5E-05	0.000050	0.000003	0.000035	0.014

Notes:

MDMER - Metal and Diamond Mining Effluent Regulations (Canada), Table 1 of Schedule 4, Maximum Authorized Monthly Mean Concentrations (SOR/2002-222 2020).

CWQG - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life, long-term (CWQG-FAL referred to as CWQG) by Canadian Council of Ministers of the Environment (CCME 2020).

For the details on guideline selection and calculations of hardness-, pH-, temperature-, and DOC-dependent CWQG guidelines (*) see Table B-9.

Concentrations exceeding CWQG are highlighted orange and MDMER are highlighted red and with red text. Values exceeding 10x CWQG are highlighted in yellow with yellow text.

For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters.

Table B-12: Summary of Ageing and Subaqueous testing for Berry tailings.

Test	Parameter	pH	F	NO_2	NO_3	NO_2+NO_3	Cl	SO_4	$CN_{(T)}$	CN_{WAD}	NH_3+NH_4	Un-ionized NH_3 (calc'd)	Hg	Ag	Al	As	B	Cd *	Cr	Cu*	Fe	Mn	Mo	Ni*	P	Pb*	Se	Tl	U	Zn*
	Unit	no unit	mg/L	as N mg/L	as N mg/L	as N mg/L	mg/L	mg/L	mg/L	mg/L	as N mg/L	as N mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	MDMER	6.0-9.5	n/v	n/v	n/v	n/v	n/v	n/v	0.5	n/v	n/v	0.5	n/v	n/v	n/v	0.1	n/v	n/v	n/v	0.1	n/v	n/v	n/v	0.25	n/v	0.08	n/v	n/v	n/v	0.4
	CWQG	6.5-9.0	0.12	0.06	13	n/v	120	n/v	n/v	0.005	0.410	0.016	0.000026	0.00025	0.1	0.005	1.5	0.00004	0.0089	0.002	0.3	0.19	0.073	0.025	0.004	0.001	0.001	0.0008	0.015	0.0017
	10x CWQG	n/v	1.2	0.6	130	n/v	1200	n/v	n/v	0.05	4.10	0.16	0.00026	0.0025	1	0.05	15	0.0004	0.089	0.02	3	1.9	0.73	0.25	0.04	0.01	0.01	0.008	0.15	0.017
		pH	F	NO_2	NO_3	NO_2+NO_3	Cl	SO_4	$CN_{(T)}$	CN_{WAD}	NH_3+NH_4	NH_3 (calc'd)	Hg (diss)	Ag (diss)	Al (diss)	As (diss)	B (diss)	Cd (diss)*	Cr (diss)	Cu (diss)*	Fe (diss)	Mn (diss)	Mo (diss)	Ni (diss)*	P (diss)	Pb (diss)*	Se (diss)	Tl (diss)	U (diss)	Zn (diss)*
		no unit	mg/L	as N mg/L	as N mg/L	as N mg/L	mg/L	mg/L	mg/L	mg/L	as N mg/L	as N mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Ageing (BL1021-43 Detox)	2022-NOV24 **Day 0**	8.02	0.080	*0.15*	*0.3*	*0.3*	7.8	780	**60**	0.48	2.8	0.11	0.000030	*2.5E-05*	0.022	0.00040	0.033	0.000028	*0.00004*	**0.41**	23	0.065	0.030	0.0028	0.0080	*0.000045*	0.00034	*0.0000025*	0.0013	*0.001*
	2022-DEC2 **Day 7**	7.86	0.070	*0.15*	*0.3*	*0.3*	10	770	**63**	7.9	1.9	0.05	0.00044	0.00062	0.013	0.00020	0.034	0.0000080	*0.00004*	**0.91**	18	0.050	0.0058	0.0094	0.0070	*0.000045*	0.00065	*0.0000025*	0.00099	*0.001*
	2022-DEC8 **Day 14**	7.89	0.070	*0.15*	*0.3*	*0.3*	7.5	840	**73**	9.4	1.9	0.057	0.000030	0.000070	0.012	0.00030	0.088	0.0000060	0.00011	**0.33**	7.6	0.043	0.0029	0.0092	0.0070	*0.000045*	0.00041	*0.0000025*	0.00047	*0.001*
	2022-DEC22 **Day 28**	7.88	0.15	*0.15*	*0.3*	*0.3*	7.6	940	**13**	11	3.9	0.11	0.000020	0.00037	0.017	0.00030	0.044	0.000026	*0.00004*	**6.9**	0.22	0.032	0.039	0.18	0.0040	*0.000045*	0.00047	0.0000080	0.00034	*0.001*
	2023-JAN19 **Day 56**	7.56	0.12	*0.15*	*0.3*	*0.3*	8.1	970	0.10	0.020	10	0.14	0.00029	*2.5E-05*	0.023	0.00060	0.039	0.000023	0.0035	0.027	0.15	0.030	0.042	0.023	0.0080	0.00016	0.0010	*0.0000025*	0.00028	0.0020
Sub-Aqueous (BL1021-43 Detox)	Max (Min for pH)	7.72	0.15	*0.015*	0.95	0.95	12	910	**31**	2.3	7.3	0.28	0.00028	0.0023	0.035	0.012	0.097	0.00053	0.015	**2.7**	13	0.23	0.066	0.012	0.12	0.0010	0.011	0.000019	0.00087	0.028
	Average First Month	7.91	0.083	*0.015*	*0.03*	*0.03*	8.3	823	**2.4**	2.0	6.8	0.22	0.000092	0.0012	0.023	0.00050	0.064	0.000026	0.000080	**2.3**	0.014	0.078	0.037	0.0024	0.0057	0.0000050	0.00042	0.000011	0.00050	0.012
	Average Last Month	7.79	0.13	*0.015*	*0.03*	*0.03*	7.2	735	**20**	0.14	0.40	0.011	0.000028	0.000025	0.022	0.0065	0.044	0.00027	0.0015	0.042	9.8	0.19	0.054	0.0037	0.085	0.00013	0.0057	0.0000025	0.00015	0.015

Notes:

MDMER - Metal and Diamond Mining Effluent Regulations (Canada), Table 1 of Schedule 4, Maximum Authorized Monthly Mean Concentrations (SOR/2002-222 2020).

CWQG - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life, long-term (CWQG-FAL referred to as CWQG) by Canadian Council of Ministers of the Environment (CCME 2020).

Concentrations exceeding MDMER are highlighted red and with red text, concntrations exceeding CWQG are highlighted orange, and concentrations exceeding 10x CWQG are highlighted in yellow with yellow text.

For the details on guideline selection and calculations of hardness-, pH-, temperature-, and DOC-dependent CWQG guidelines (*) see Table B-9.

Total ammonia as Nitrogen: guideline is pH- and temperature-dependent and is taken from the Environmental Quality Guidelines for Alberta Surface Water (Government of Alberta 2018), which is similar to CCME (2010), but is calculated for smaller temperature (1 Deg. C) and pH (0.1 pH unit) intervals.

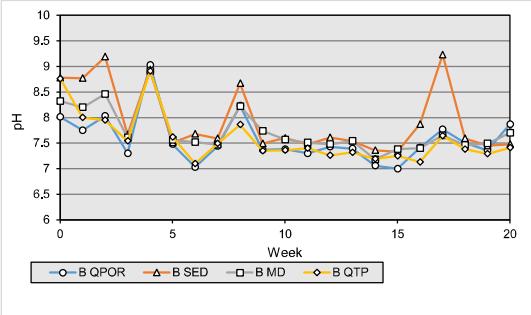
CN_{FREE} CWQG guideline is applied to CN_{WAD}.

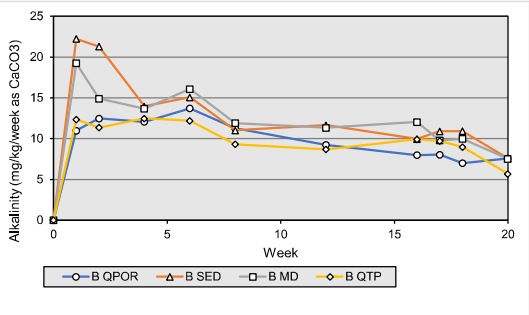
For the values less than Reportable Detection Limit (RDLs) values, 1/2 of RDLs are used to calculate statistical parameters. They are shown in blue italics text.

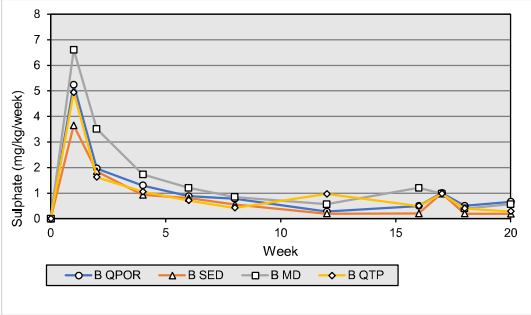
APPENDIX C

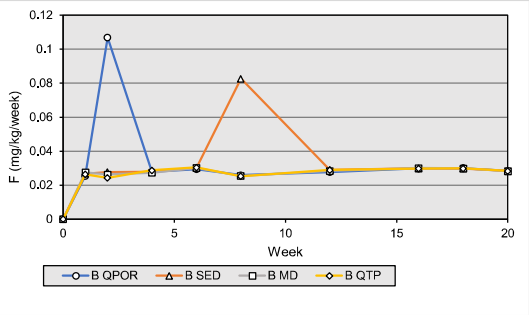
Plots

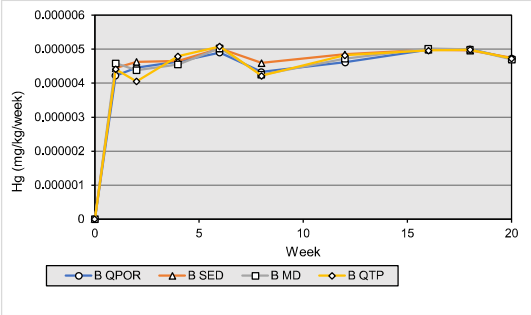
Figure C-1: Berry Waste Rock Humidity Cell Plots

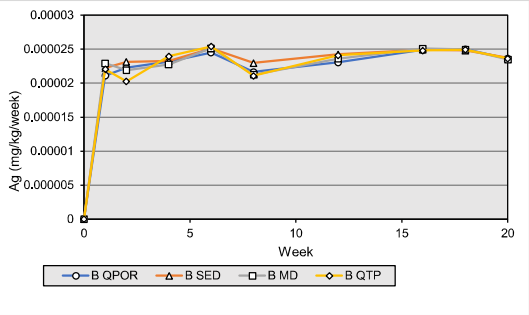


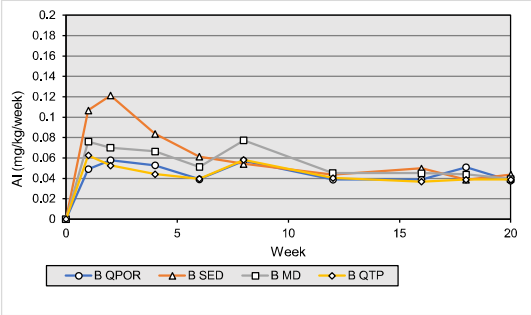


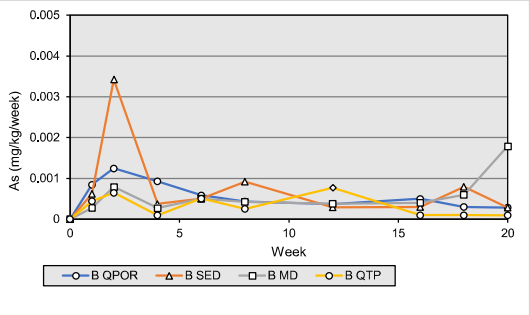


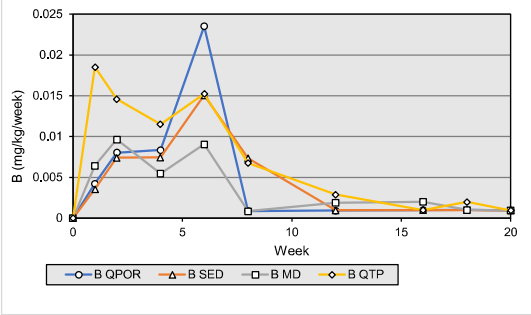


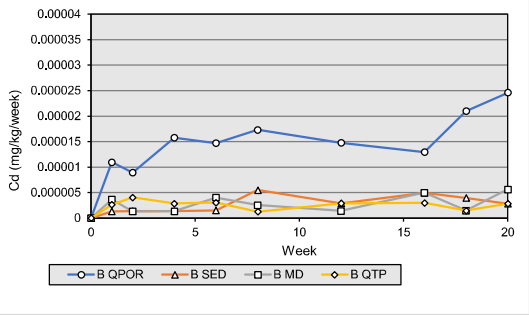






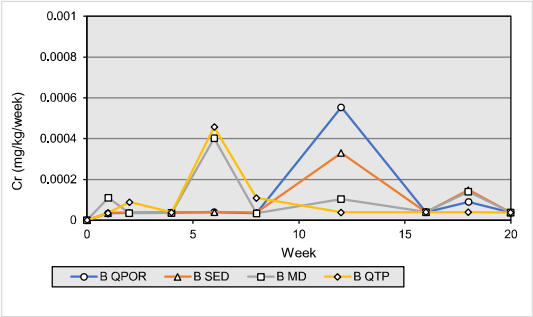


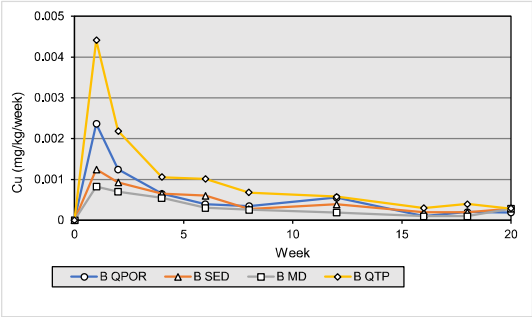


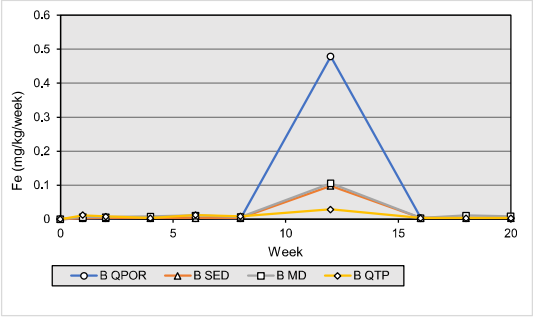


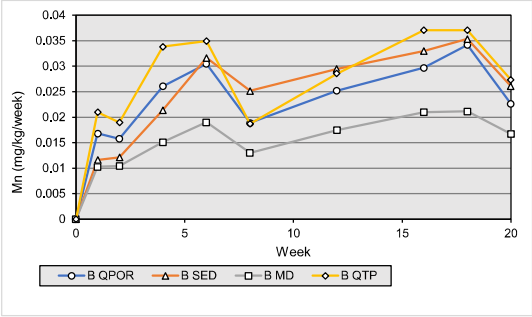
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

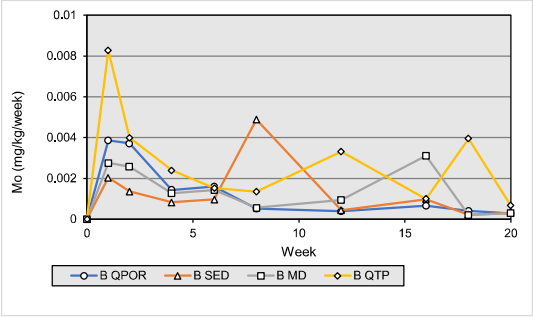
Figure C-1: Berry Waste Rock Humidity Cell Plots

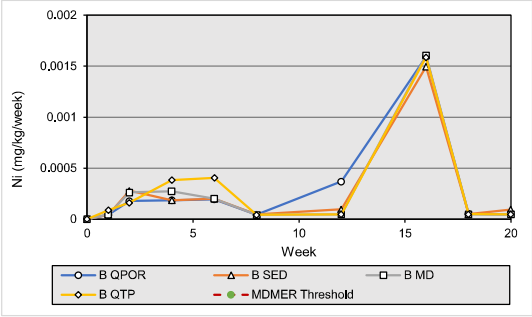


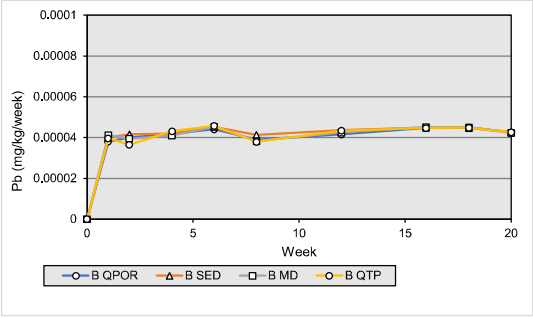


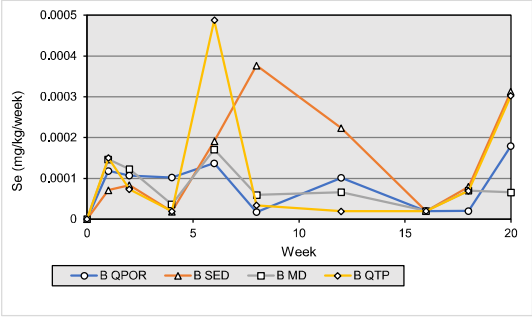


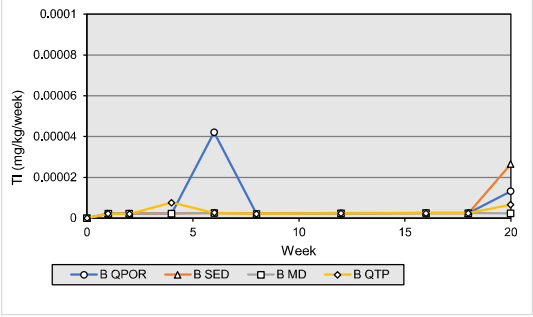


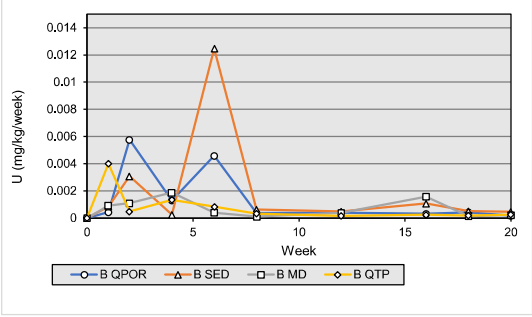






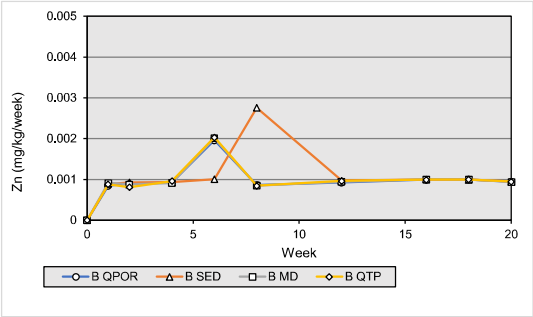


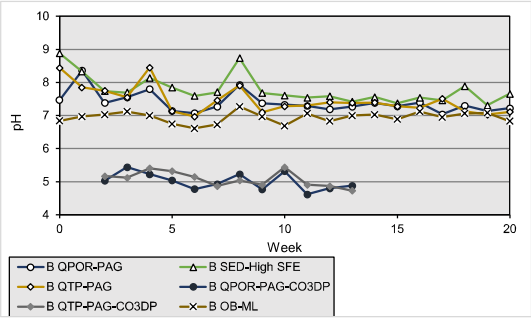


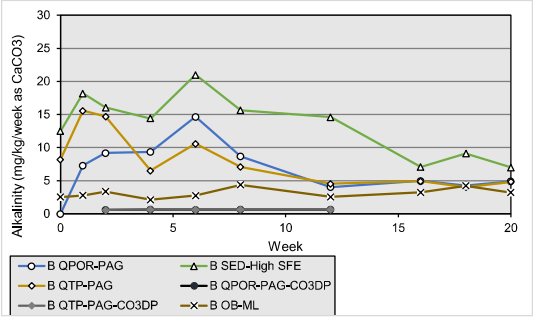


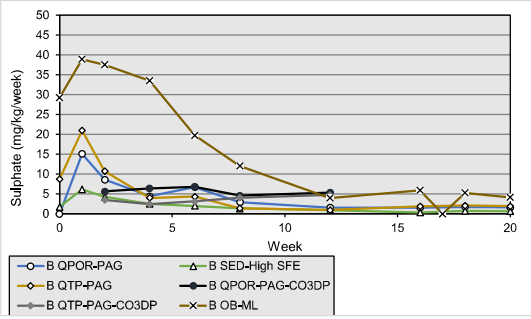
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

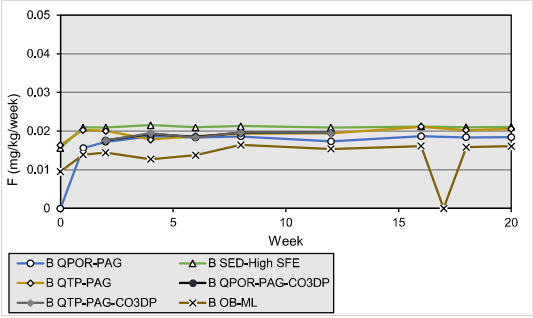
Figure C-1: Berry Waste Rock Humidity Cell Plots

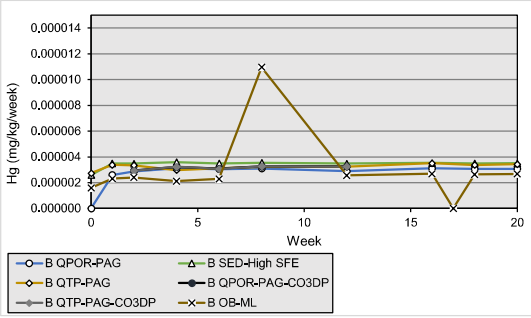


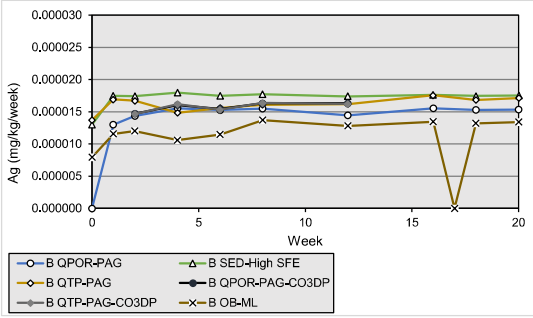


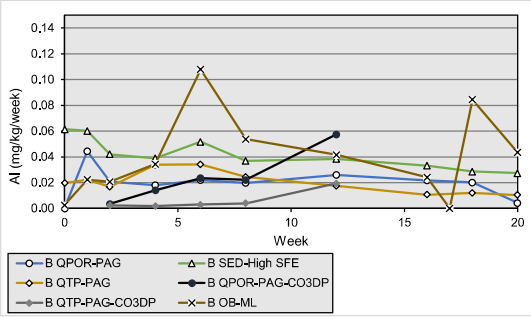


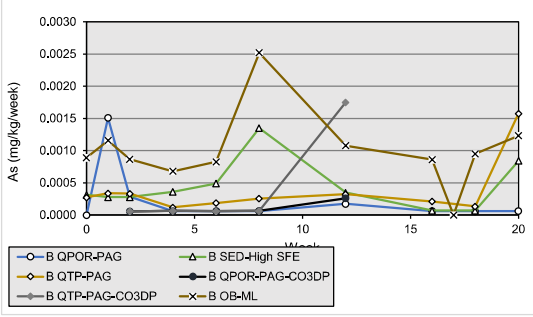


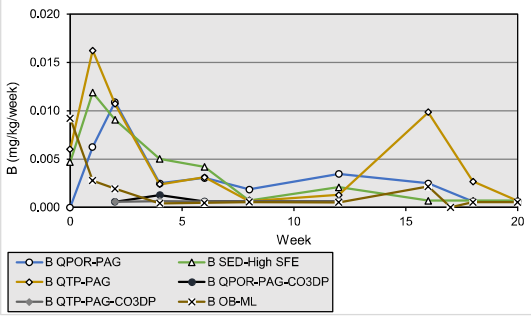






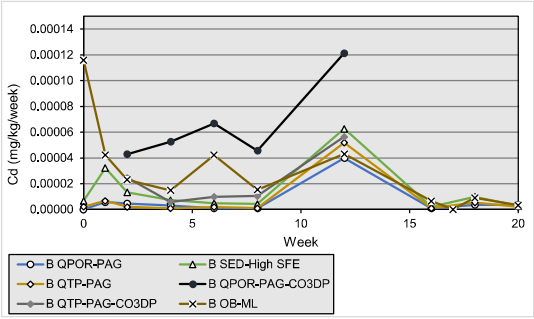


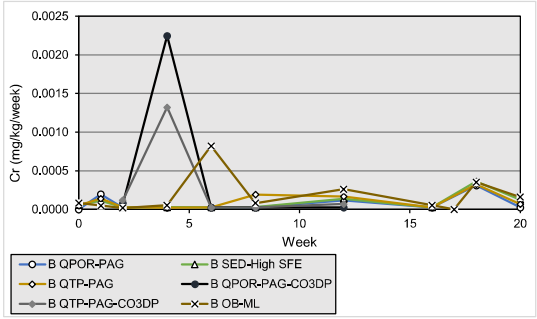


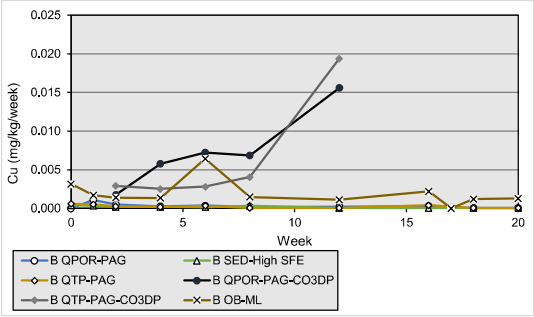


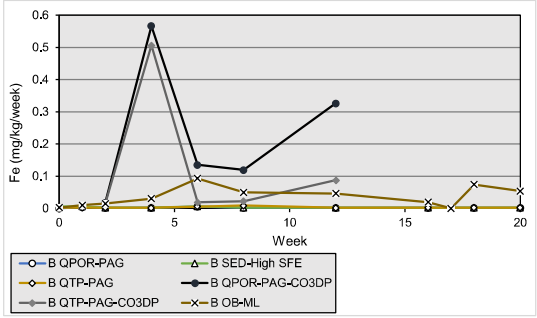
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

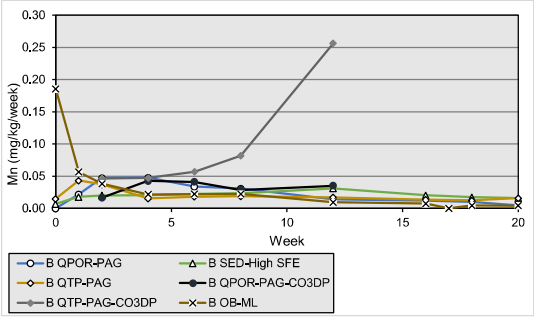
Figure C-1: Berry Waste Rock Humidity Cell Plots

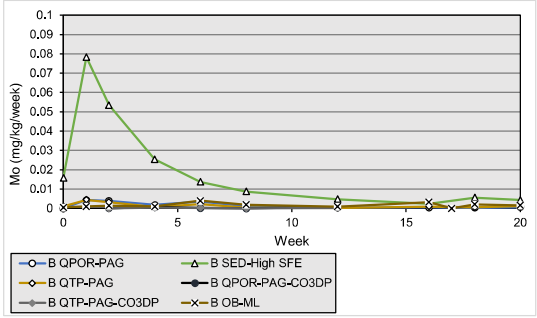


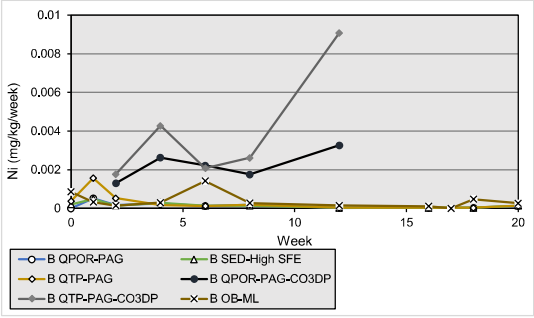


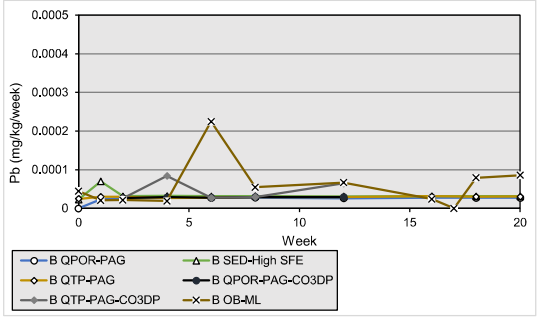


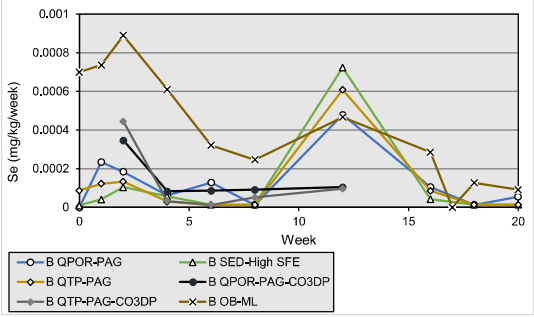


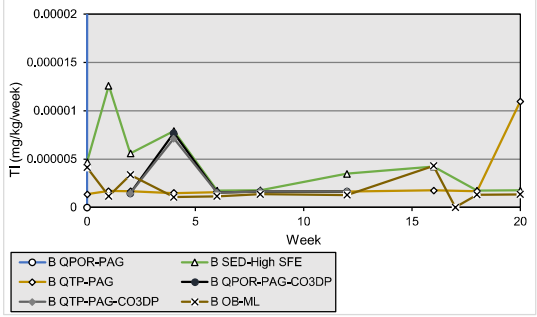






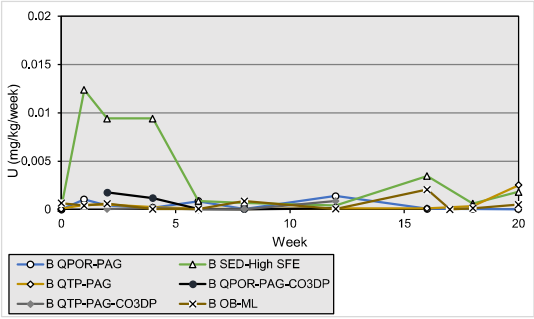


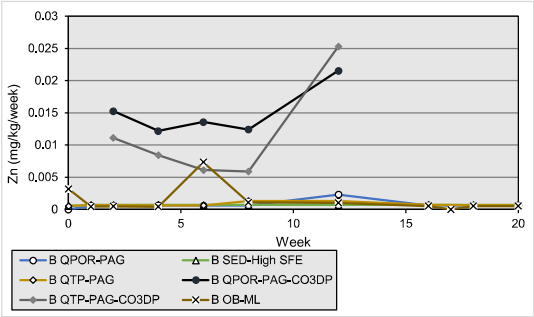




Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

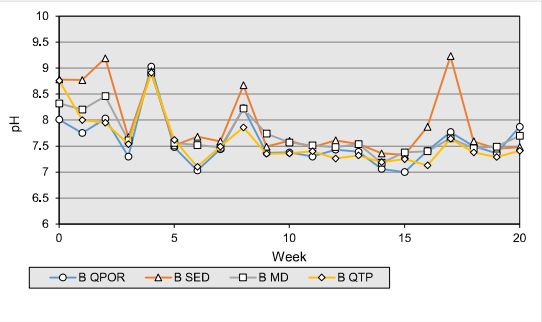
Figure C-1: Berry Waste Rock Humidity Cell Plots

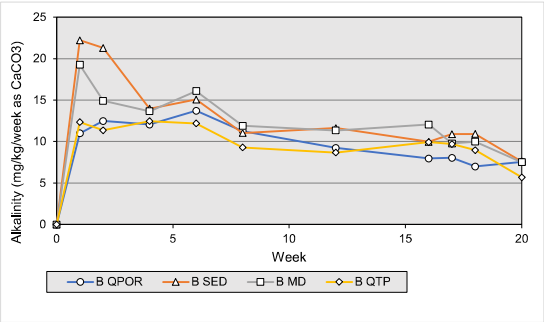


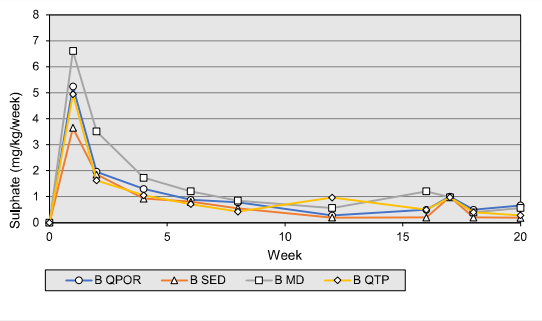


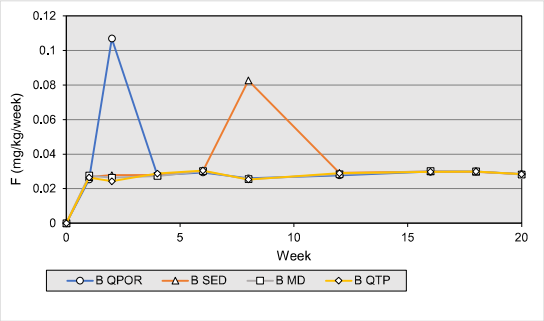
Note: Values below the respective detection limits (DLs) are shown as half DLs.

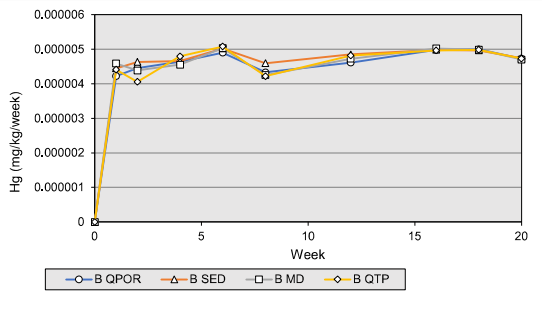
Figure C-1: Berry Waste Rock Humidity Cell Plots

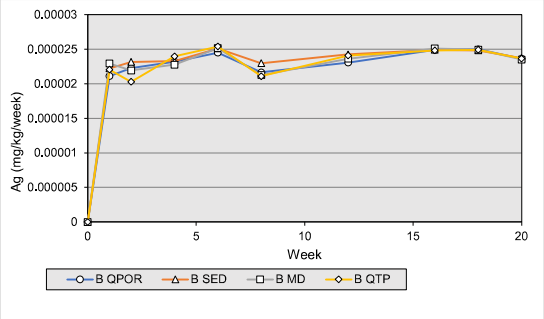


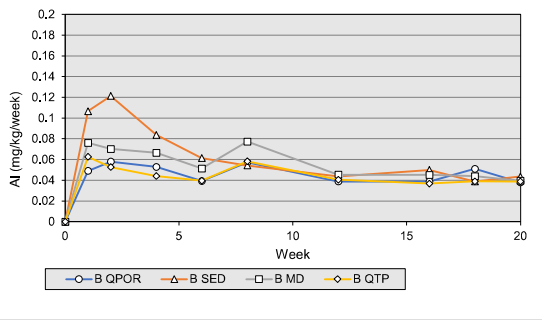


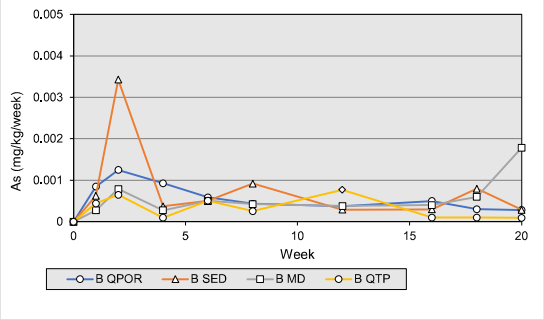


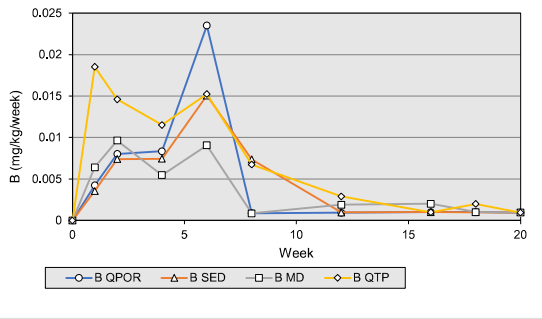


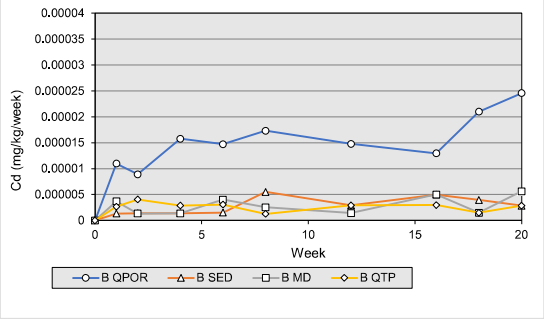






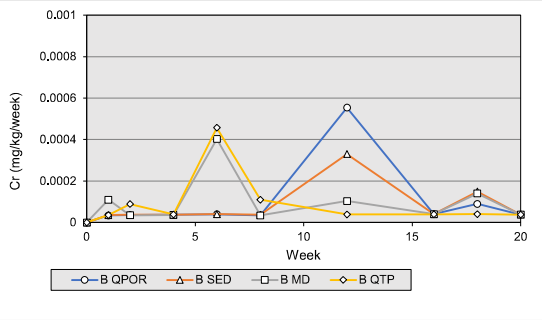


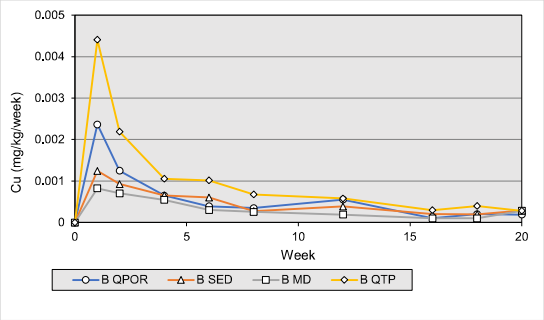


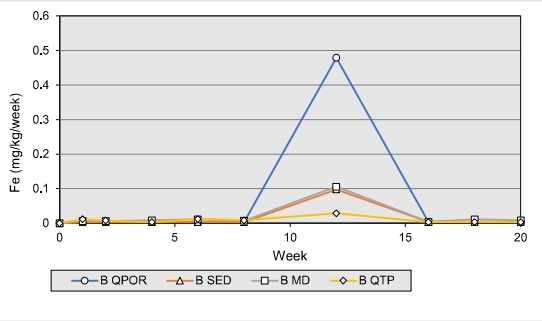


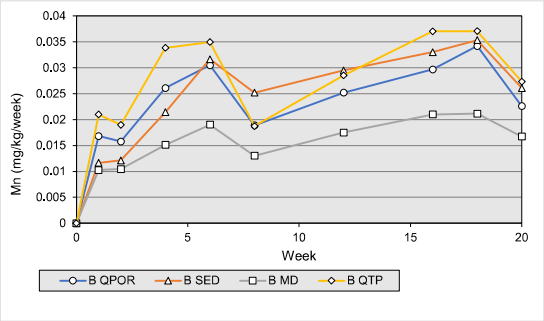
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

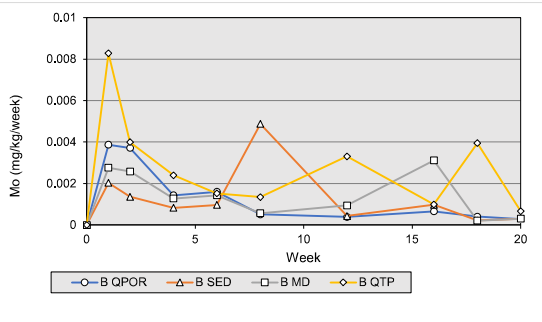
Figure C-1: Berry Waste Rock Humidity Cell Plots

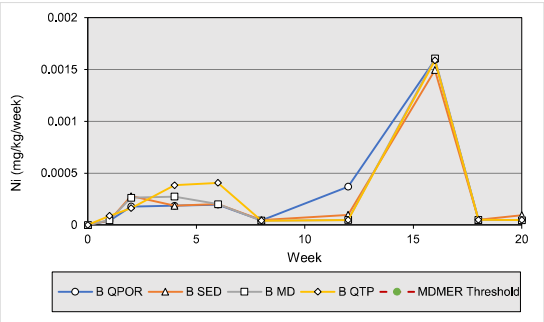


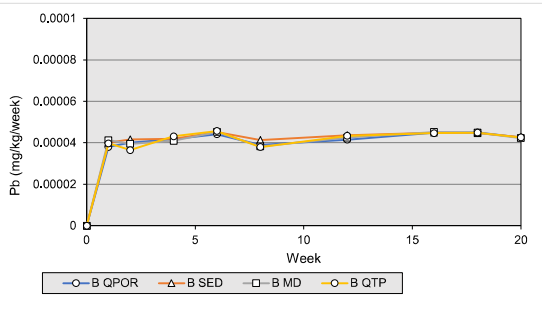


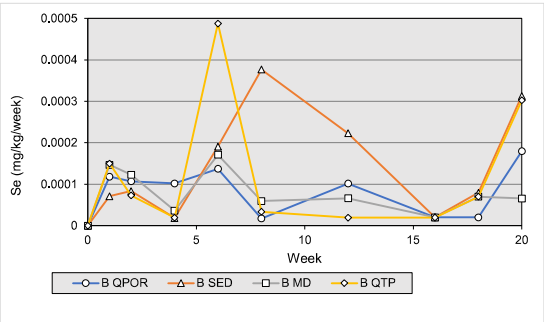


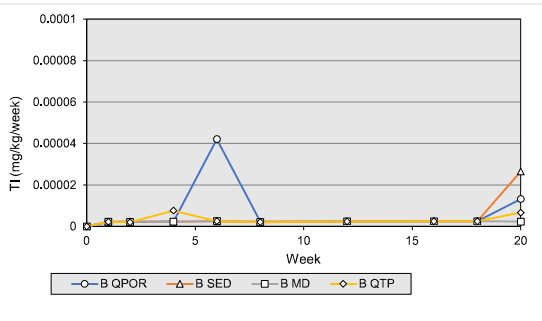


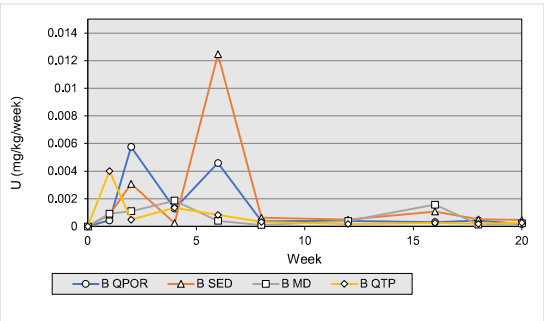






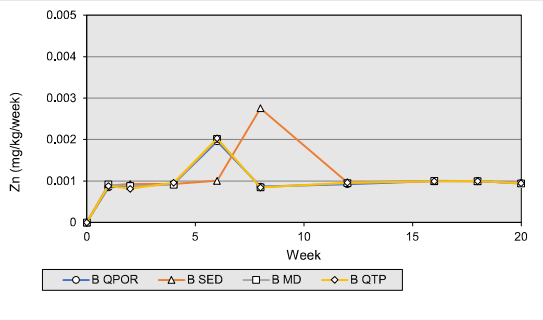


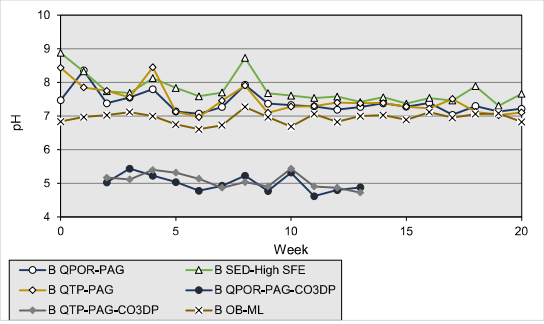


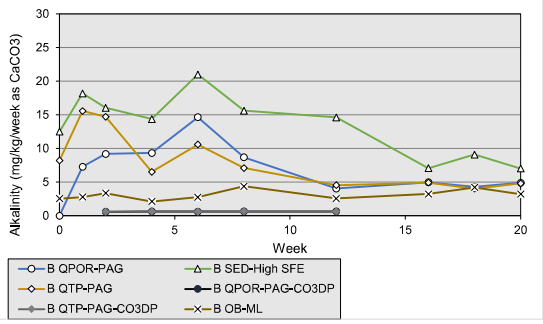


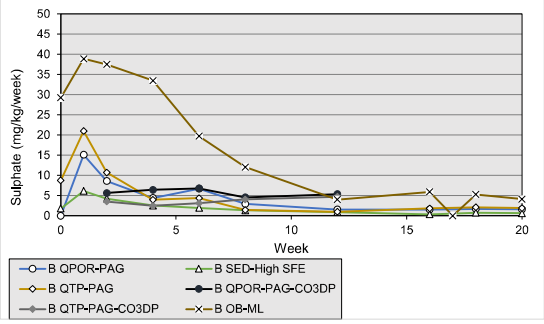
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

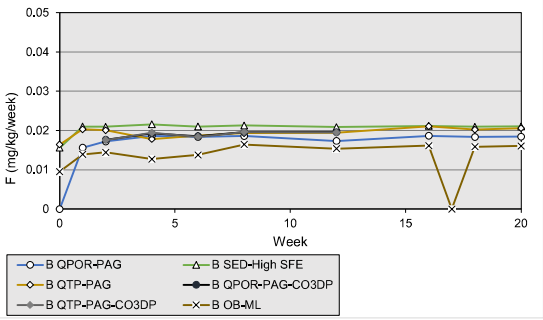
Figure C-1: Berry Waste Rock Humidity Cell Plots

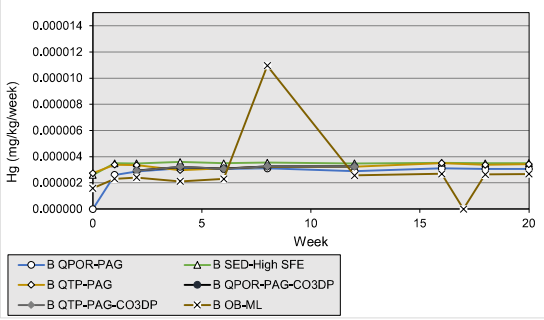


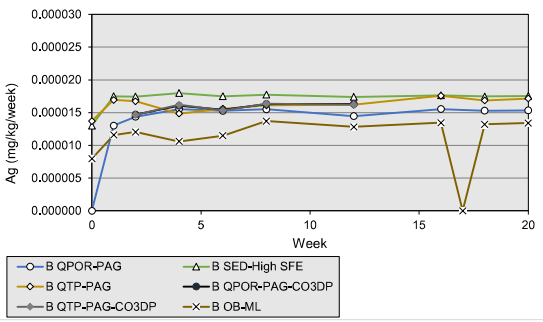


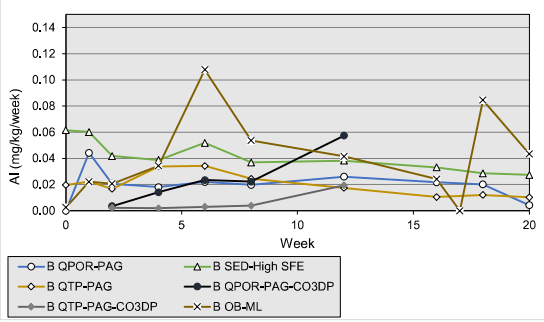


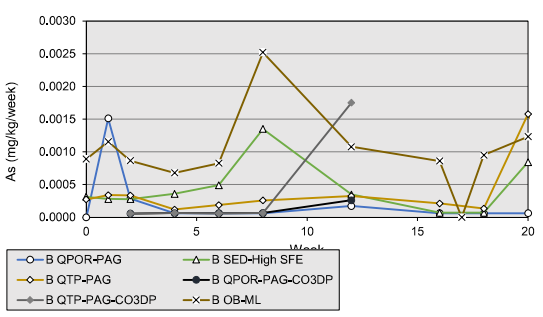


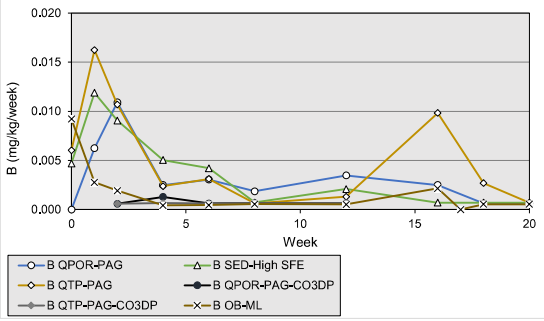






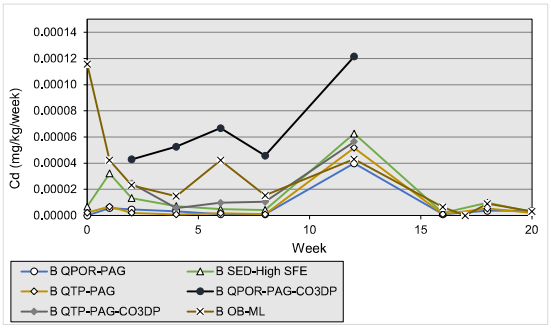


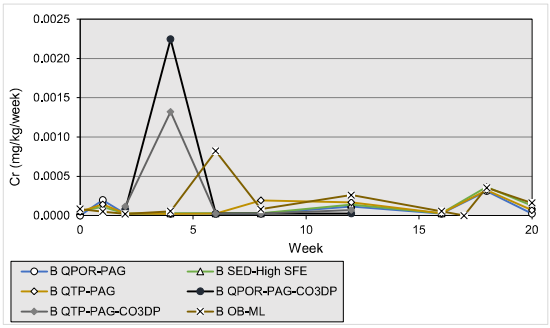


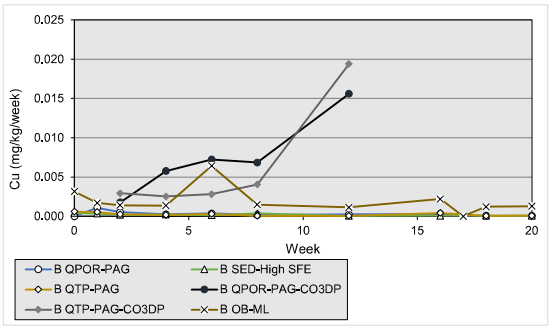


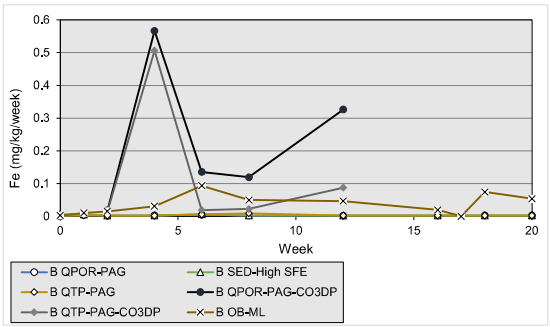
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

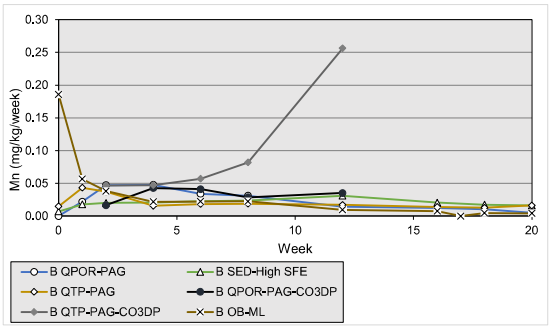
Figure C-1: Berry Waste Rock Humidity Cell Plots

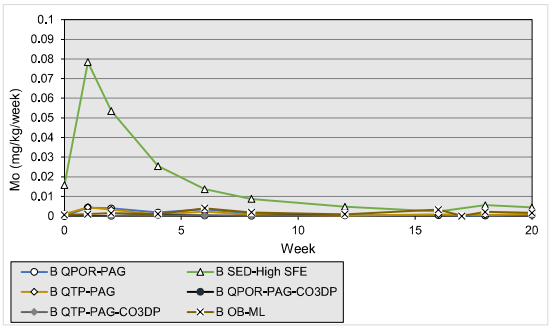


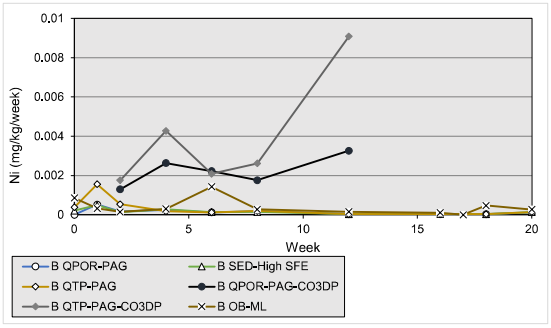


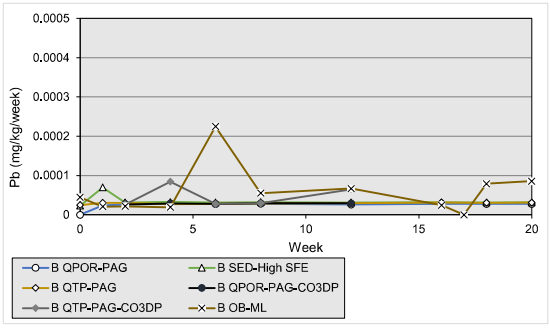


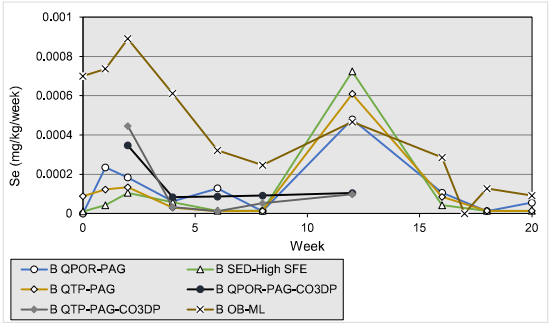


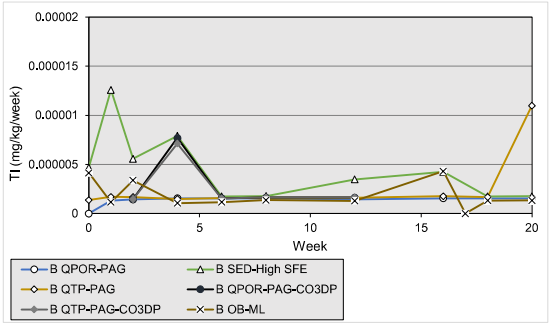






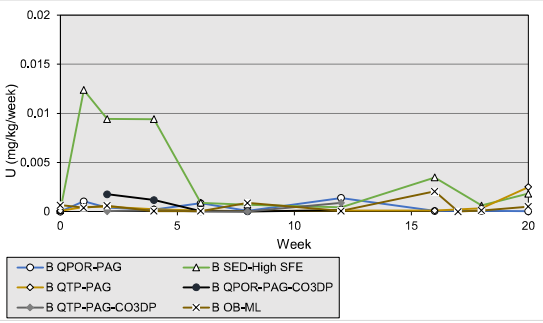


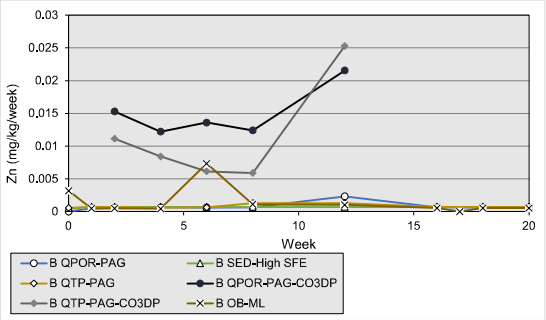




Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

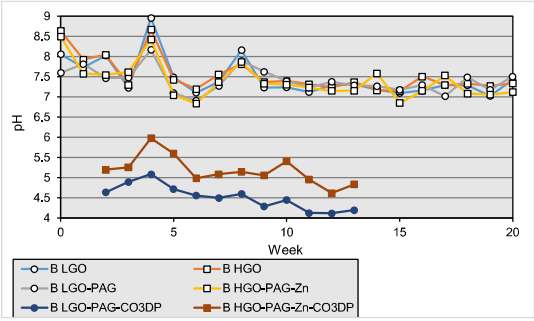
Figure C-1: Berry Waste Rock Humidity Cell Plots

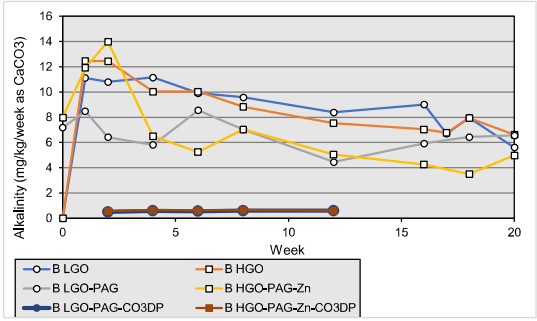


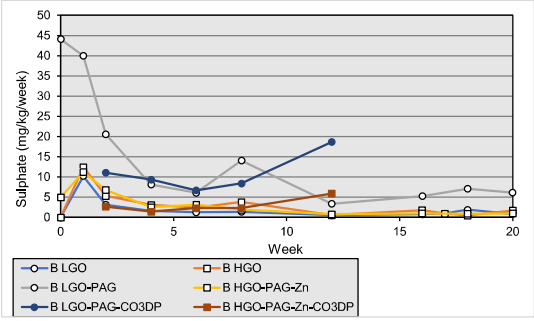


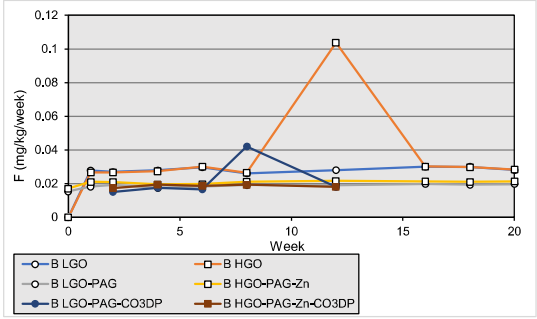
Note: Values below the respective detection limits (DLs) are shown as half DLs.

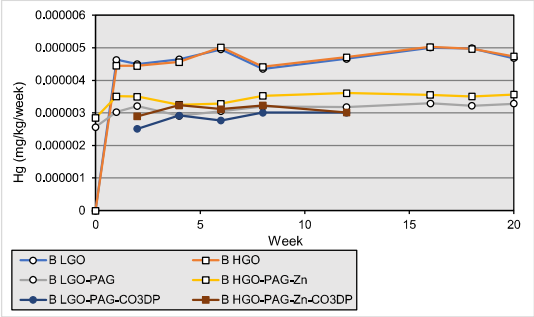
Figure C-2: Berry Ore and Overburden Humidity Cell Plots

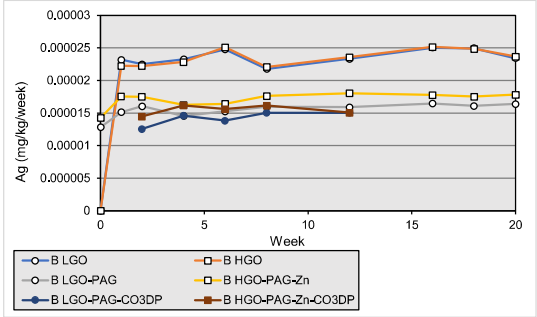


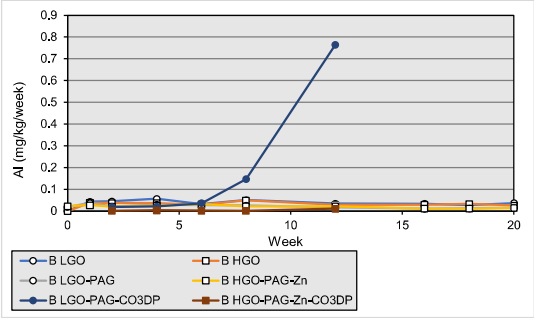


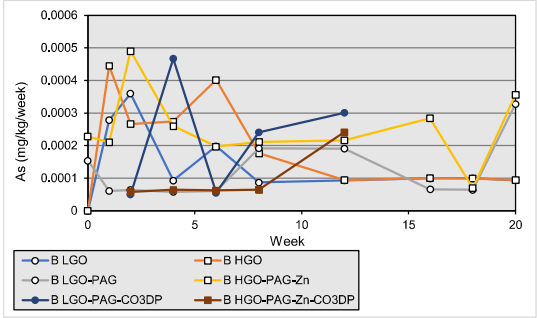


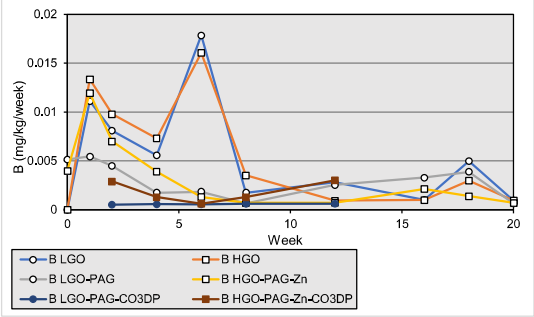


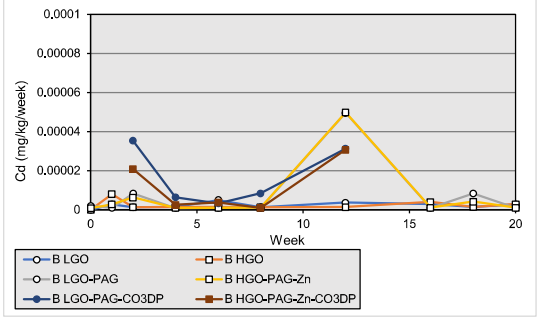






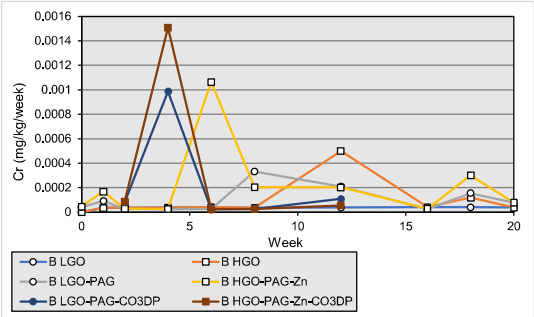


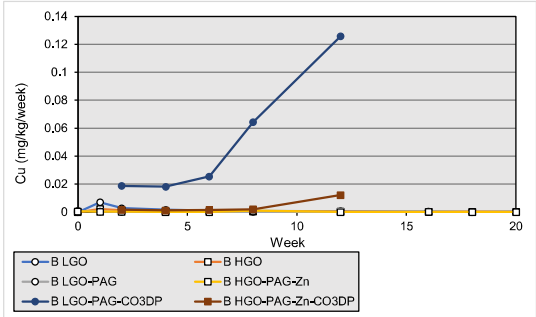


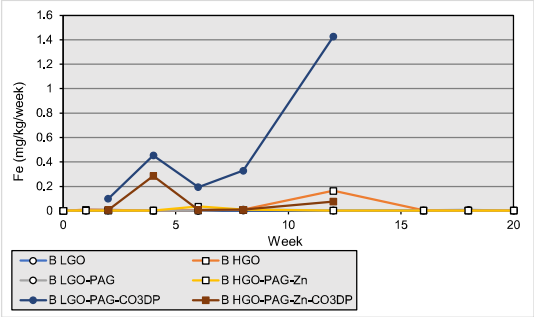


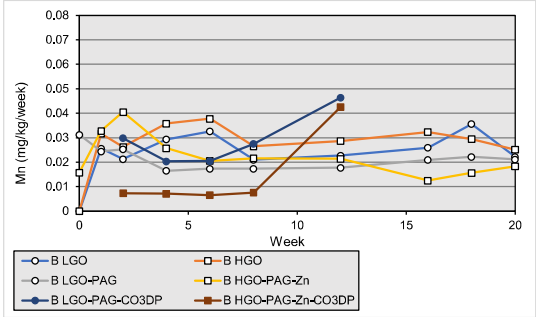
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

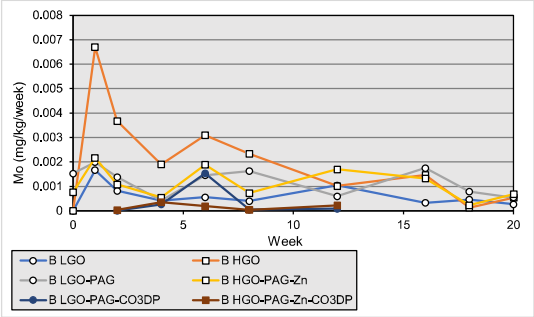
Figure C-2: Berry Ore and Overburden Humidity Cell Plots

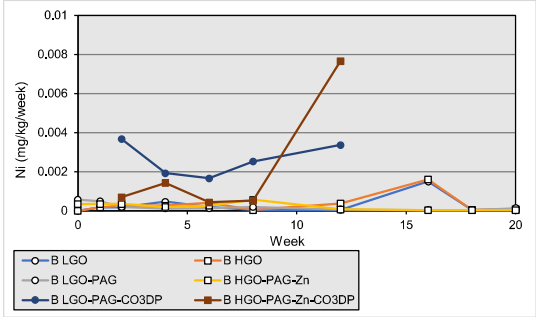


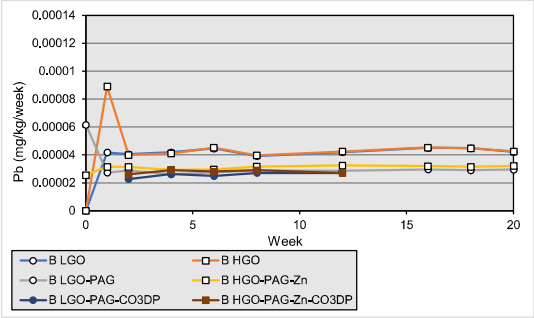


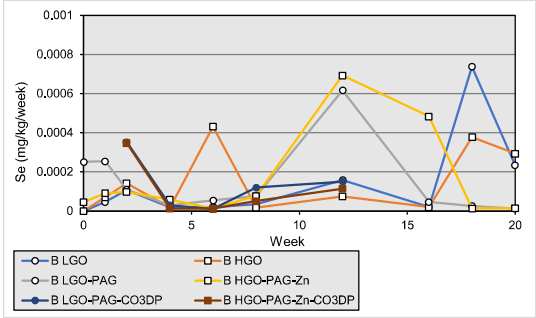


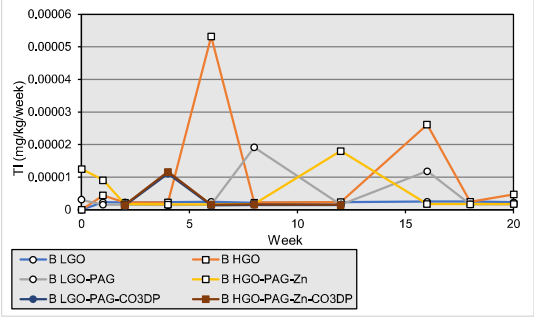


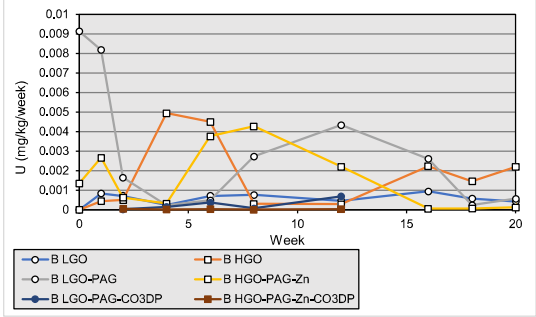






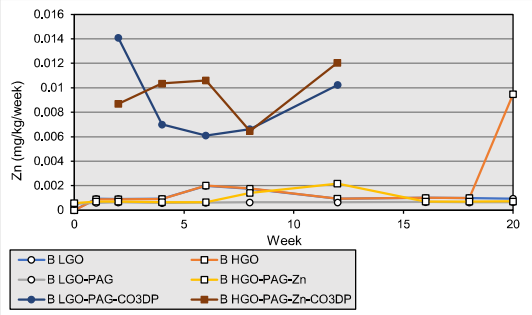






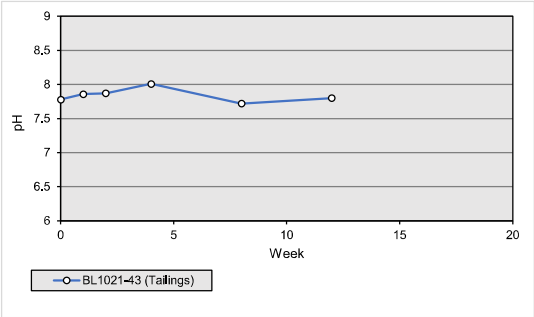
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

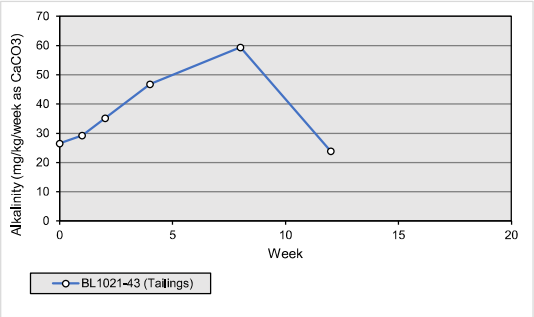
Figure C-2: Berry Ore and Overburden Humidity Cell Plots

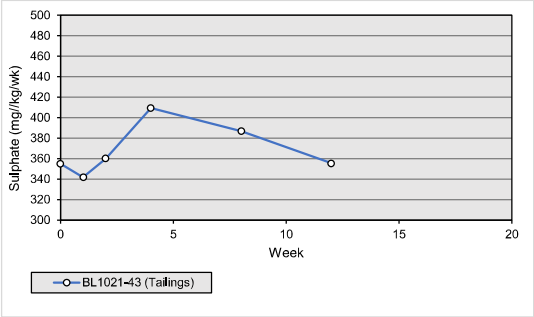


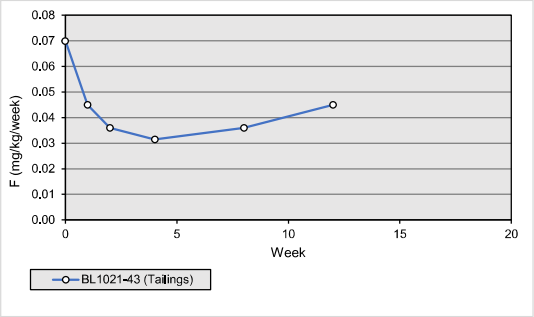
Note: Values below the respective detection limits (DLs) are shown as half DLs.

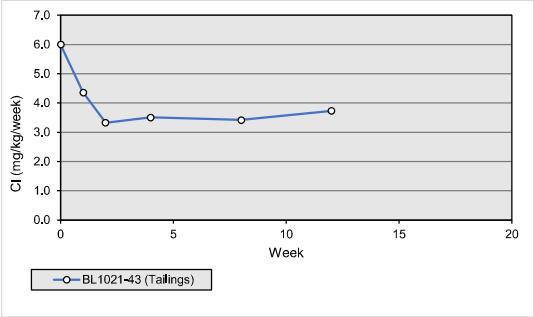
Figure C-3: Berry Tailings Subaqueous Cell Plots

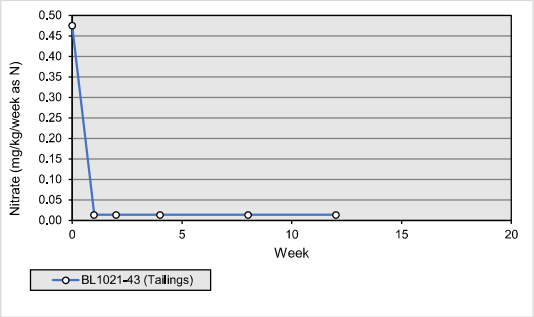


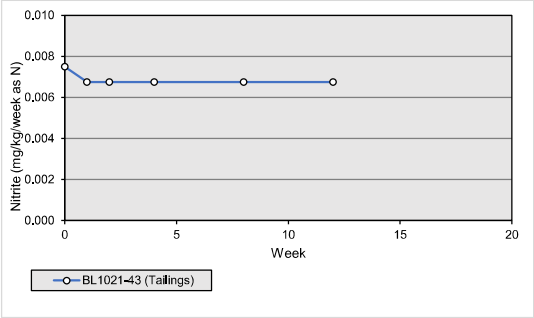


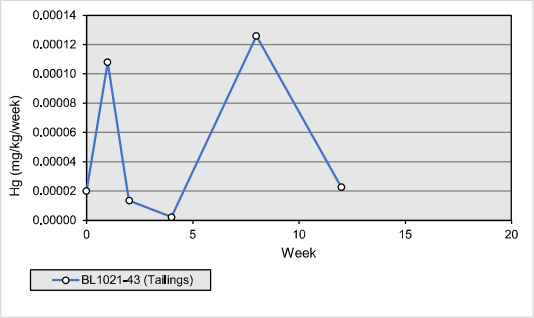


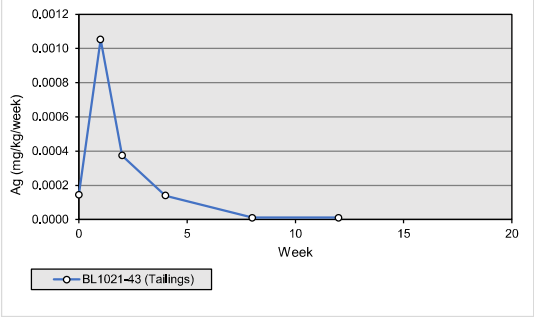


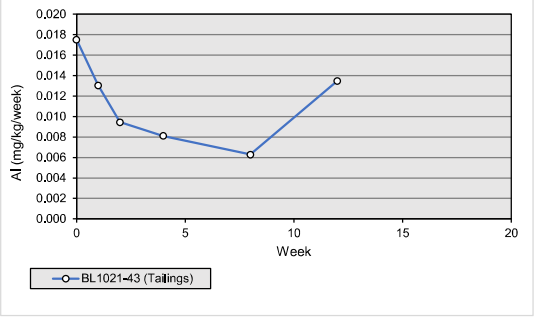






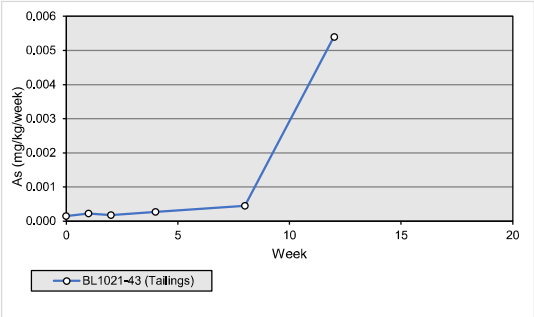


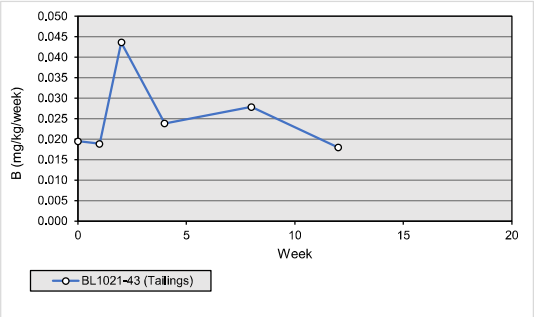


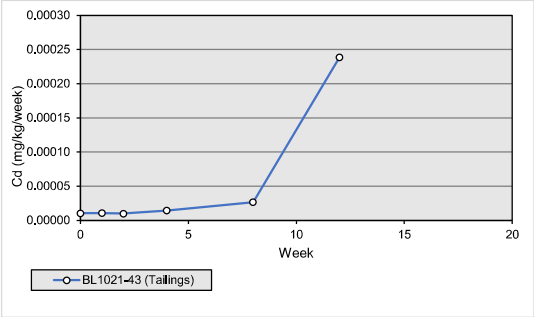


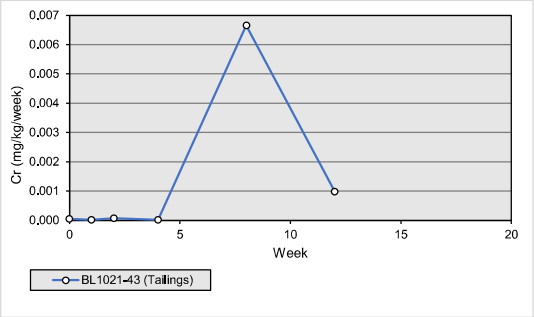
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

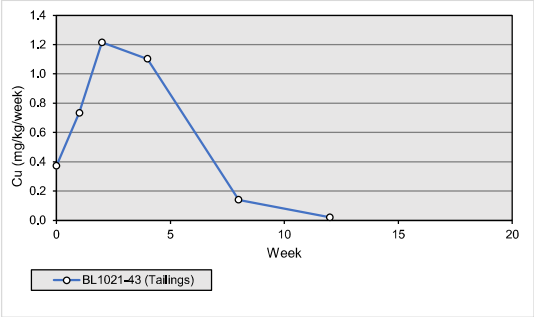
Figure C-3: Berry Tailings Subaqueous Cell Plots

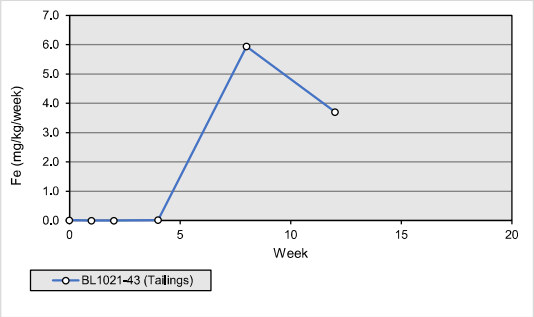


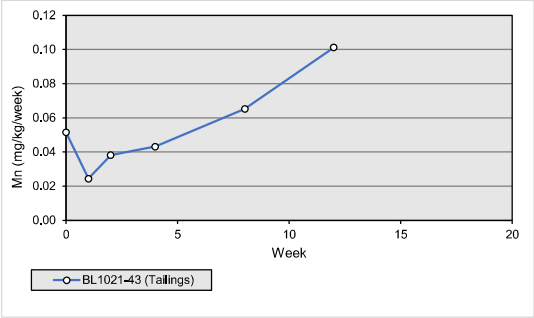


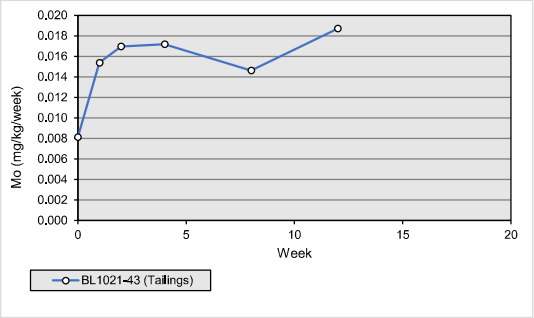


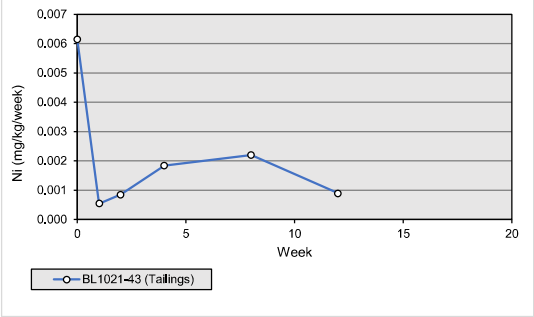


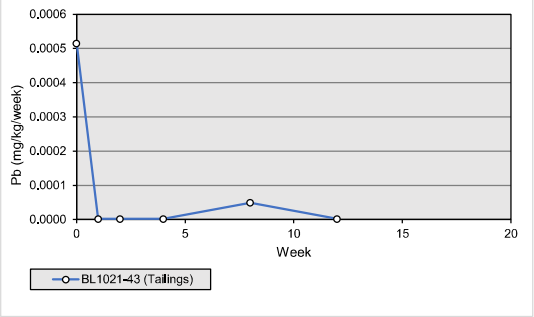






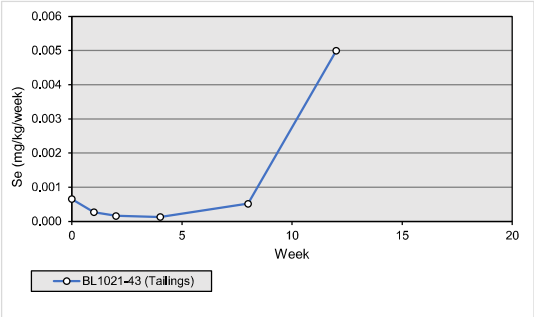


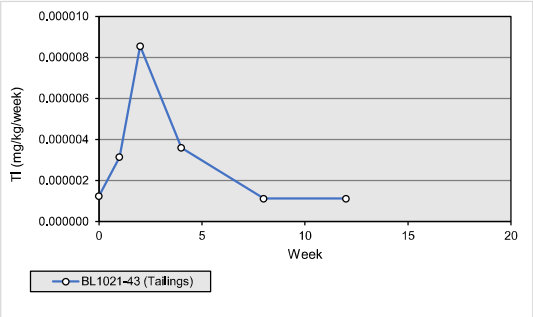


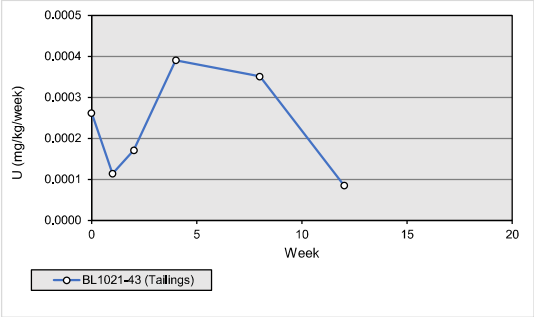


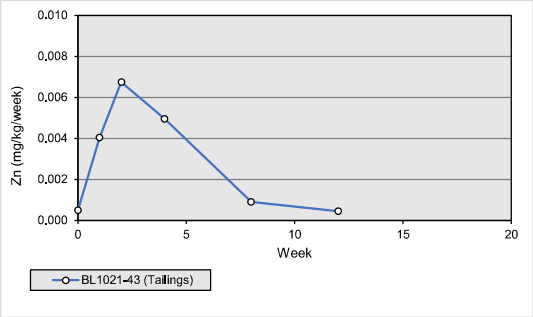
Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

Figure C-3: Berry Tailings Subaqueous Cell Plots









Note: Rates where concentrations where outflow concentrations were below the respective detection limits (DLs) were calcualted with half DLs.

APPENDIX D

Certificates Of Analyses

D.1 MINERALOGY

D.1 MINERALOGY

Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for:	*Environmental Services*
Project Number/ LIMS No.	*Custom XRD/MI4524-DEC22*
Sample Receipt:	*December 14, 2022*
Sample Analysis:	*January 5, 2023*
Reporting Date:	*January 19, 2023*

Instrument:	BRUKER AXS D8 Advance Diffractometer
Test Conditions:	Co radiation, 35 kV, 40 mA; Detector: LYNXEYE Regular Scanning: Step: 0.02°, Step time: 0.75s, 2θ range: 6-80°
Interpretations :	PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva and Topas software.
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

<original signed by>

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

<original signed by>

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

ACCREDITATION: SGS Natural Resources Lakefield is accredited to the requirements of ISO/IEC 17025 for specific tests as listed on our scope of accreditation, including geochemical, mineralogical and trade mineral tests. To view a list of the accredited methods, please visit the following website and search SGS Canada Inc. - Minerals: https://www.scc.ca/en/search/palcan.

Method Summary

The Rietveld Method of Mineral Identification by XRD (ME-LR-MIN-MET-MN-D05) method used by SGS Natural Resources is accredited to the requirements of ISO/IEC 17025.

Mineral Identification and Interpretation:

Mineral identification and interpretation involves matching the diffraction pattern of an unknown material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) database and released on software as Powder Diffraction Files (PDF).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds, except when internal standards have been added by request. Mineral proportions may be strongly influenced by crystallinity, crystal structure and preferred orientations. Mineral or compound identification and quantitative analysis results should be accompanied by supporting chemical assay data or other additional tests.

Quantitative Rietveld Analysis:

Quantitative Rietveld Analysis is performed by using Topas 4.2 (Bruker AXS), a graphics based profile analysis program built around a non-linear least squares fitting system, to determine the amount of different phases present in a multicomponent sample. Whole pattern analyses are predicated by the fact that the X-ray diffraction pattern is a total sum of both instrumental and specimen factors. Unlike other peak intensity-based methods, the Rietveld method uses a least squares approach to refine a theoretical line profile until it matches the obtained experimental patterns.

Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.05wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

Mineral/Compound	B QPOR-PAG DEC4524-01 (wt %)	B SED-High SFE DEC4524-02 (wt %)	B QTP-PAG DEC4524-03 (wt %)	B LGO-PAG DEC4524-04 (wt %)	B HGO-PAG-Zn DEC4524-05 (wt %)	B OB-ML DEC4524-06 (wt %)
Quartz	45.0	51.8	47.9	59.9	62.0	37.6
Albite	39.3	13.0	37.1	17.7	29.2	36.3
Chlorite	2.0	10.2	1.2	1.3	1.3	6.1
Pyrite	1.2	0.2	1.4	6.9	1.1	0.2
Muscovite	7.4	16.8	5.3	7.7	4.0	12.5
Laumontite	1.4	1.4	1.2	0.8	0.4	-
Calcite	1.0	4.0	3.4	2.1	1.5	0.0
Microcline	0.9	1.4	1.4	0.2	0.2	0.6
Gibbsite	0.3	-	-	-	-	-
Calcite magnesian	1.7	-	0.0	1.1	0.3	-
Magnetite	-	1.2	0.5	1.8	-	0.9
Diaspore	-	-	0.5	0.5	-	-
Actinolite	-	-	-	-	-	5.2
Ankerite	-	-	-	-	-	0.5
TOTAL	100	100	100	100	100	100

Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

Mineral/Compound	Formula
Quartz	SiO_2
Albite	$NaAlSi_3O_8$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Pyrite	FeS_2
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Laumontite	$Ca(Al_2Si_4O_{12})\cdot 4H_2O$
Calcite	$CaCO_3$
Microcline	$KAlSi_3O_8$
Gibbsite	$Al(OH)_3$
Calcite magnesian	$(Ca,Mg)CO_3$
Magnetite	Fe_3O_4
Diaspore	aAlO.OH
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$
Ankerite	$CaFe(CO_3)_2$

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

Mineral/Compound	B QPOR-PAG-DUP DEC4524-07 (wt %)	B SED-High SFE- DUP DEC4524-08 (wt %)	B QTP-PAG-DUP DEC4524-09 (wt %)	B LGO-PAG-DUP DEC4524-10 (wt %)	B HGO-PAG-Zn-DUP DEC4524-11 (wt %)	B OB-ML- DUP DEC4524-12 (wt %)
Quartz	45.5	51.4	48.1	58.6	61.7	39.2
Albite	39.8	13.8	37.7	19.0	29.6	33.2
Chlorite	2.0	10.3	1.4	1.1	1.2	7.5
Pyrite	1.3	0.3	1.2	6.2	0.8	0.1
Muscovite	7.4	17.0	5.9	9.2	4.7	13.5
Laumontite	1.4	1.2	1.1	0.8	0.2	-
Calcite	0.8	3.7	3.1	2.7	1.2	0.1
Microcline	0.5	1.0	0.6	0.2	0.3	0.5
Gibbsite	0.3	-	-	-	-	-
Calcite magnesian	1.0	-	0.0	0.4	0.3	-
Magnetite	-	1.3	0.5	1.6	-	0.6
Diaspore	-	-	0.3	0.2	-	-
Actinolite	-	-	-	-	-	4.7
Ankerite	-	-	-	-	-	0.6
TOTAL	100	100	100	100	100	100

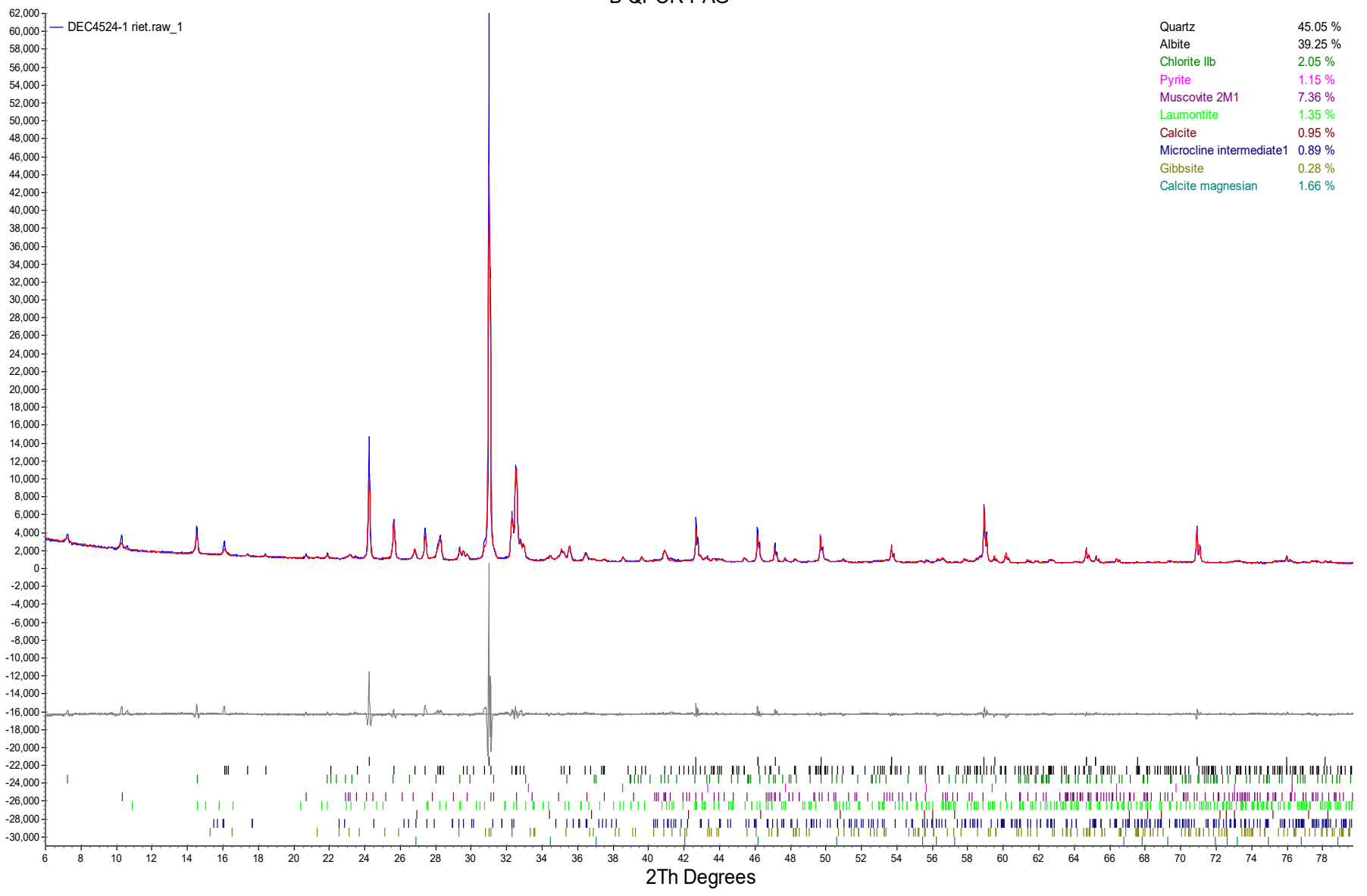
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

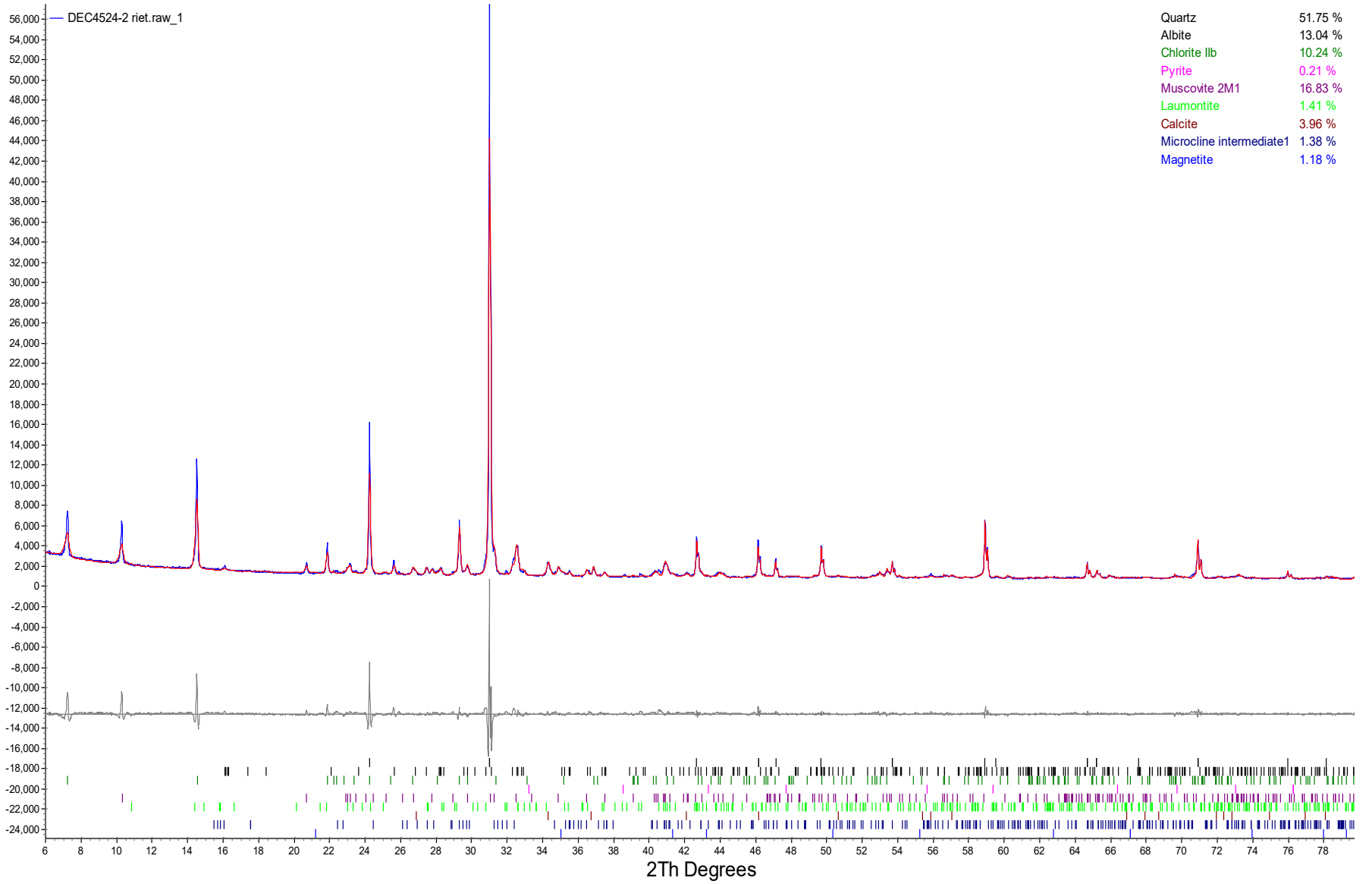
Mineral/Compound	Formula
Quartz	SiO_2
Albite	$NaAlSi_3O_8$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Pyrite	FeS_2
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Laumontite	$Ca(Al_2Si_4O_{12})\cdot 4H_2O$
Calcite	$CaCO_3$
Microcline	$KAlSi_3O_8$
Gibbsite	$Al(OH)_3$
Calcite magnesian	$(Ca,Mg)CO_3$
Magnetite	Fe_3O_4
Diaspore	aAlO.OH
Actinolite	$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$
Ankerite	$CaFe(CO_3)_2$

B QPOR-PAG



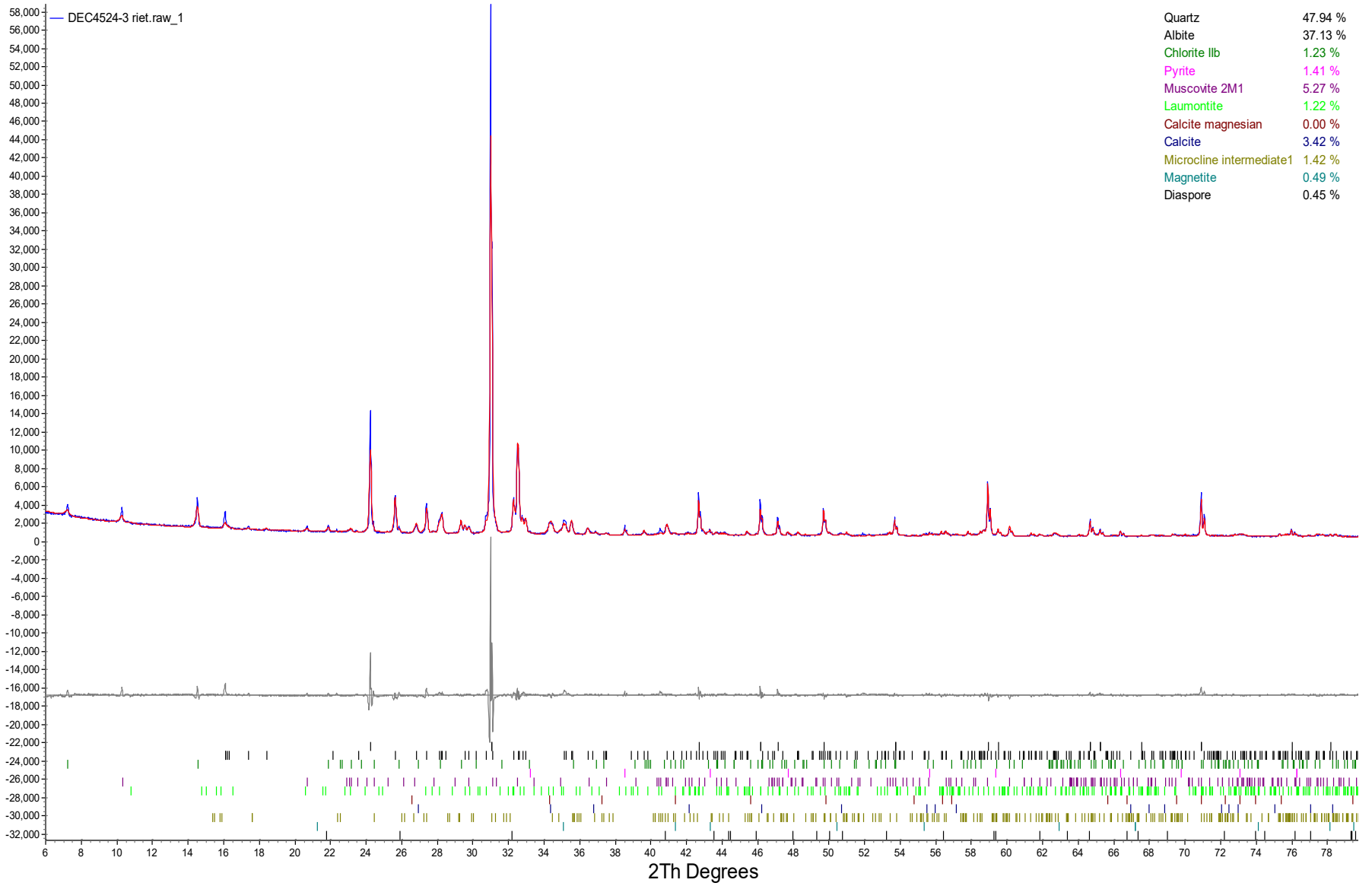
Quartz	45.05 %
Albite	39.25 %
Chlorite IIb	2.05 %
Pyrite	1.15 %
Muscovite 2M1	7.36 %
Laumontite	1.35 %
Calcite	0.95 %
Microcline intermediate1	0.89 %
Gibbsite	0.28 %
Calcite magnesian	1.66 %

B SED-High SFE



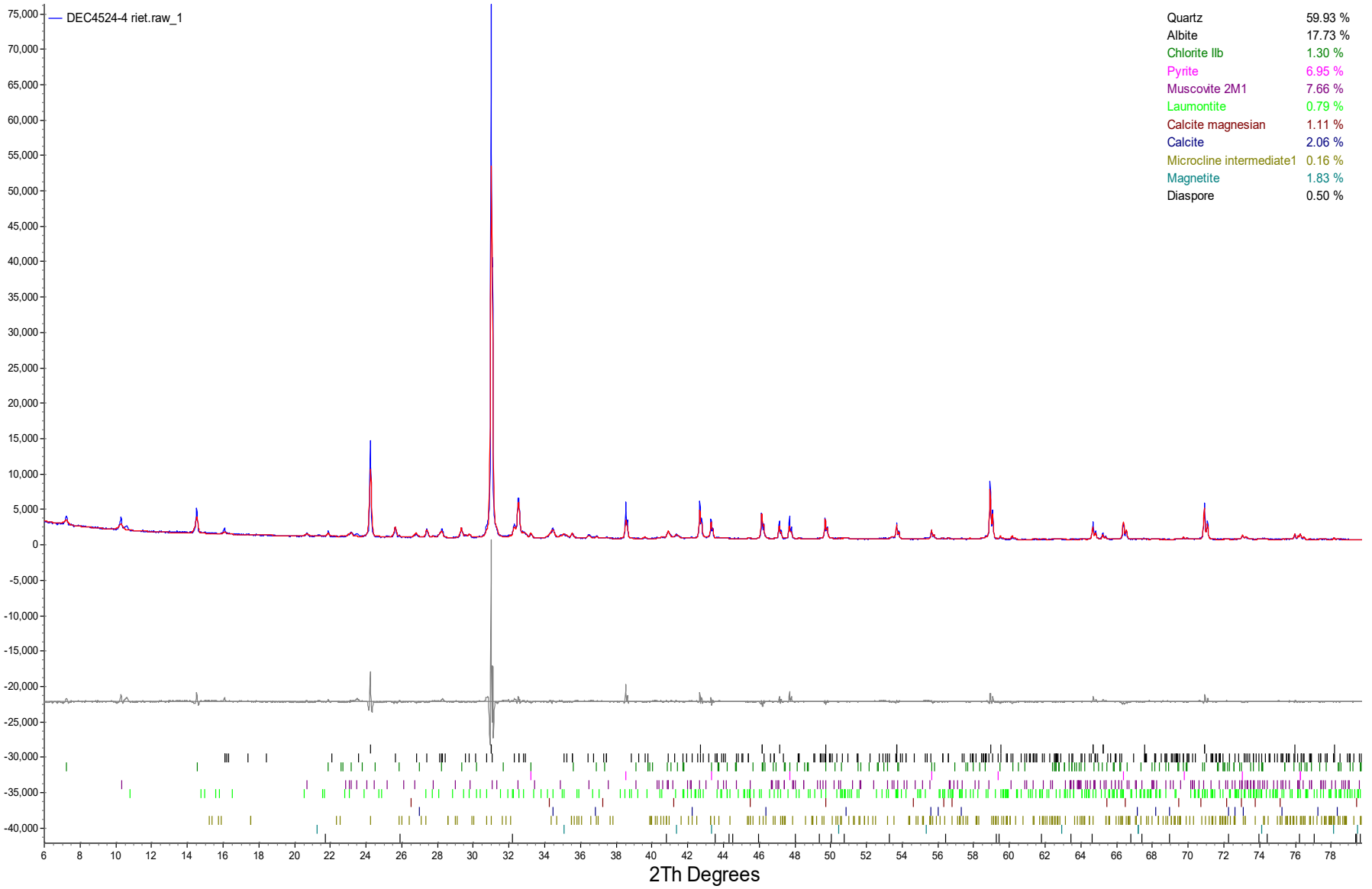
Quartz	51.75 %
Albite	13.04 %
Chlorite IIb	10.24 %
Pyrite	0.21 %
Muscovite 2M1	16.83 %
Laumontite	1.41 %
Calcite	3.96 %
Microcline intermediate1	1.38 %
Magnetite	1.18 %

B QTP-PAG



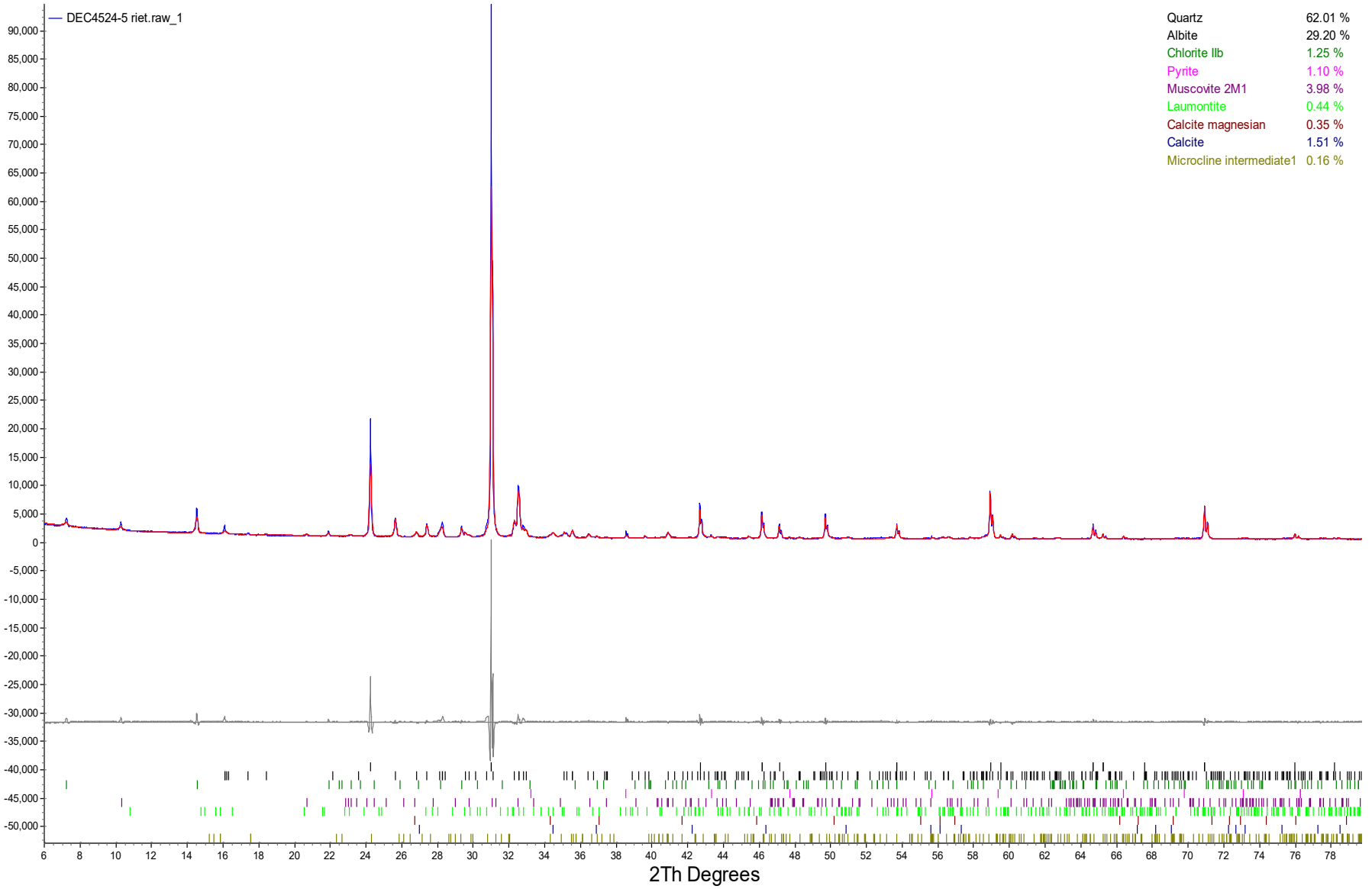
Quartz	47.94 %
Albite	37.13 %
Chlorite IIb	1.23 %
Pyrite	1.41 %
Muscovite 2M1	5.27 %
Laumontite	1.22 %
Calcite magnesian	0.00 %
Calcite	3.42 %
Microcline intermediate1	1.42 %
Magnetite	0.49 %
Diaspore	0.45 %

B LGO-PAG

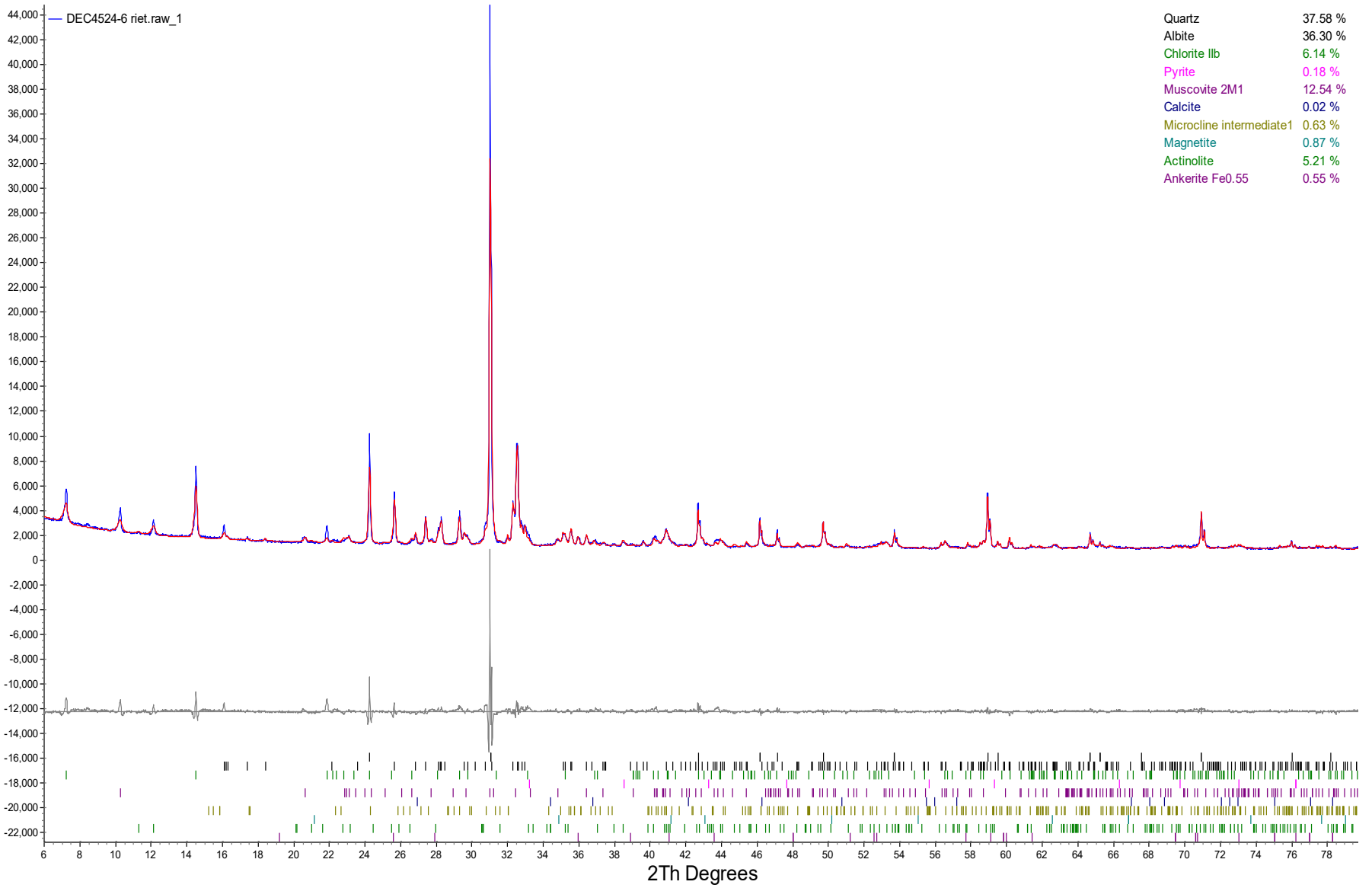


Quartz	59.93 %
Albite	17.73 %
Chlorite IIb	1.30 %
Pyrite	6.95 %
Muscovite 2M1	7.66 %
Laumontite	0.79 %
Calcite magnesian	1.11 %
Calcite	2.06 %
Microcline intermediate1	0.16 %
Magnetite	1.83 %
Diaspore	0.50 %

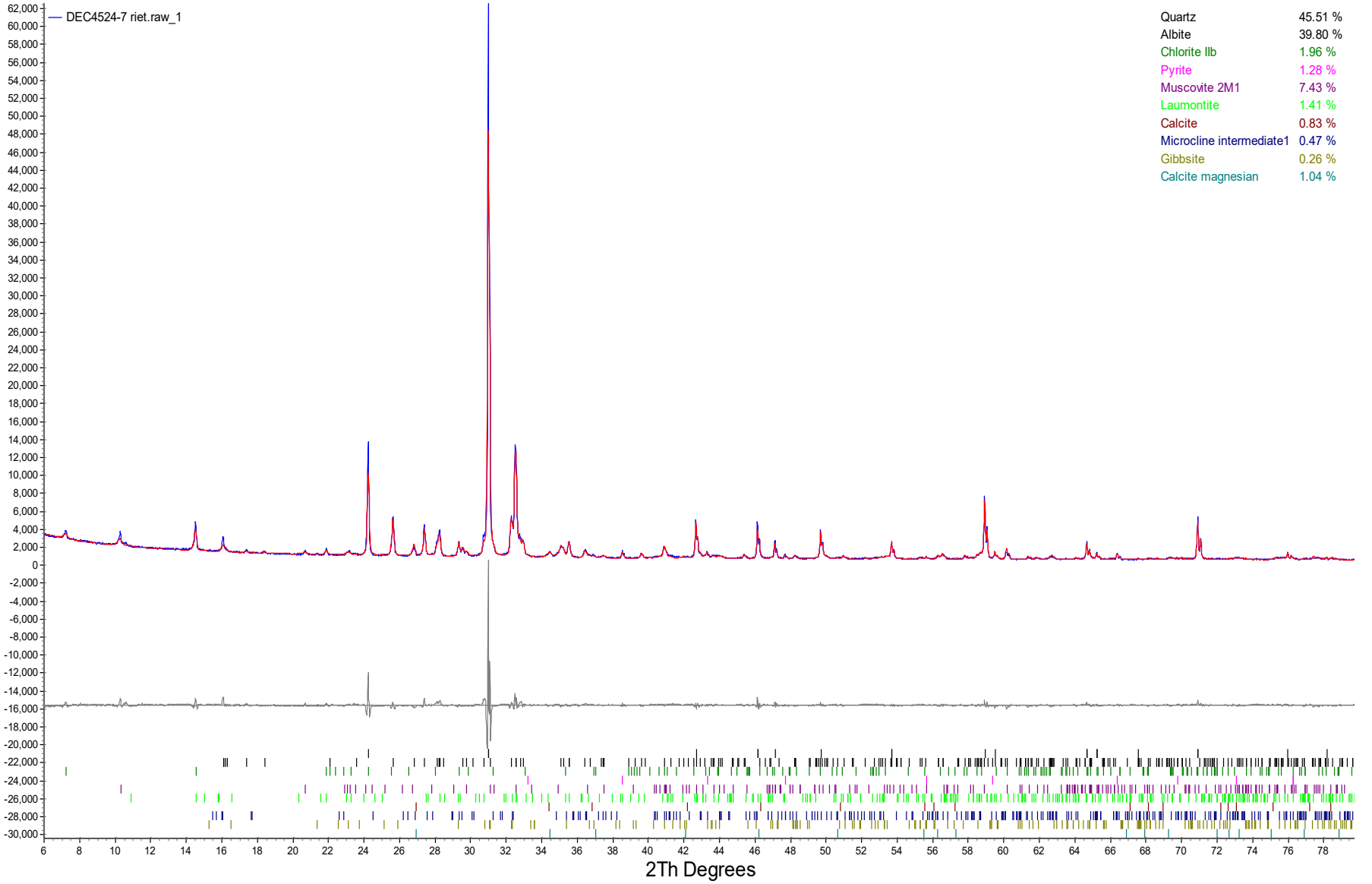
B HGO-PAG-Zn


DEC4524-5 riet.raw_1
Quartz 62.01 %
Albite 29.20 %
Chlorite IIb 1.25 %
Pyrite 1.10 %
Muscovite 2M1 3.98 %
Laumontite 0.44 %
Calcite magnesian 0.35 %
Calcite 1.51 %
Microcline intermediate1 0.16 %
2Th Degrees

B OB-ML

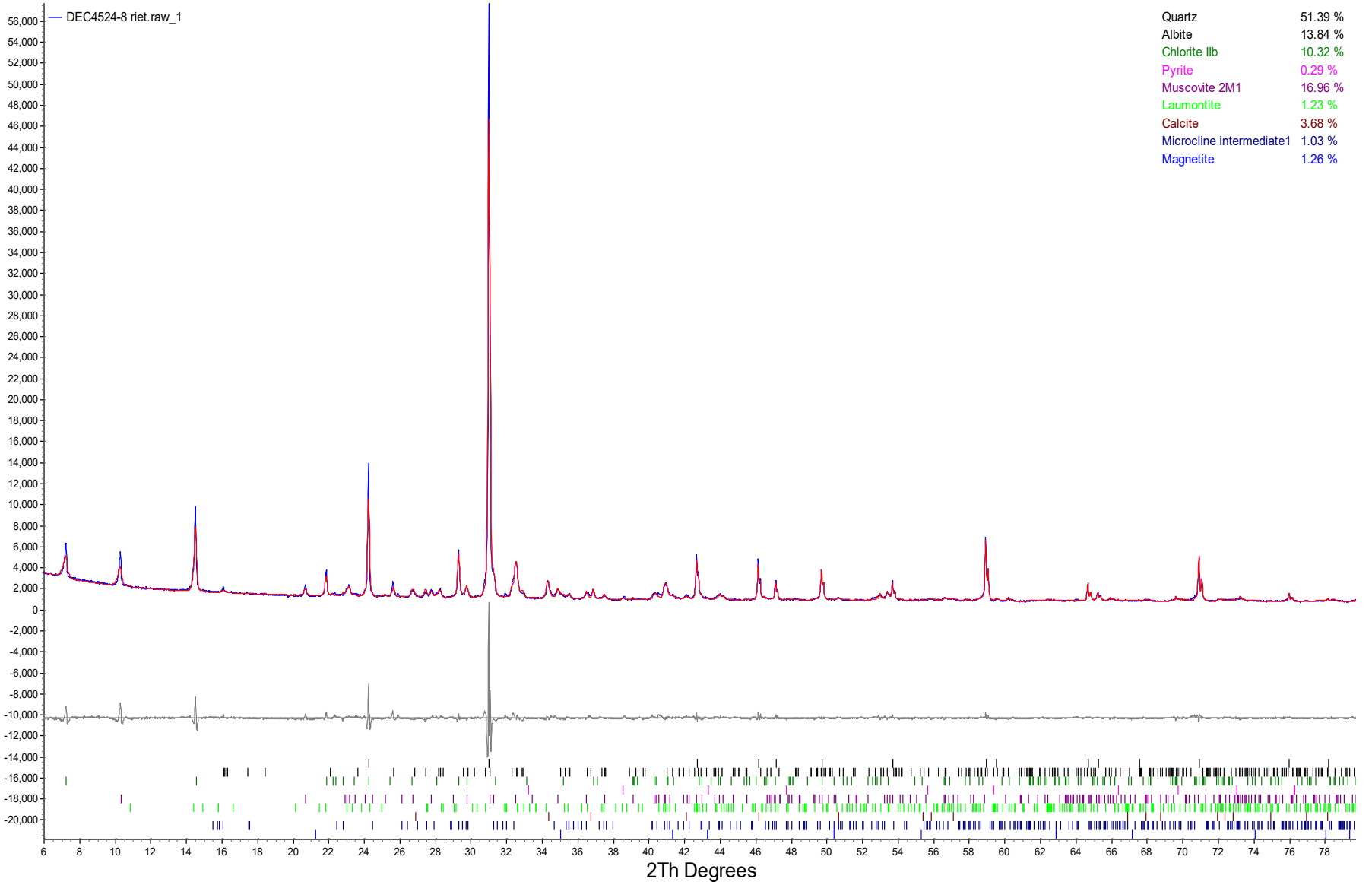

DEC4524-6 riet.raw_1
Quartz 37.58 %
Albite 36.30 %
Chlorite IIb 6.14 %
Pyrite 0.18 %
Muscovite 2M1 12.54 %
Calcite 0.02 %
Microcline intermediate1 0.63 %
Magnetite 0.87 %
Actinolite 5.21 %
Ankerite Fe0.55 0.55 %
2Th Degrees

B QPOR-PAG - DUP



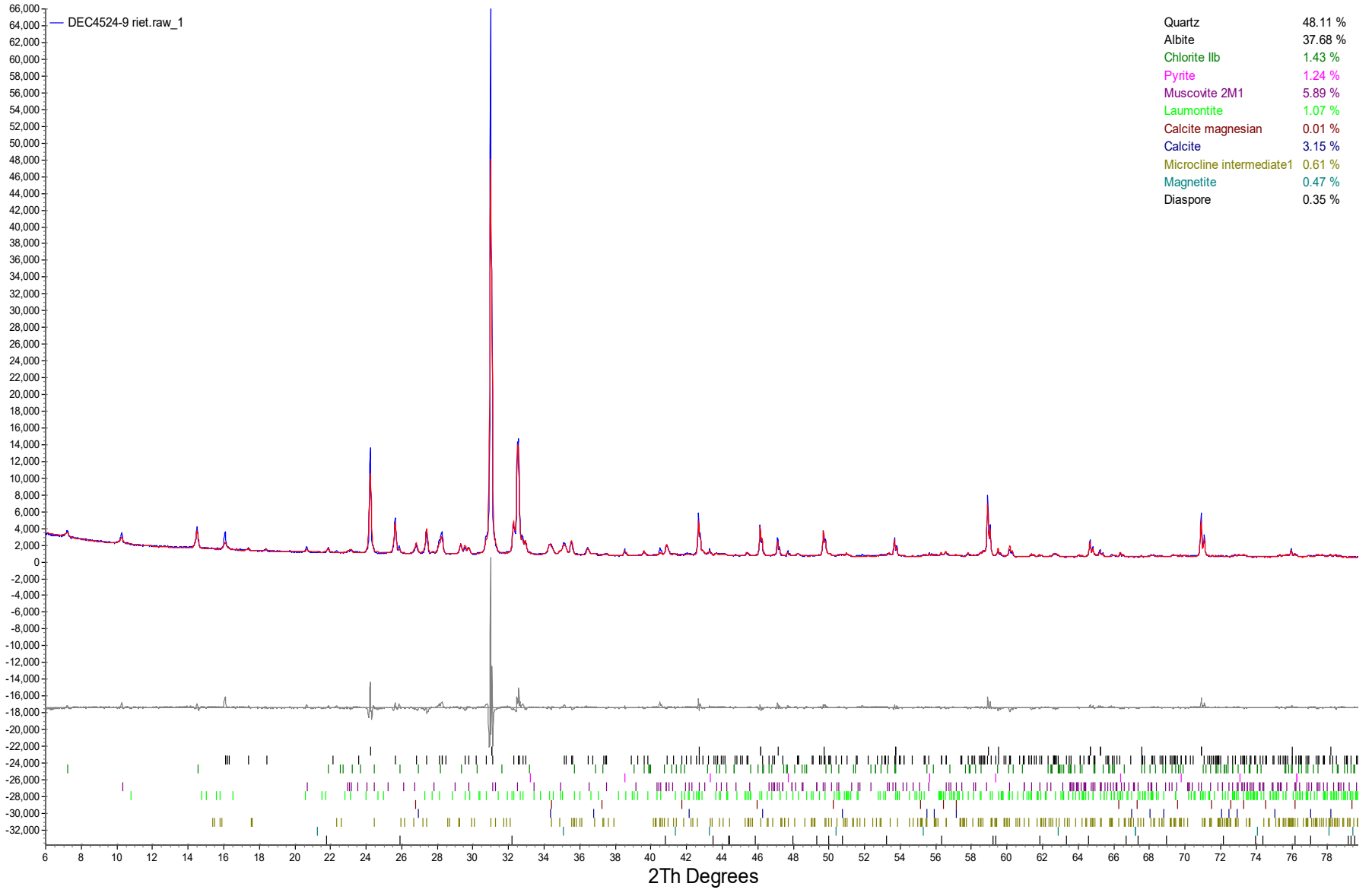
Quartz	45.51 %
Albite	39.80 %
Chlorite IIb	1.96 %
Pyrite	1.28 %
Muscovite 2M1	7.43 %
Laumontite	1.41 %
Calcite	0.83 %
Microcline intermediate1	0.47 %
Gibbsite	0.26 %
Calcite magnesian	1.04 %

B SED-High SFE - DUP



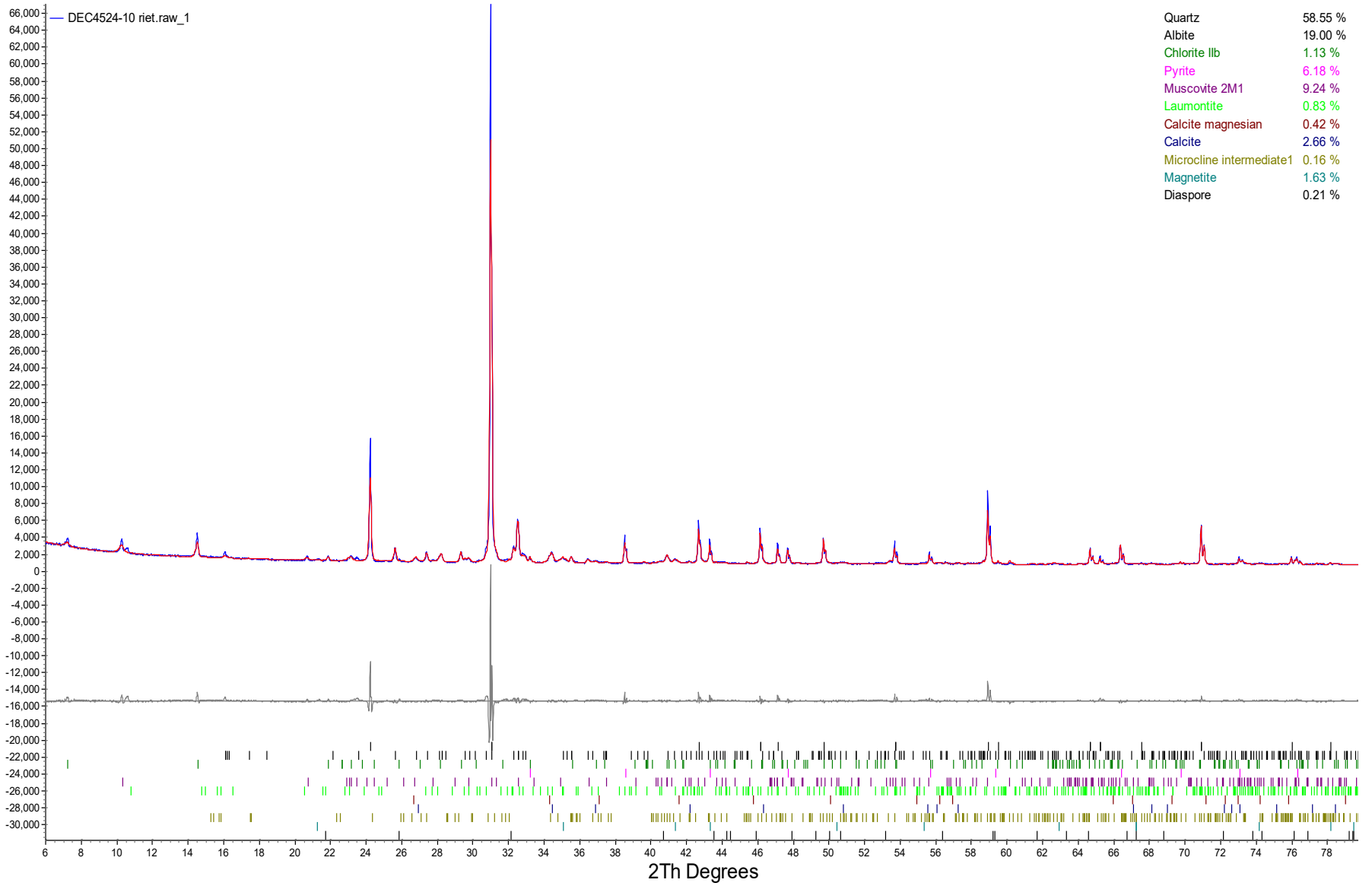
Quartz	51.39 %
Albite	13.84 %
Chlorite IIb	10.32 %
Pyrite	0.29 %
Muscovite 2M1	16.96 %
Laumontite	1.23 %
Calcite	3.68 %
Microcline intermediate1	1.03 %
Magnetite	1.26 %

B QTP-PAG - DUP



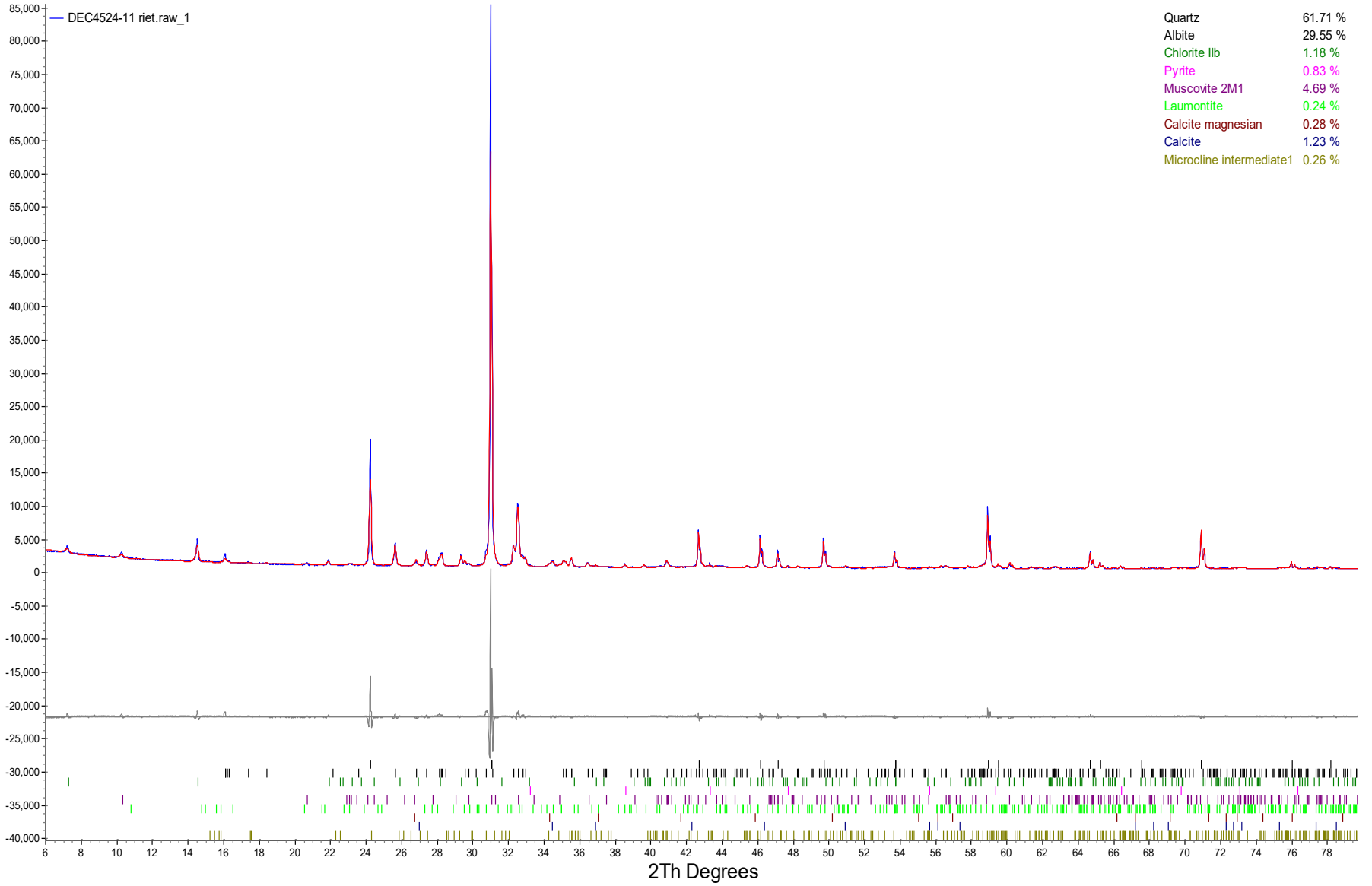
Quartz	48.11 %
Albite	37.68 %
Chlorite IIb	1.43 %
Pyrite	1.24 %
Muscovite 2M1	5.89 %
Laumontite	1.07 %
Calcite magnesian	0.01 %
Calcite	3.15 %
Microcline intermediate1	0.61 %
Magnetite	0.47 %
Diaspore	0.35 %

B LGO-PAG - DUP



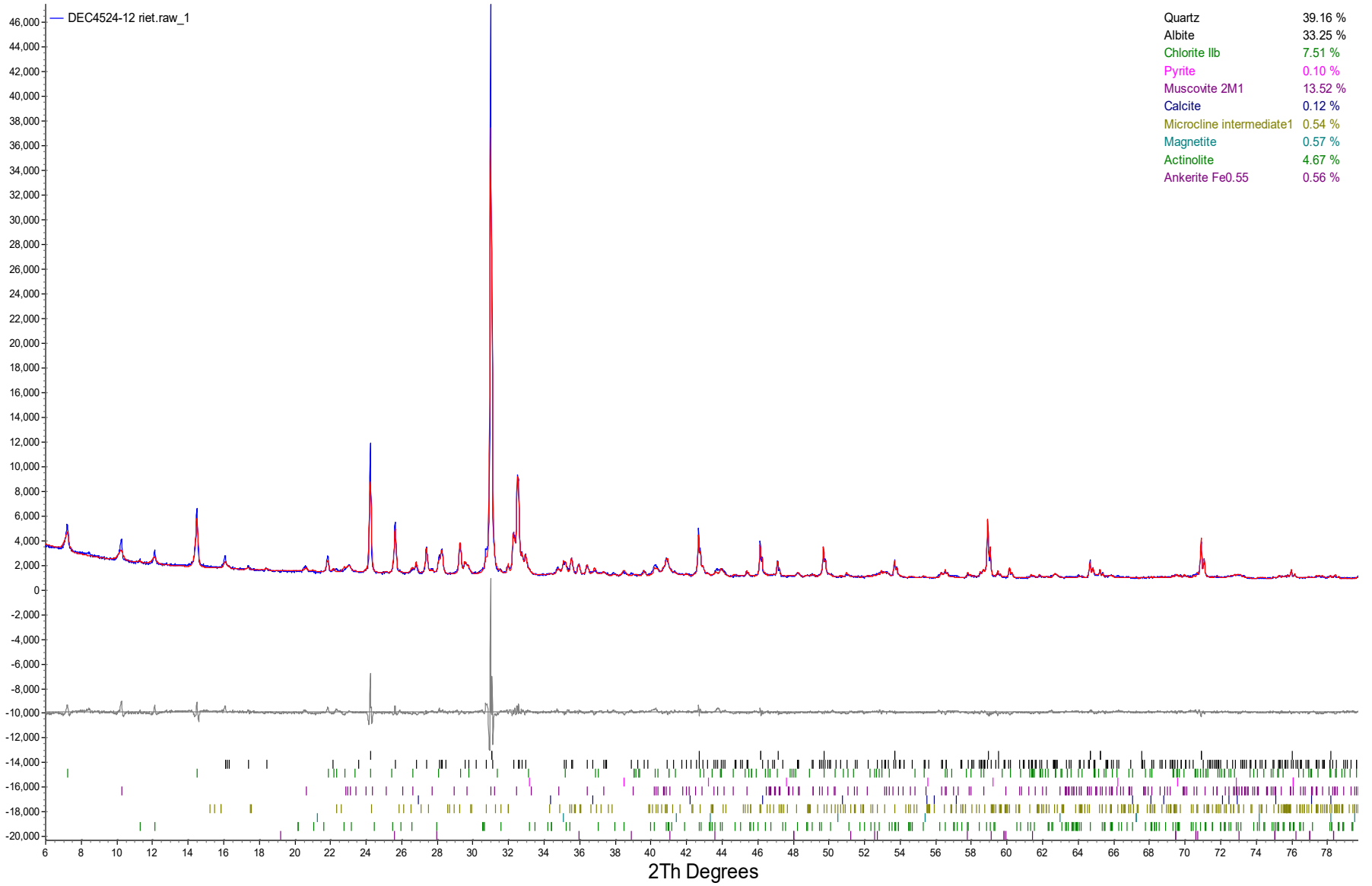
Quartz	58.55 %
Albite	19.00 %
Chlorite IIb	1.13 %
Pyrite	6.18 %
Muscovite 2M1	9.24 %
Laumontite	0.83 %
Calcite magnesian	0.42 %
Calcite	2.66 %
Microcline intermediate1	0.16 %
Magnetite	1.63 %
Diaspore	0.21 %

B HGO-PAG-Zn - DUP



Quartz	61.71 %
Albite	29.55 %
Chlorite IIb	1.18 %
Pyrite	0.83 %
Muscovite 2M1	4.69 %
Laumontite	0.24 %
Calcite magnesian	0.28 %
Calcite	1.23 %
Microcline intermediate1	0.26 %

B OB-ML - DUP



Quartz	39.16 %
Albite	33.25 %
Chlorite IIb	7.51 %
Pyrite	0.10 %
Muscovite 2M1	13.52 %
Calcite	0.12 %
Microcline intermediate1	0.54 %
Magnetite	0.57 %
Actinolite	4.67 %
Ankerite Fe0.55	0.56 %

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

20-January-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 08 December 2022
LR Report: **CA19107-DEC22**
Reference: Berry Composites- Set 3- As Rec'd

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Sample ID	Sample Date & Time	XRD-Rietveld
1: Analysis Start Date		20-Jan-23
2: Analysis Start Time		---
3: Analysis Completed Date		20-Jan-23
4: Analysis Completed Time		---
5: B-QPOR_FB	N/A	20-Jan-23
6: B-CG_FB	N/A	20-Jan-23
7: M-MD_FB	N/A	20-Jan-23
8: B-QTP_FB	N/A	20-Jan-23
9: B-LGO_FB	N/A	20-Jan-23
10: B-HGO_FB	N/A	20-Jan-23
11: B-QPOR_FB DUP	N/A	20-Jan-23
12: B-CG_FB DUP	N/A	20-Jan-23
13: M-MD_FB DUP	N/A	20-Jan-23
14: B-QTP_FB DUP	N/A	20-Jan-23
15: B-LGO_FB DUP	N/A	20-Jan-23
16: B-HGO_FB DUP	N/A	20-Jan-23

<original signed by>

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0003202782

Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for:	*Environmental Services*
Project Number/ LIMS No.	*Custom XRD/MI4518-JAN23*
Sample Receipt:	*January 10, 2023*
Sample Analysis:	*February 13, 2023*
Reporting Date:	*February 15, 2023*

Instrument:	BRUKER AXS D8 Advance Diffractometer
Test Conditions:	Co radiation, 35 kV, 40 mA; Detector: LYNXEYE Regular Scanning: Step: 0.02°, Step time: 0.75s, 2θ range: 6-80°
Interpretations :	PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva and Topas software.
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

<original signed by>

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

<original signed by>

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

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Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.05wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

Mineral/Compound	B QPOR JAN4518-01 (wt %)	B SED JAN4518-02 (wt %)	B MD JAN4518-03 (wt %)	B QTP JAN4518-04 (wt %)	B LGO JAN4518-05 (wt %)	B HGO JAN4518-06 (wt %)
Quartz	48.8	42.3	42.0	47.8	46.8	49.7
Albite	33.4	12.4	19.7	37.0	32.7	35.3
Chlorite	3.5	6.8	16.1	2.8	2.8	2.4
Pyrite	0.3	0.1	0.3	0.4	1.2	1.1
Muscovite	6.7	23.2	10.9	6.4	9.2	4.9
Microcline	2.7	1.2	2.1	1.5	1.7	2.0
Laumontite	1.2	1.3	-	0.7	-	0.5
Calcite magnesian	3.5	1.9	-	2.4	2.5	2.4
Calcite	-	3.2	5.7	1.1	2.8	1.8
Magnetite	-	2.3	1.0	-	0.4	-
Ankerite	-	3.9	0.6	-	-	-
Hematite	-	0.7	0.5	-	-	-
Rutile	-	0.7	0.9	-	-	-
TOTAL	100	100	100	100	100	100

Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

Mineral/Compound	Formula
Quartz	SiO_2
Albite	$NaAlSi_3O_8$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Pyrite	FeS_2
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Microcline	$KAlSi_3O_8$
Laumontite	$Ca(Al_2Si_4O_{12})\cdot 4H_2O$
Calcite magnesian	$(Ca,Mg)CO_3$
Calcite	$CaCO_3$
Magnetite	Fe_3O_4
Ankerite	$CaFe(CO_3)_2$
Hematite	Fe_2O_3
Rutile	TiO_2

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

Mineral/Compound	B QPOR dup JAN4518-07 (wt %)	B SED dup JAN4518-08 (wt %)	B MD dup JAN4518-09 (wt %)	B QTP dup JAN4518-10 (wt %)	B LGO dup JAN4518-11 (wt %)	B HGO dup JAN4518-12 (wt %)
Quartz	49.9	41.4	43.6	50.0	45.9	48.8
Albite	33.2	12.6	18.0	35.7	34.4	36.1
Chlorite	3.3	7.0	15.4	2.5	2.9	2.5
Pyrite	0.3	0.2	0.3	0.3	1.1	1.1
Muscovite	6.9	23.2	11.9	6.2	8.6	5.2
Microcline	2.5	1.0	1.9	1.4	1.2	1.4
Laumontite	1.2	1.1	-	0.6	-	1.0
Calcite magnesian	2.6	2.6	-	2.4	2.5	2.0
Calcite	-	3.3	5.9	1.0	3.0	1.8
Magnetite	-	2.3	1.2	-	0.3	-
Ankerite	-	4.0	0.3	-	-	-
Hematite	-	0.6	0.4	-	-	-
Rutile	-	0.7	1.1	-	-	-
TOTAL	100	100	100	100	100	100

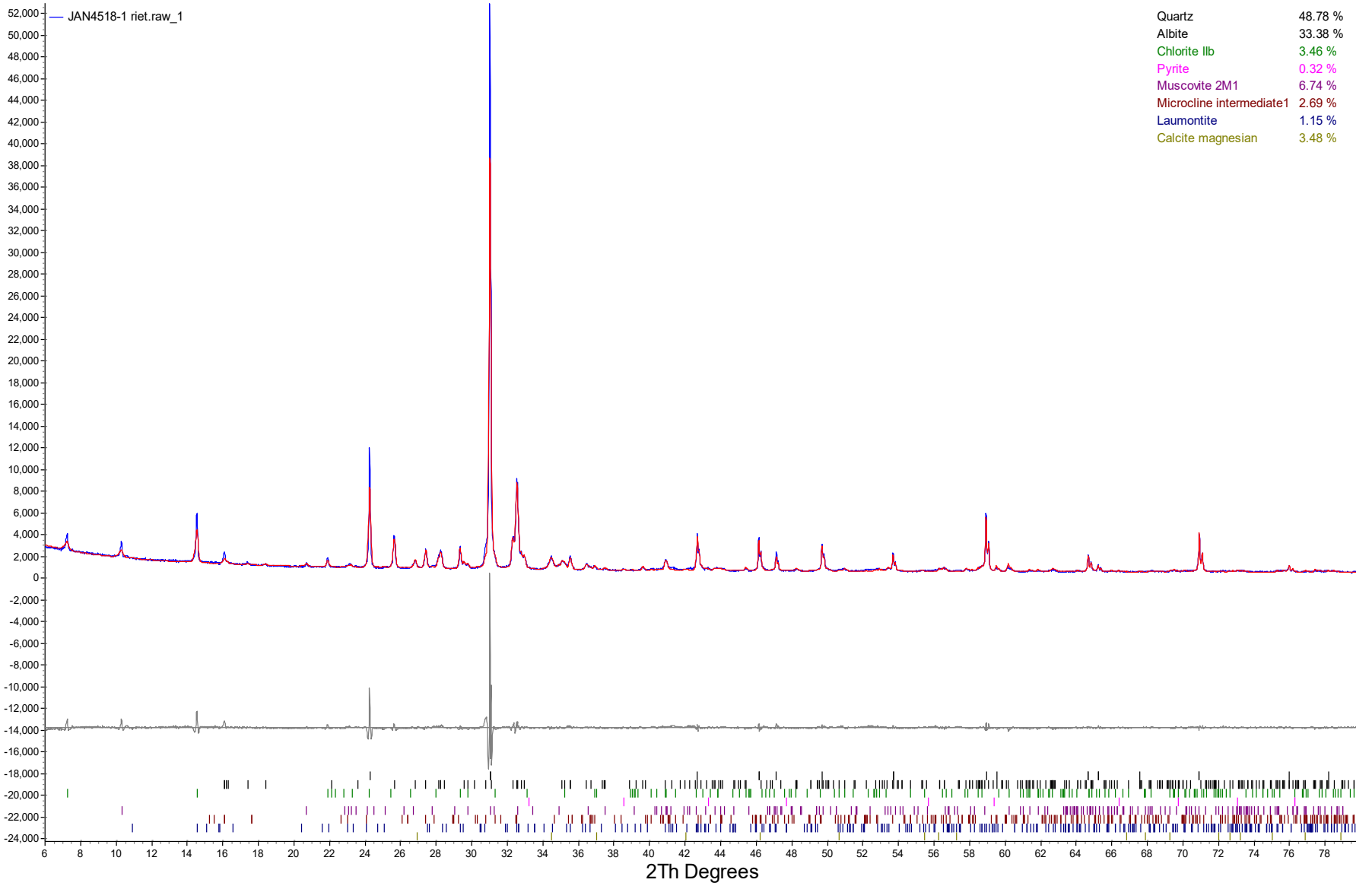
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

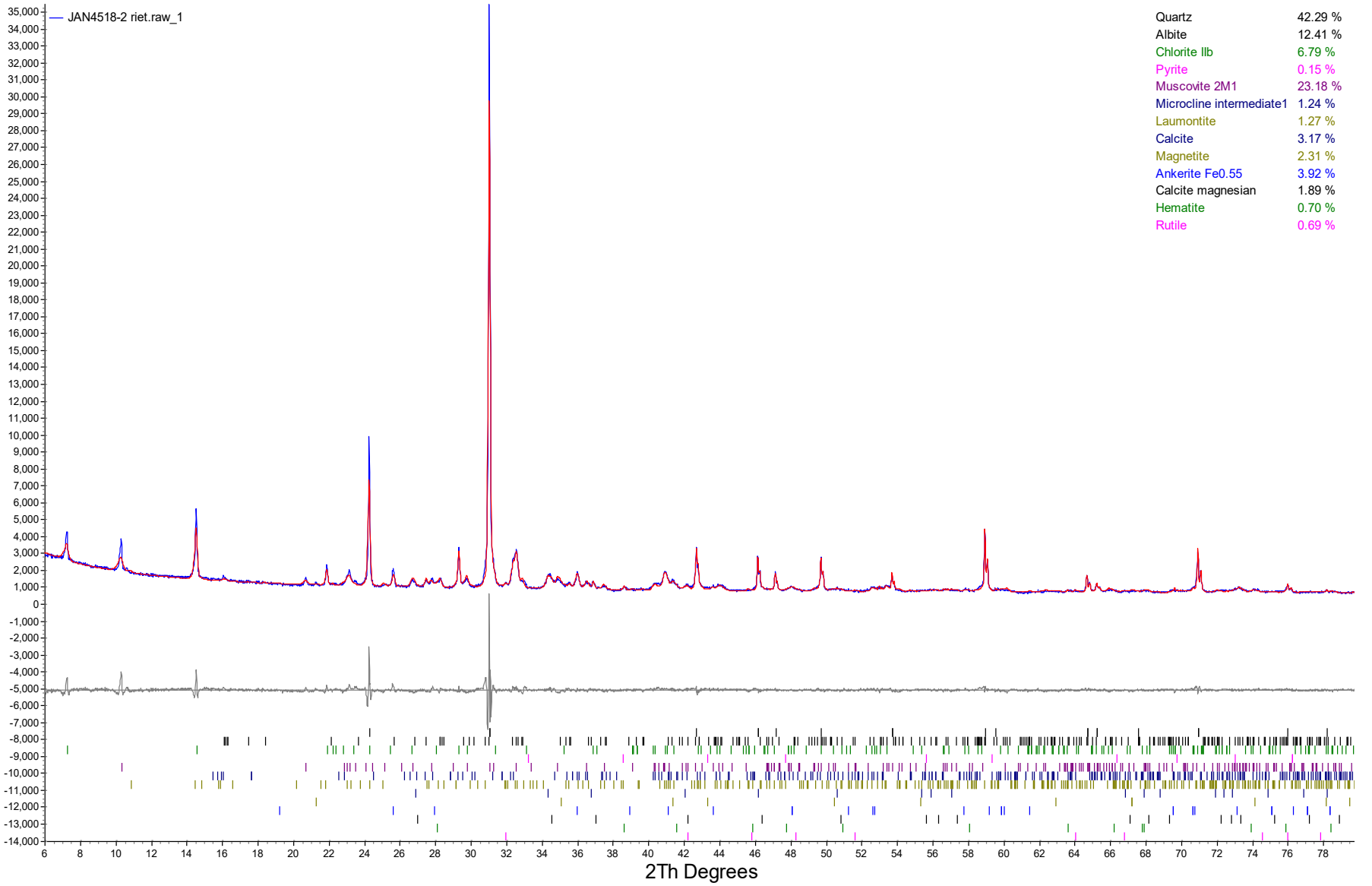
Mineral/Compound	Formula
Quartz	SiO_2
Albite	$NaAlSi_3O_8$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Pyrite	FeS_2
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Microcline	$KAlSi_3O_8$
Laumontite	$Ca(Al_2Si_4O_{12})\cdot 4H_2O$
Calcite magnesian	$(Ca,Mg)CO_3$
Calcite	$CaCO_3$
Magnetite	Fe_3O_4
Ankerite	$CaFe(CO_3)_2$
Hematite	Fe_2O_3
Rutile	TiO_2

B QPOR



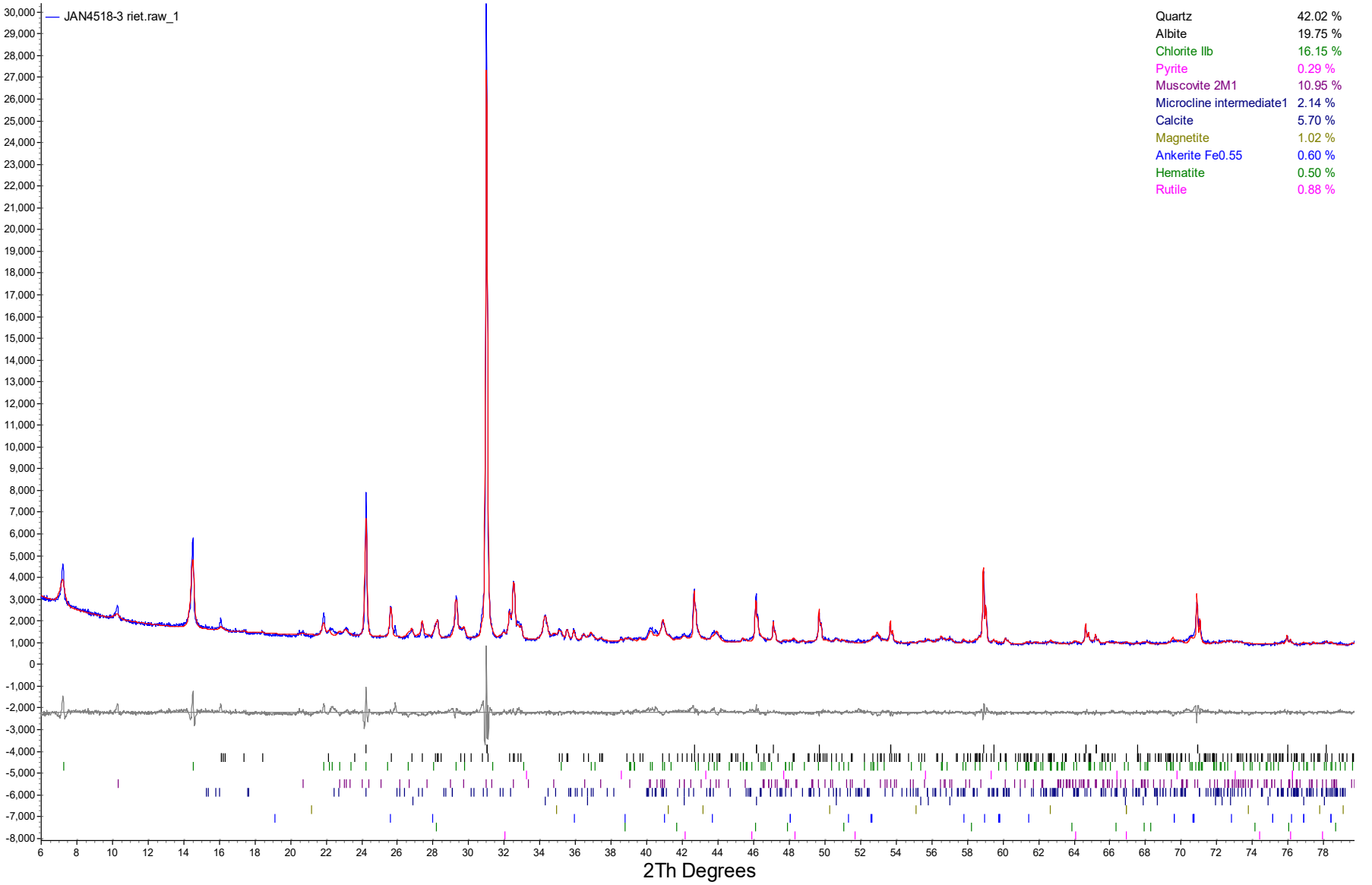
Quartz	48.78 %
Albite	33.38 %
Chlorite IIb	3.46 %
Pyrite	0.32 %
Muscovite 2M1	6.74 %
Microcline intermediate1	2.69 %
Laumontite	1.15 %
Calcite magnesian	3.48 %

B SED



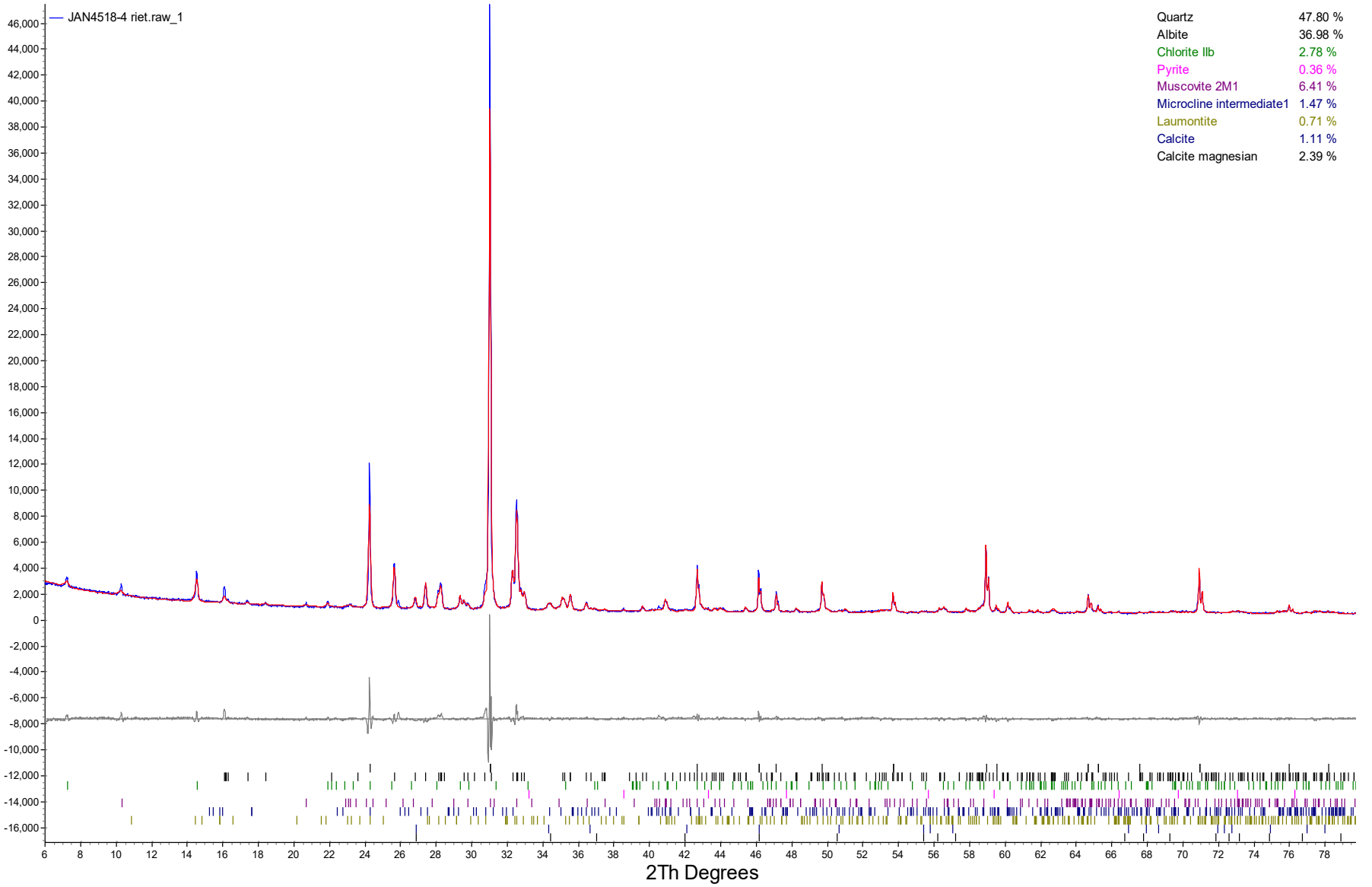
Quartz	42.29 %
Albite	12.41 %
Chlorite IIb	6.79 %
Pyrite	0.15 %
Muscovite 2M1	23.18 %
Microcline intermediate1	1.24 %
Laumontite	1.27 %
Calcite	3.17 %
Magnetite	2.31 %
Ankerite Fe0.55	3.92 %
Calcite magnesian	1.89 %
Hematite	0.70 %
Rutile	0.69 %

B MD



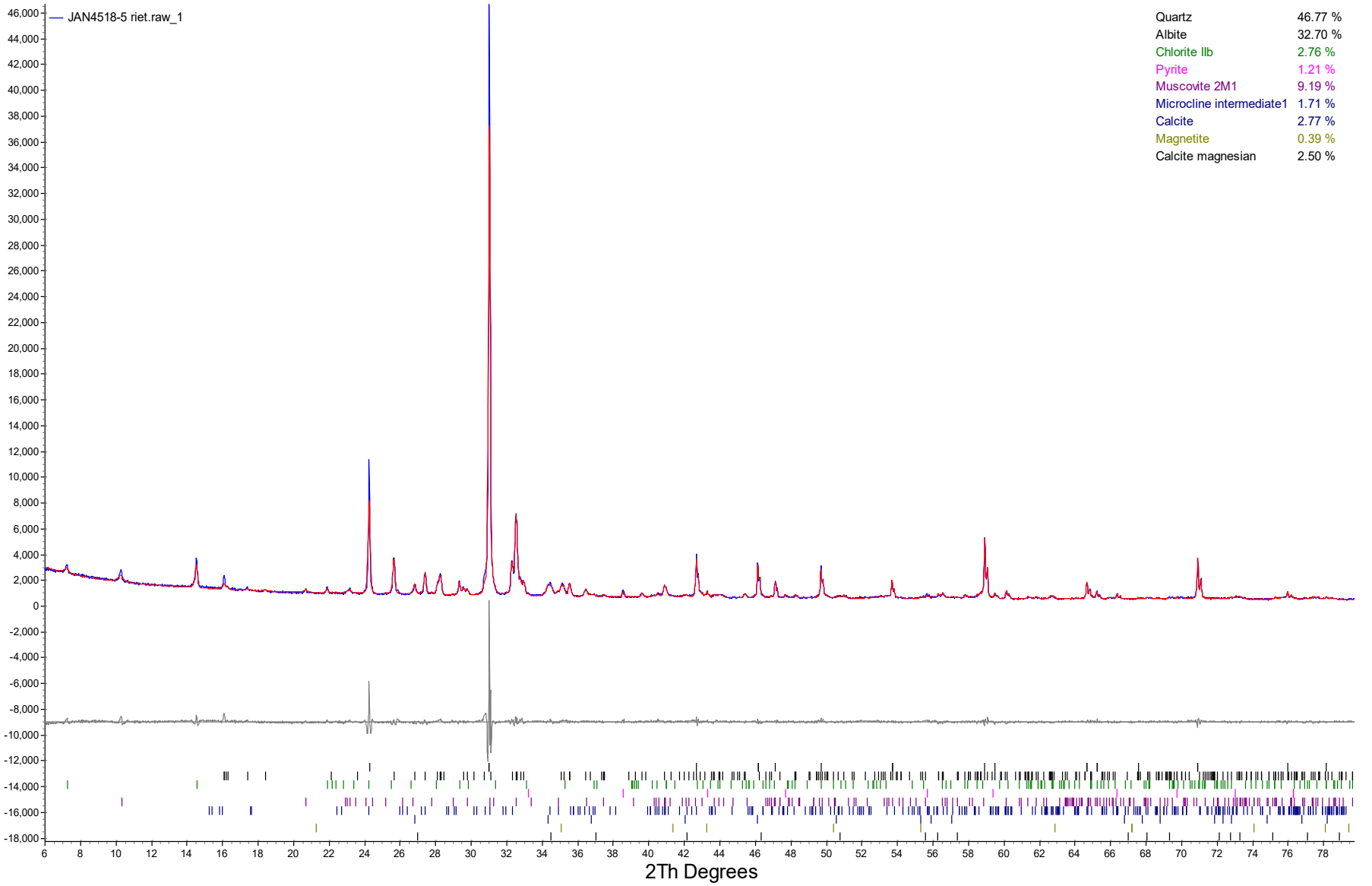
Quartz	42.02 %
Albite	19.75 %
Chlorite IIb	16.15 %
Pyrite	0.29 %
Muscovite 2M1	10.95 %
Microcline intermediate1	2.14 %
Calcite	5.70 %
Magnetite	1.02 %
Ankerite Fe0.55	0.60 %
Hematite	0.50 %
Rutile	0.88 %

B QTP



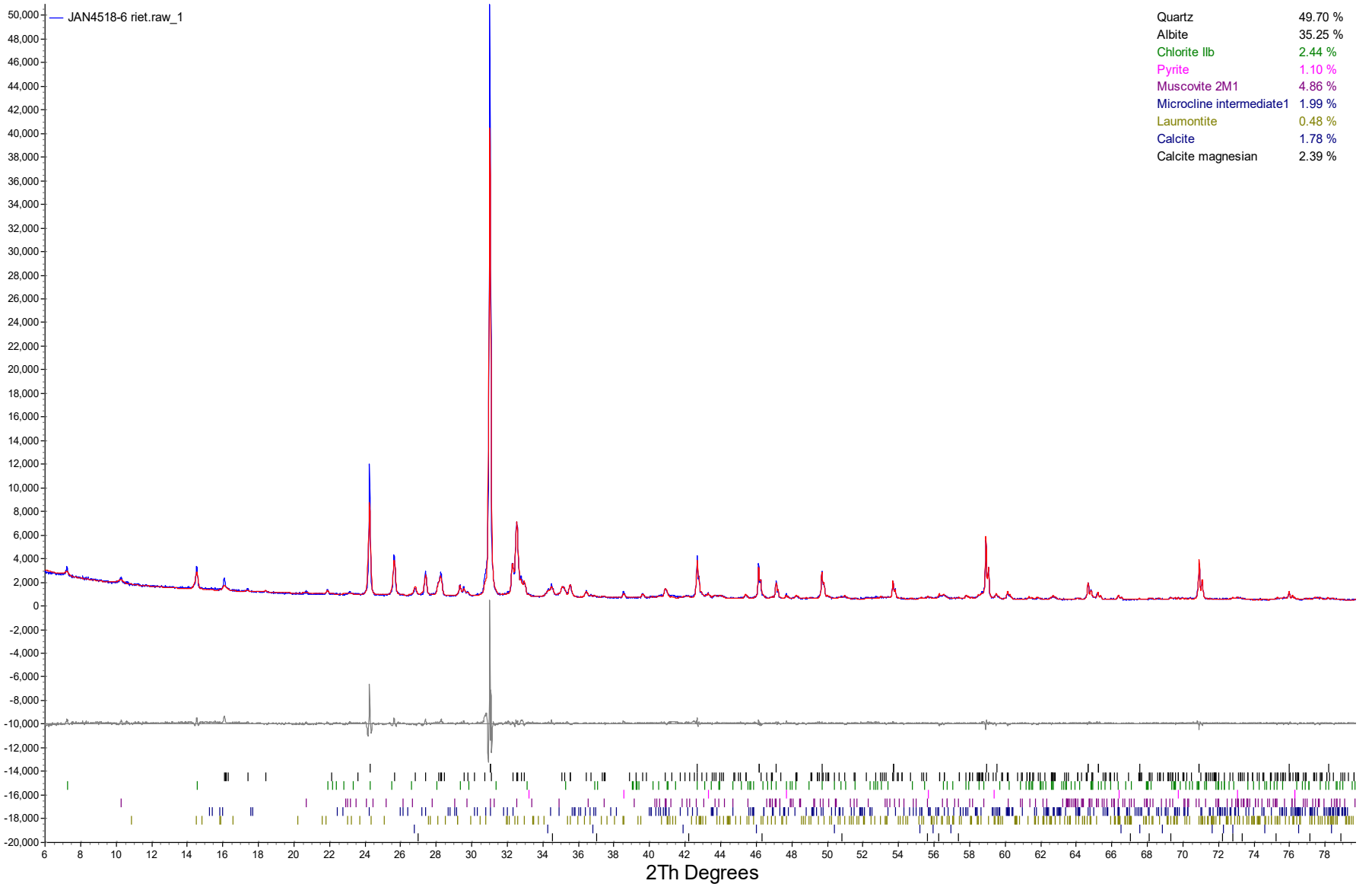
Quartz	47.80 %
Albite	36.98 %
Chlorite IIb	2.78 %
Pyrite	0.36 %
Muscovite 2M1	6.41 %
Microcline intermediate1	1.47 %
Laumontite	0.71 %
Calcite	1.11 %
Calcite magnesian	2.39 %

B LGO



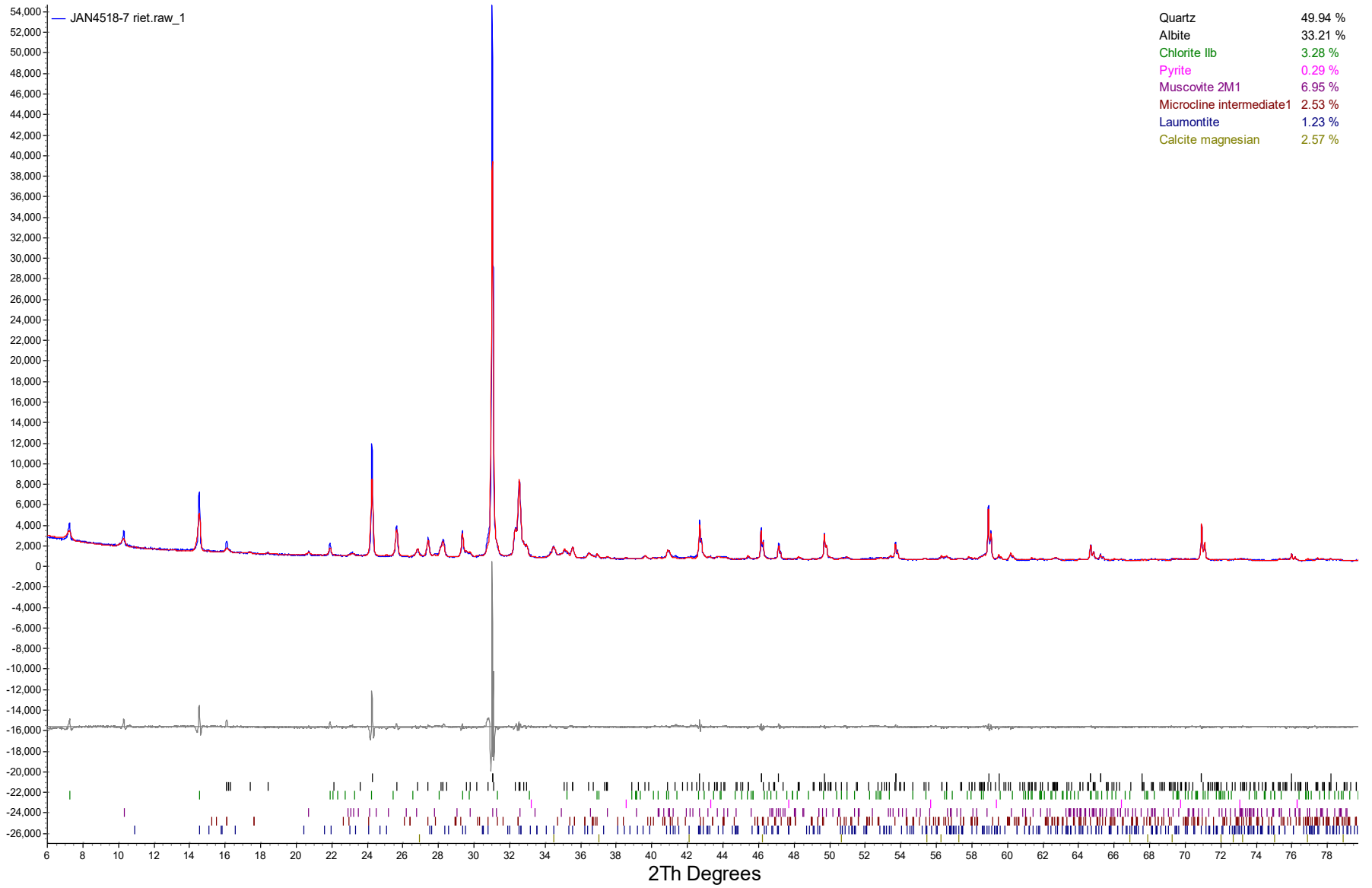
Quartz	46.77 %
Albite	32.70 %
Chlorite IIb	2.76 %
Pyrite	1.21 %
Muscovite 2M1	9.19 %
Microcline intermediate1	1.71 %
Calcite	2.77 %
Magnetite	0.39 %
Calcite magnesian	2.50 %

B HGO



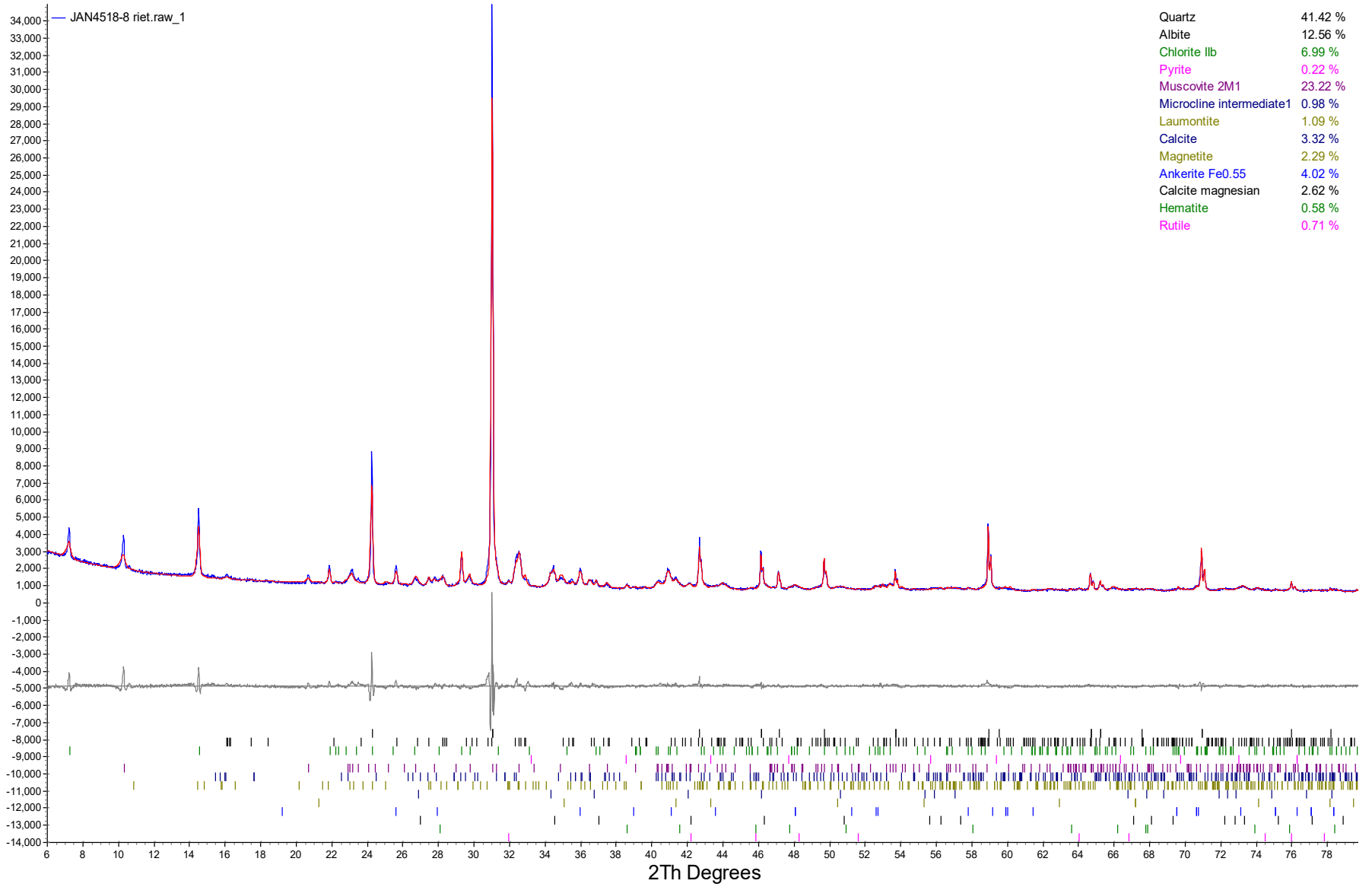
Quartz	49.70 %
Albite	35.25 %
Chlorite IIb	2.44 %
Pyrite	1.10 %
Muscovite 2M1	4.86 %
Microcline intermediate1	1.99 %
Laumontite	0.48 %
Calcite	1.78 %
Calcite magnesian	2.39 %

B QPOR Dup



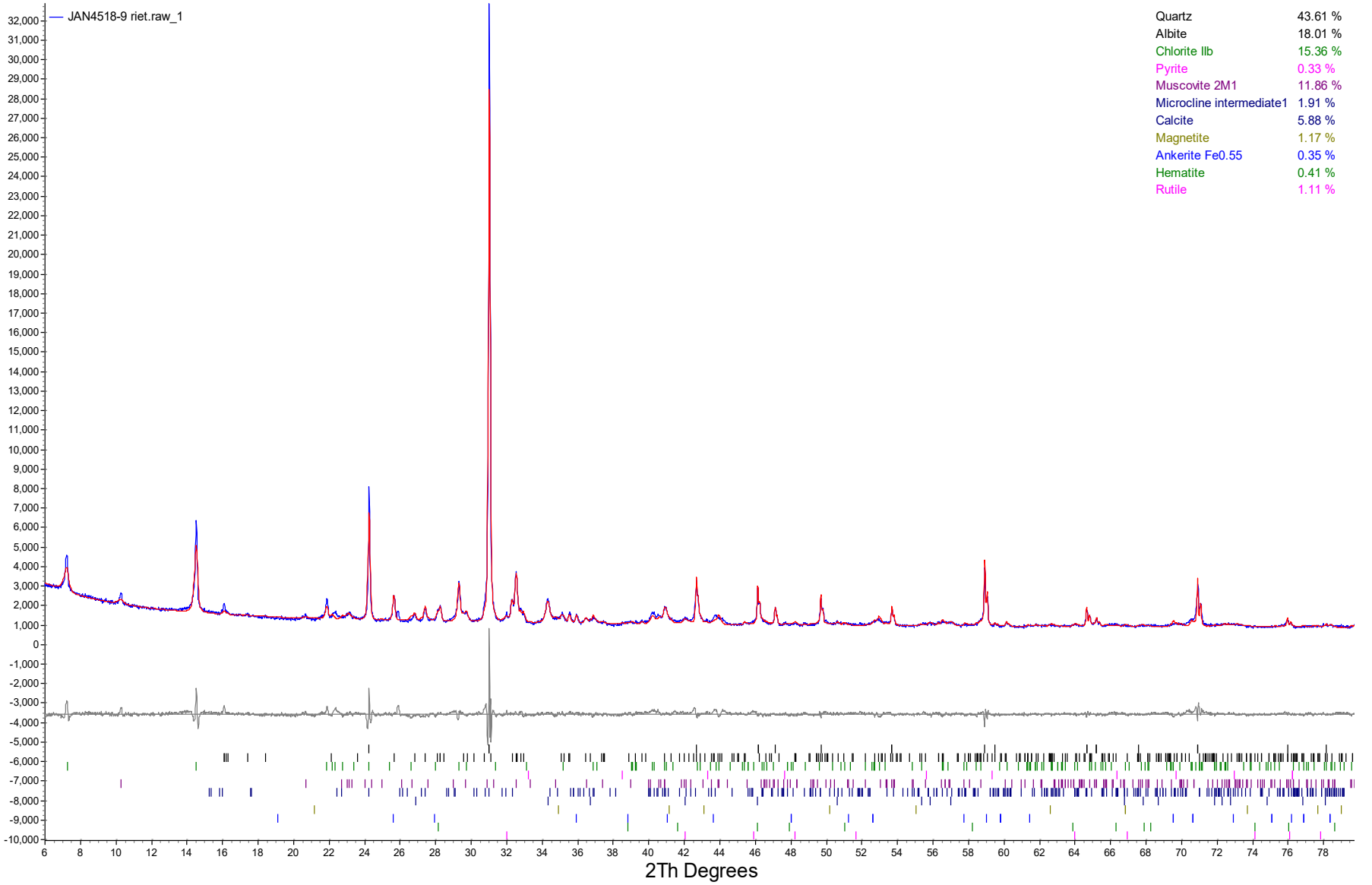
Quartz	49.94 %
Albite	33.21 %
Chlorite IIb	3.28 %
Pyrite	0.29 %
Muscovite 2M1	6.95 %
Microcline intermediate1	2.53 %
Laumontite	1.23 %
Calcite magnesian	2.57 %

B SED Dup



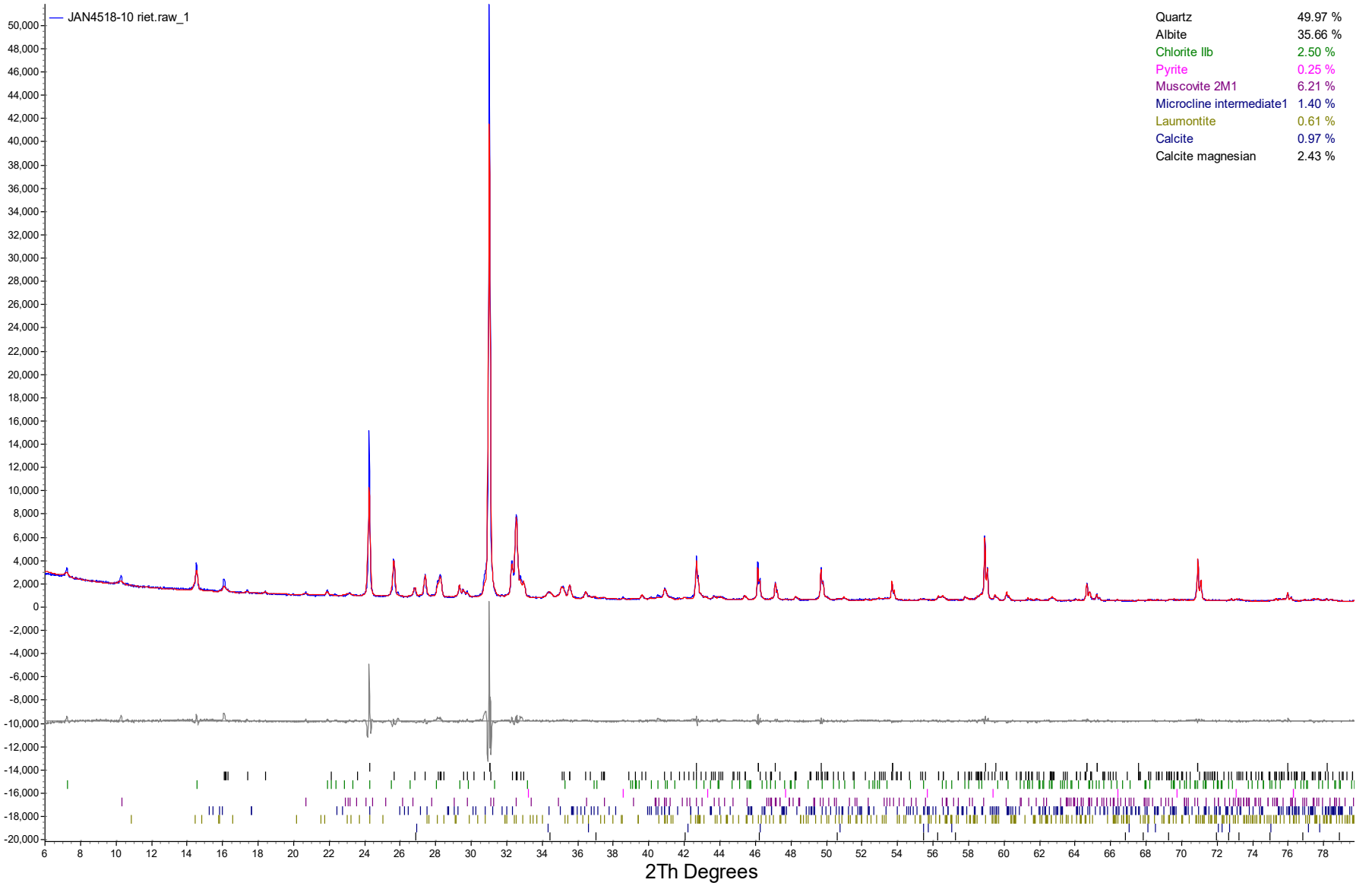
Quartz	41.42 %
Albite	12.56 %
Chlorite IIb	6.99 %
Pyrite	0.22 %
Muscovite 2M1	23.22 %
Microcline intermediate1	0.98 %
Laumontite	1.09 %
Calcite	3.32 %
Magnetite	2.29 %
Ankerite Fe0.55	4.02 %
Calcite magnesian	2.62 %
Hematite	0.58 %
Rutile	0.71 %

B MD Dup



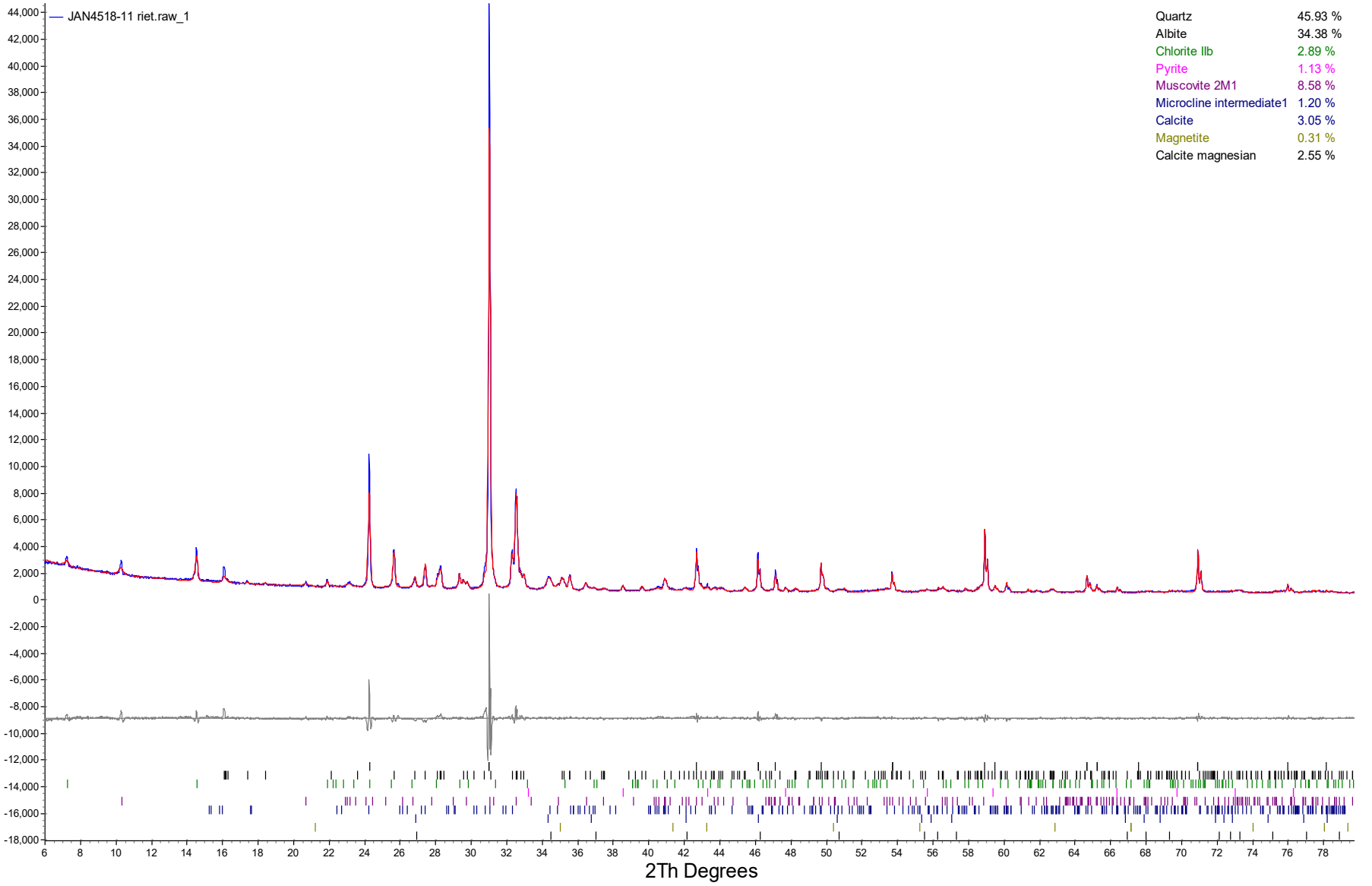
Quartz	43.61 %
Albite	18.01 %
Chlorite IIb	15.36 %
Pyrite	0.33 %
Muscovite 2M1	11.86 %
Microcline intermediate1	1.91 %
Calcite	5.88 %
Magnetite	1.17 %
Ankerite Fe0.55	0.35 %
Hematite	0.41 %
Rutile	1.11 %

B QTP Dup



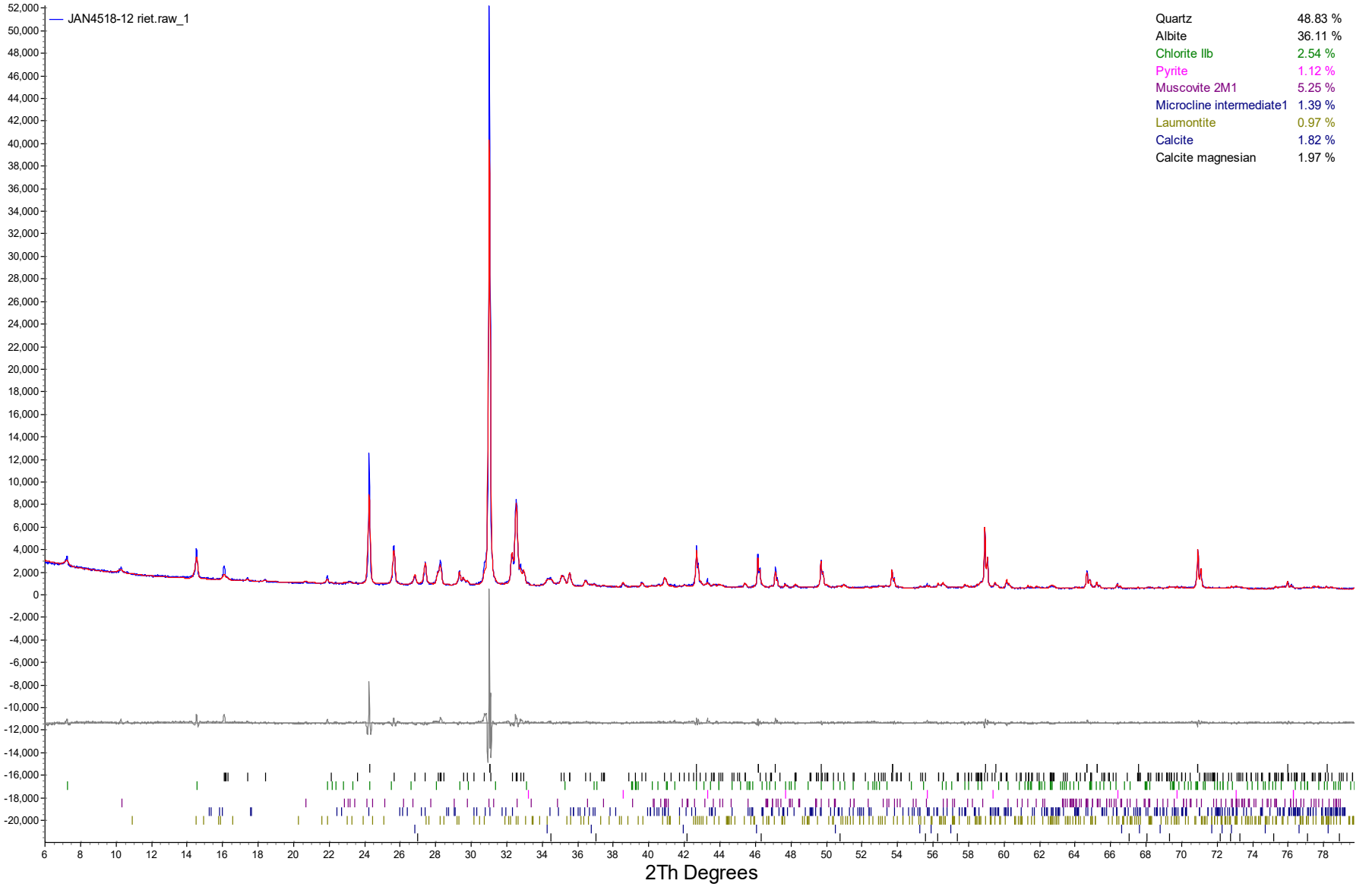
Quartz	49.97 %
Albite	35.66 %
Chlorite IIb	2.50 %
Pyrite	0.25 %
Muscovite 2M1	6.21 %
Microcline intermediate1	1.40 %
Laumontite	0.61 %
Calcite	0.97 %
Calcite magnesian	2.43 %

B LGO Dup



Quartz	45.93 %
Albite	34.38 %
Chlorite IIb	2.89 %
Pyrite	1.13 %
Muscovite 2M1	8.58 %
Microcline intermediate1	1.20 %
Calcite	3.05 %
Magnetite	0.31 %
Calcite magnesian	2.55 %

B HGO Dup



Quartz	48.83 %
Albite	36.11 %
Chlorite IIb	2.54 %
Pyrite	1.12 %
Muscovite 2M1	5.25 %
Microcline intermediate1	1.39 %
Laumontite	0.97 %
Calcite	1.82 %
Calcite magnesian	1.97 %

Quantitative X-Ray Diffraction by Rietveld Refinement

Report Prepared for:	*Environmental Services*
Project Number/ LIMS No.	*Custom XRD/MI4550-JAN23*
Sample Receipt:	*January 30, 2023*
Sample Analysis:	*February 13, 2023*
Reporting Date:	*April 14, 2023*

Instrument:	BRUKER AXS D8 Advance Diffractometer
Test Conditions:	Co radiation, 35 kV, 40 mA; Detector: LYNXEYE Regular Scanning: Step: 0.02°, Step time: 0.75s, 2θ range: 6-80°
Interpretations :	PDF2/PDF4 powder diffraction databases issued by the International Center for Diffraction Data (ICDD). DiffracPlus Eva and Topas software.
Detection Limit :	0.5-2%. Strongly dependent on crystallinity.

Contents:

<original signed by>

Kim Gibbs, H.B.Sc., P.Geo.
Senior Mineralogist

<original signed by>

Huyun Zhou, Ph.D., P.Geo.
Senior Mineralogist

ACCREDITATION: SGS Natural Resources Lakefield is accredited to the requirements of ISO/IEC 17025 for specific tests as listed on our scope of accreditation, including geochemical, mineralogical and trade mineral tests. To view a list of the accredited methods, please visit the following website and search SGS Canada Inc. - Minerals: https://www.scc.ca/en/search/palcan.

Method Summary

The Rietveld Method of Mineral Identification by XRD (ME-LR-MIN-MET-MN-D05) method used by SGS Natural Resources is accredited to the requirements of ISO/IEC 17025.

Mineral Identification and Interpretation:

Mineral identification and interpretation involves matching the diffraction pattern of an unknown material to patterns of single-phase reference materials. The reference patterns are compiled by the Joint Committee on Powder Diffraction Standards - International Center for Diffraction Data (JCPDS-ICDD) database and released on software as Powder Diffraction Files (PDF).

Interpretations do not reflect the presence of non-crystalline and/or amorphous compounds, except when internal standards have been added by request. Mineral proportions may be strongly influenced by crystallinity, crystal structure and preferred orientations. Mineral or compound identification and quantitative analysis results should be accompanied by supporting chemical assay data or other additional tests.

Quantitative Rietveld Analysis:

Quantitative Rietveld Analysis is performed by using Topas 4.2 (Bruker AXS), a graphics based profile analysis program built around a non-linear least squares fitting system, to determine the amount of different phases present in a multicomponent sample. Whole pattern analyses are predicated by the fact that the X-ray diffraction pattern is a total sum of both instrumental and specimen factors. Unlike other peak intensity-based methods, the Rietveld method uses a least squares approach to refine a theoretical line profile until it matches the obtained experimental patterns.

Rietveld refinement is completed with a set of minerals specifically identified for the sample. Zero values indicate that the mineral was included in the refinement calculations, but the calculated concentration was less than 0.05wt%. Minerals not identified by the analyst are not included in refinement calculations for specific samples and are indicated with a dash.

Summary of Rietveld Quantitative Analysis X-Ray Diffraction Results

Mineral/Compound	B QPOR-PAG-CO3DP (wt %)	B QTP-PAG-C03DP (wt %)	B LGO-PAG-CO3DP (wt %)	B HGO-PAG-Zn-CO3DP (wt %)	B QPOR-PAG-CO3DP Duplicate (wt %)	B QTP-PAG-C03DP Duplicate (wt %)	B LGO-PAG-CO3DP Duplicate (wt %)	B HGO-PAG-Zn-CO3DP Duplicate (wt %)
Quartz	50.17	43.11	60.46	61.05	50.05	44.18	59.88	61.71
Albite	38.13	44.28	19.53	28.98	38.69	43.16	19.92	28.29
Orthoclase	0.86	0.48	0.83	0.45	0.65	0.68	0.76	0.57
Chlorite	0.16	0.48	0.55	0.60	0.46	0.49	0.47	0.64
Muscovite	5.97	8.30	8.91	6.61	6.39	8.23	9.18	6.51
Paragonite	0.65	0.91	1.57	0.51	0.53	0.82	1.45	0.53
Tourmaline	2.16	0.25	0.22	0.27	1.46	0.23	0.31	0.26
Pyrite	1.29	1.38	6.45	1.21	1.22	1.31	6.49	1.16
Calcite	0.09	0.05	0.09	0.12	0.16	0.09	0.07	0.17
Magnetite	0.53	0.56	1.38	0.20	0.39	0.61	1.46	0.18
Stilpnomelane	-	0.20	-	-	-	0.22	-	-
TOTAL	100	100	100	100	100	100	100	100

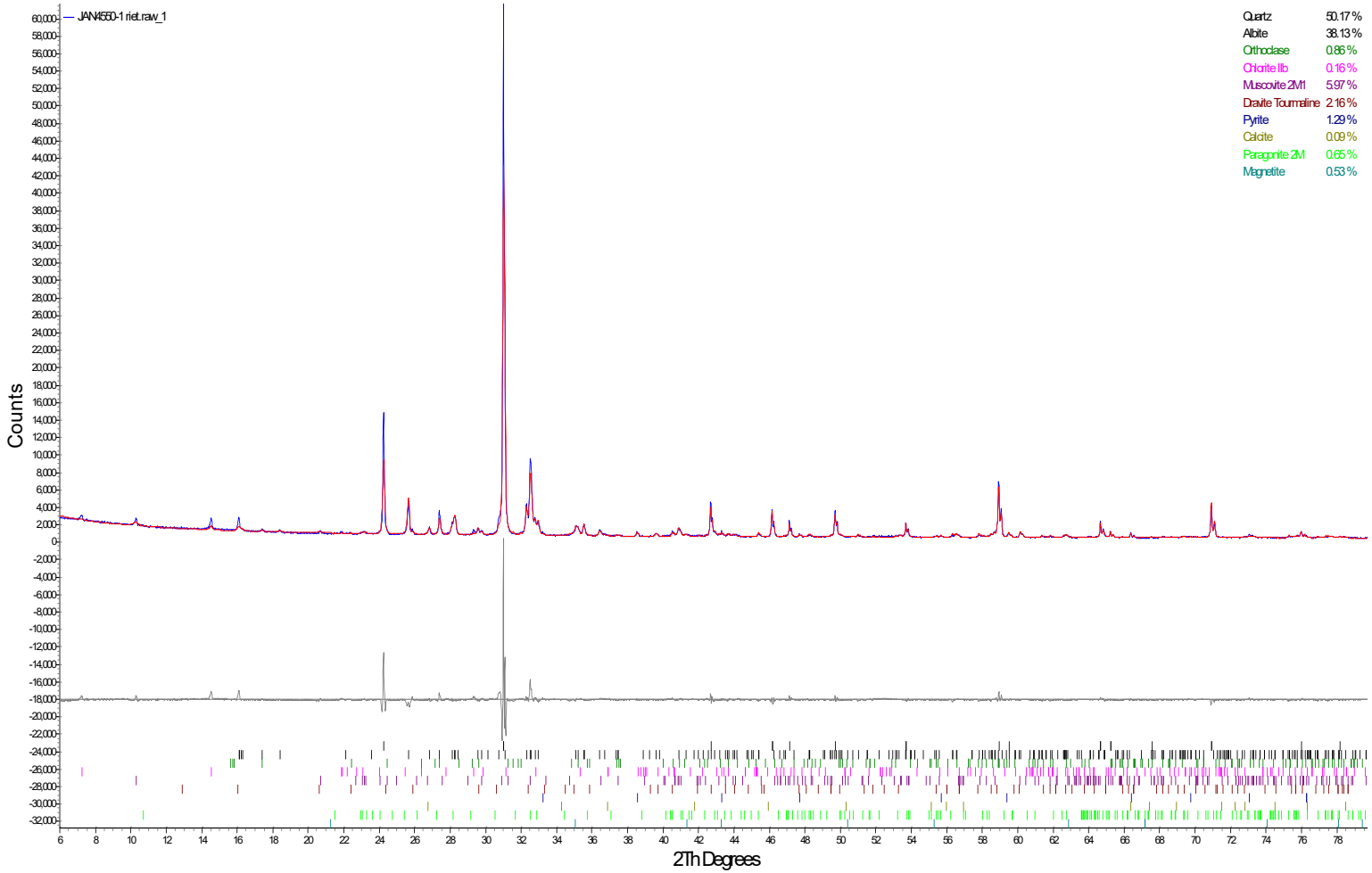
Zero values indicate that the mineral was included in the refinement, but the calculated concentration is below a measurable value.

Dashes indicate that the mineral was not identified by the analyst and not included in the refinement calculation for the sample.

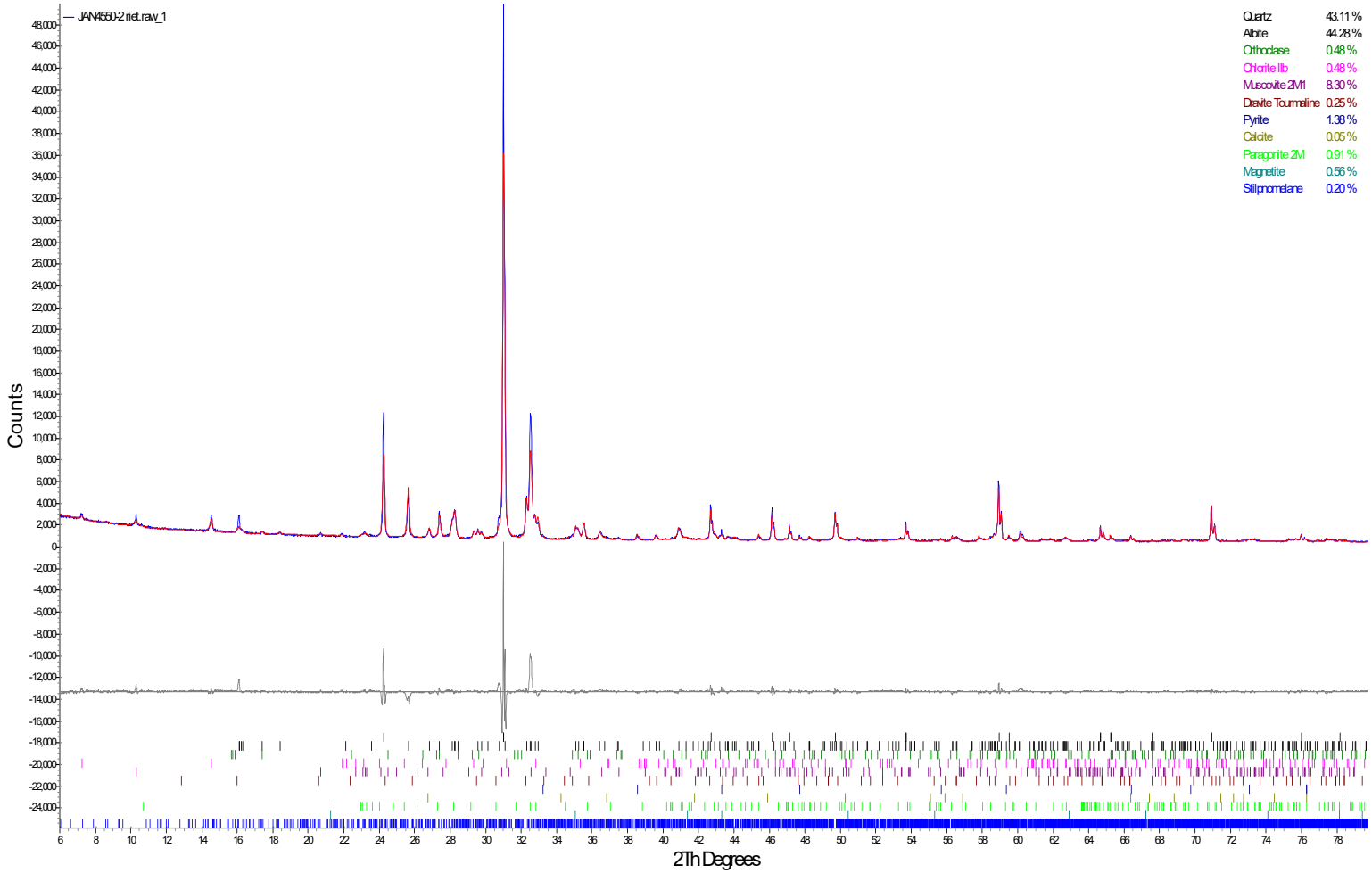
The weight percent quantities indicated have been normalized to a sum of 100%. The quantity of amorphous material has not been determined.

Mineral/Compound	Formula
Quartz	SiO_2
Albite	$NaAlSi_3O_8$
Orthoclase	$KAlSi_3O_8$
Chlorite	$(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$
Paragonite	$NaAl_2(AlSi_3O_{10})(OH)_2$
Tourmaline	$(Na,Ca)(Li,Mg,Al)(Al,Fe,Mn)_6(BO_3)_3(Si_6O_{18})(OH)_4$
Pyrite	FeS_2
Calcite	$CaCO_3$
Magnetite	Fe_3O_4
Stilpnomelane	$K(Fe^{2+},Mg,Fe^{3+})_8(Si,Al)_{12}(O,OH)_{27}\cdot nH_2O$

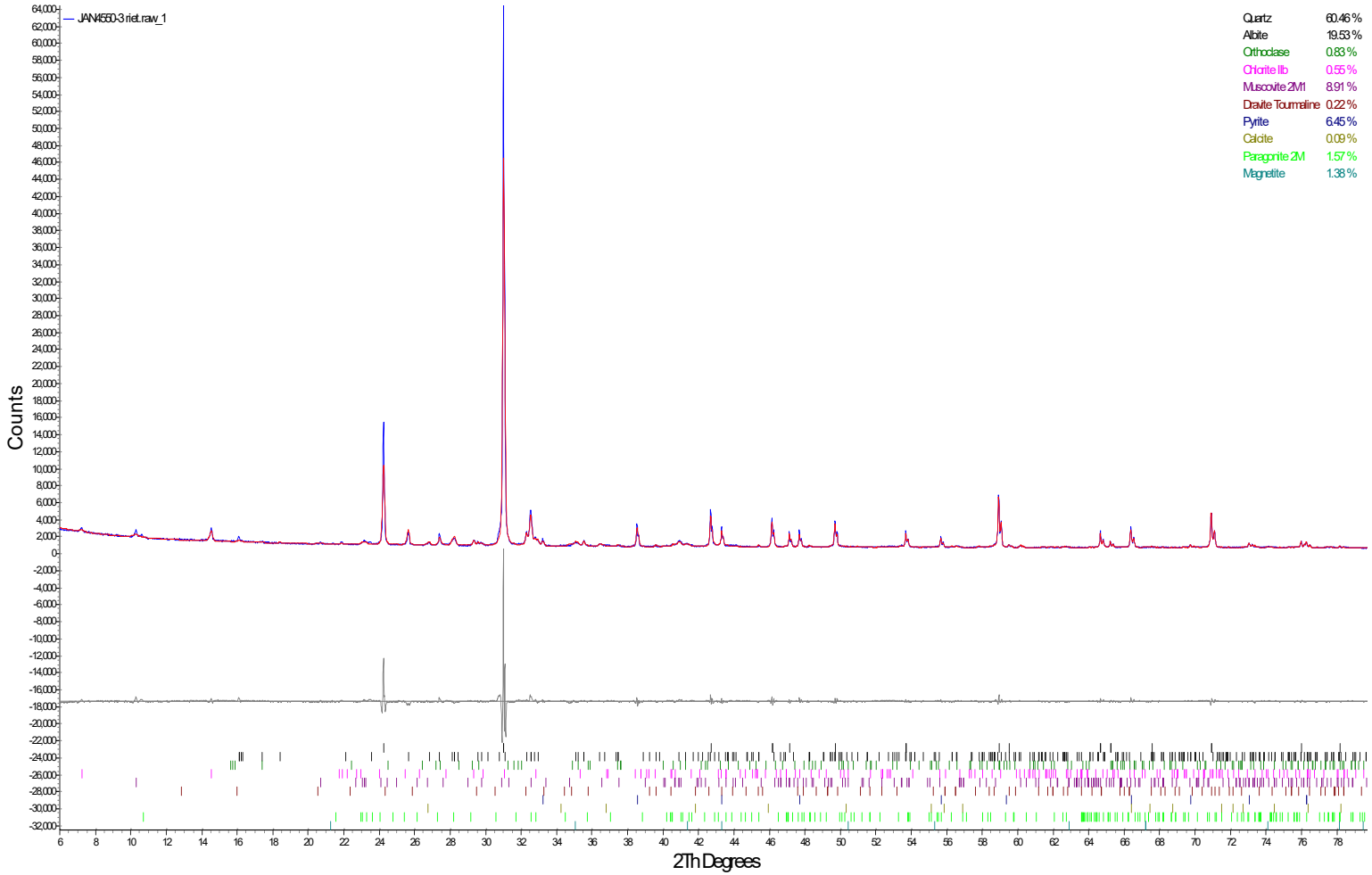
BQPOR-PAG-CC8DP



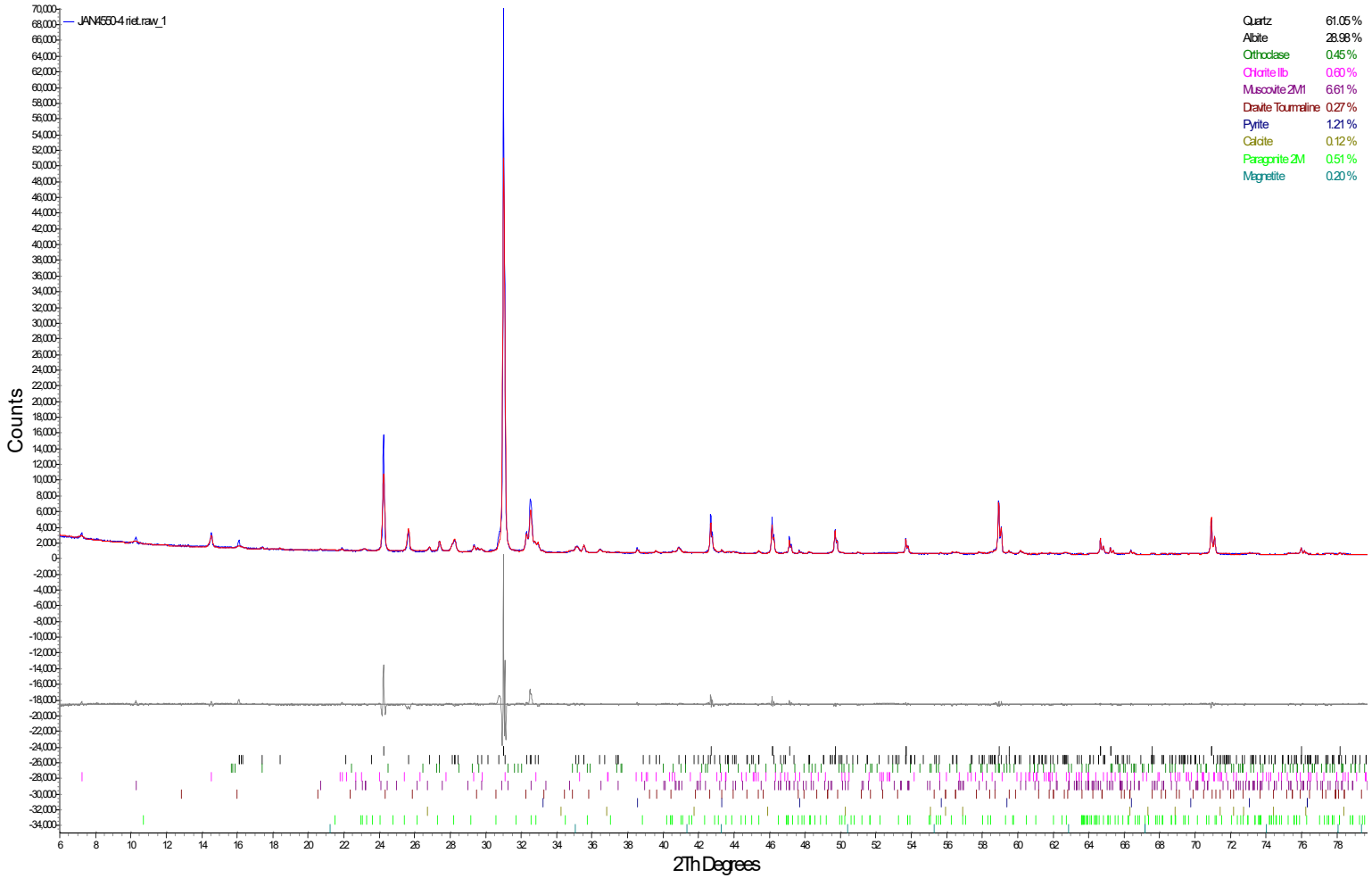
BQTP-PAG-003DP

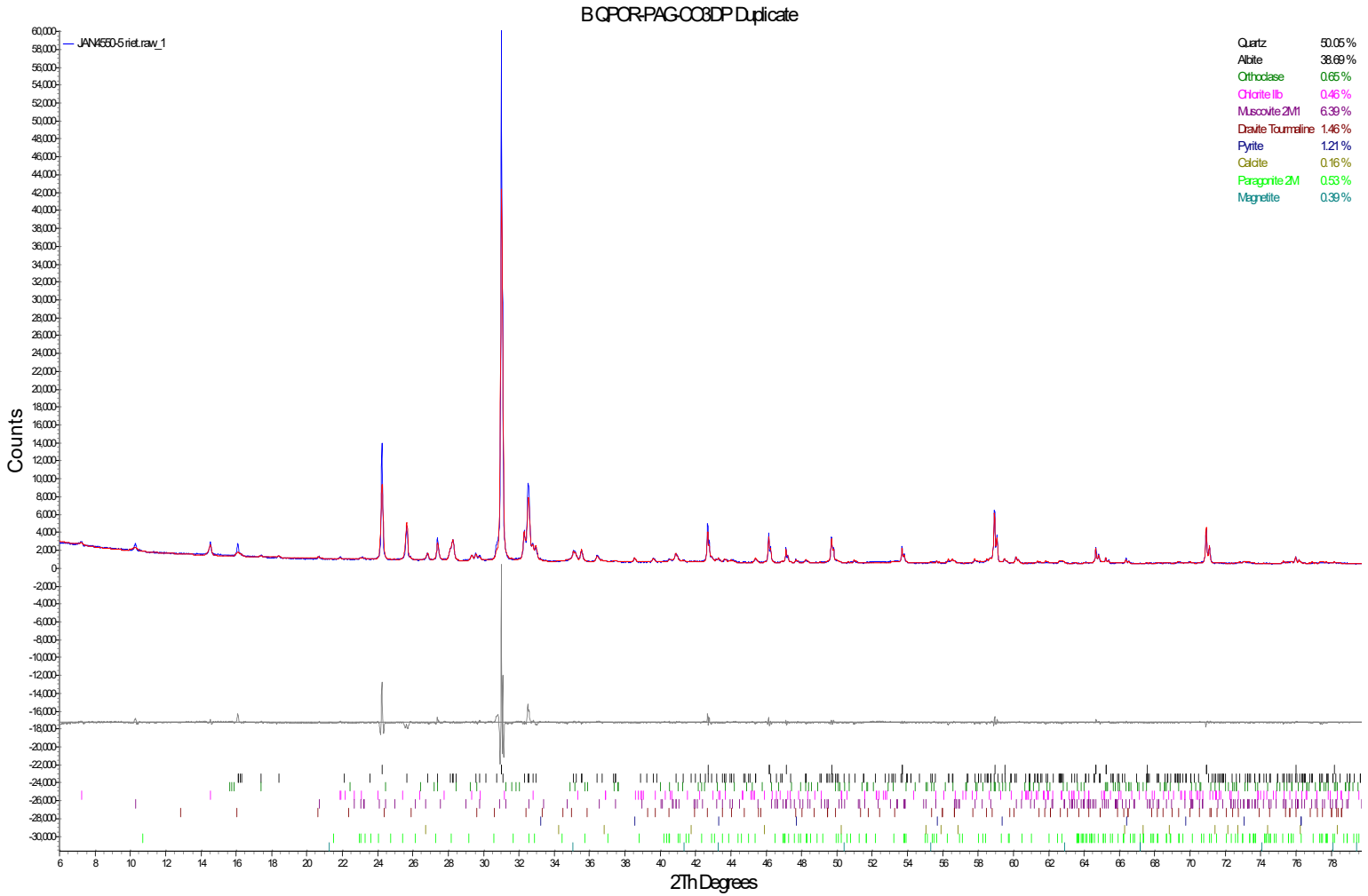


BLGO-PAG-CC8DP

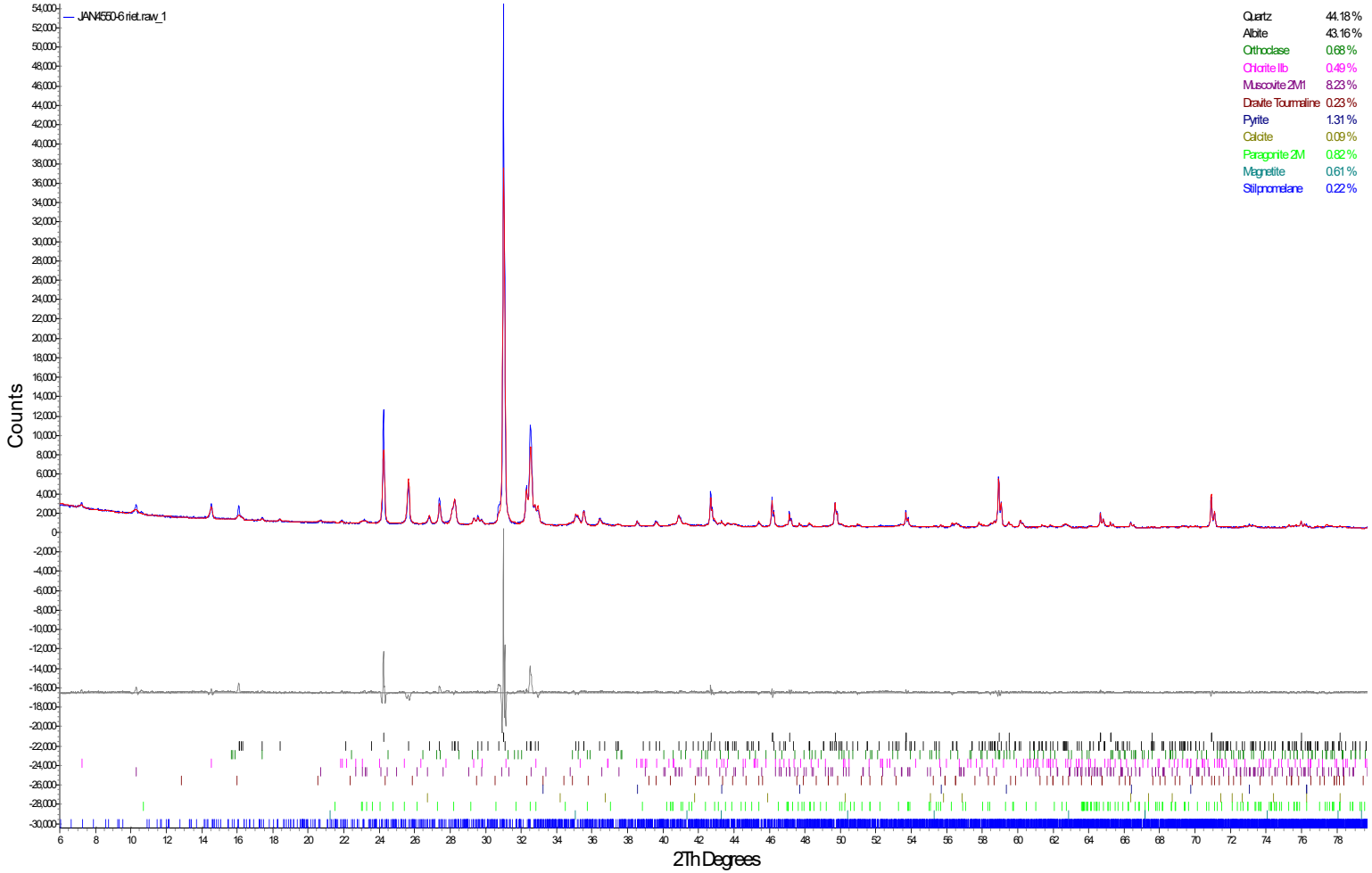


BHGO-PAG-Zn-CC8DP

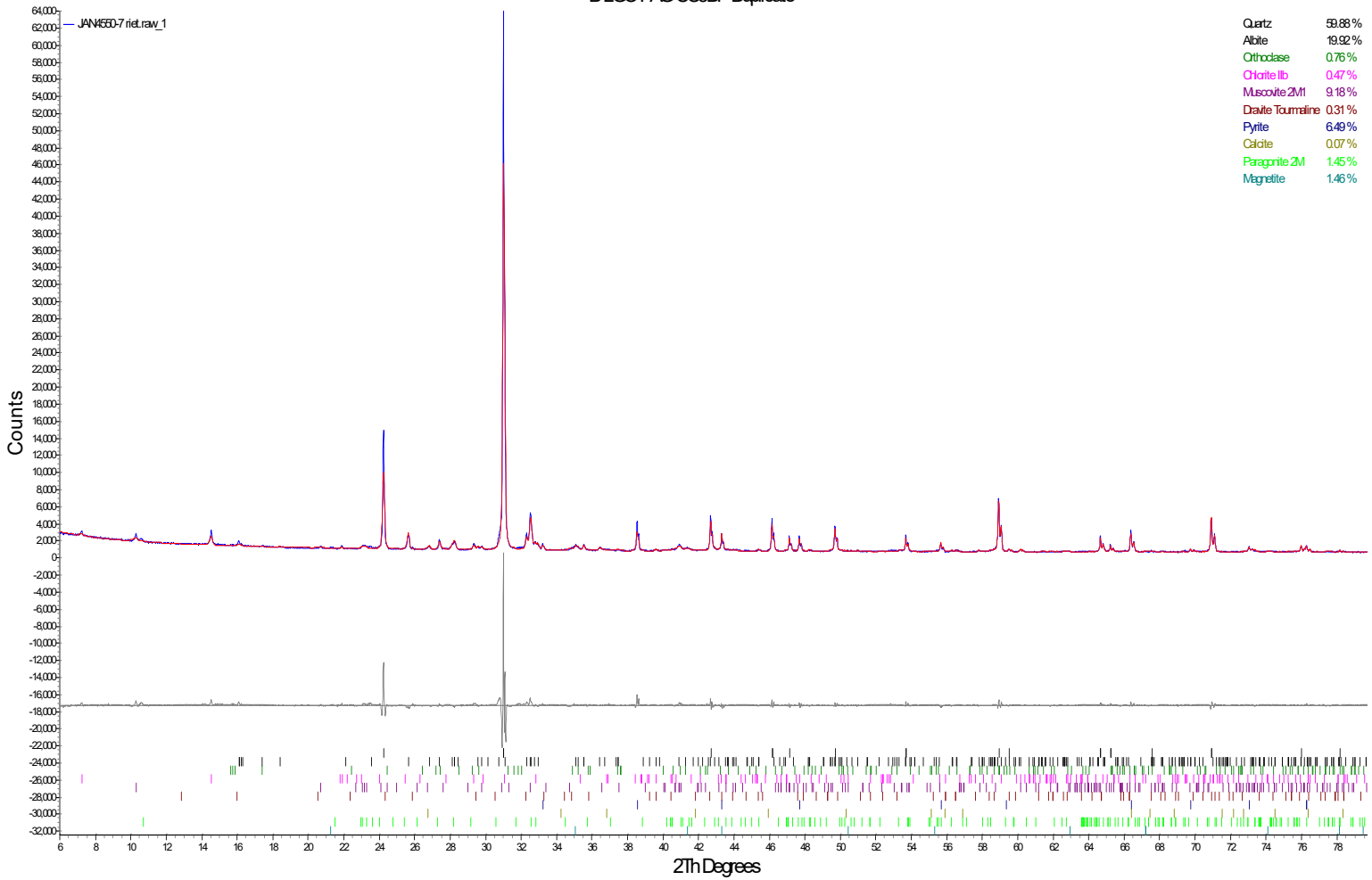



BQPOR-PAG-CC8DP Duplicate
JAN4550-5 riet.raw_1
Quartz 50.05 %
Albite 38.69 %
Orthoclase 0.65 %
Chlorite IIb 0.46 %
Muscovite 2M1 6.39 %
Dravite Tourmaline 1.46 %
Pyrite 1.21 %
Calcite 0.16 %
Paragonite 2M 0.53 %
Magnetite 0.39 %
Counts
2Th Degrees

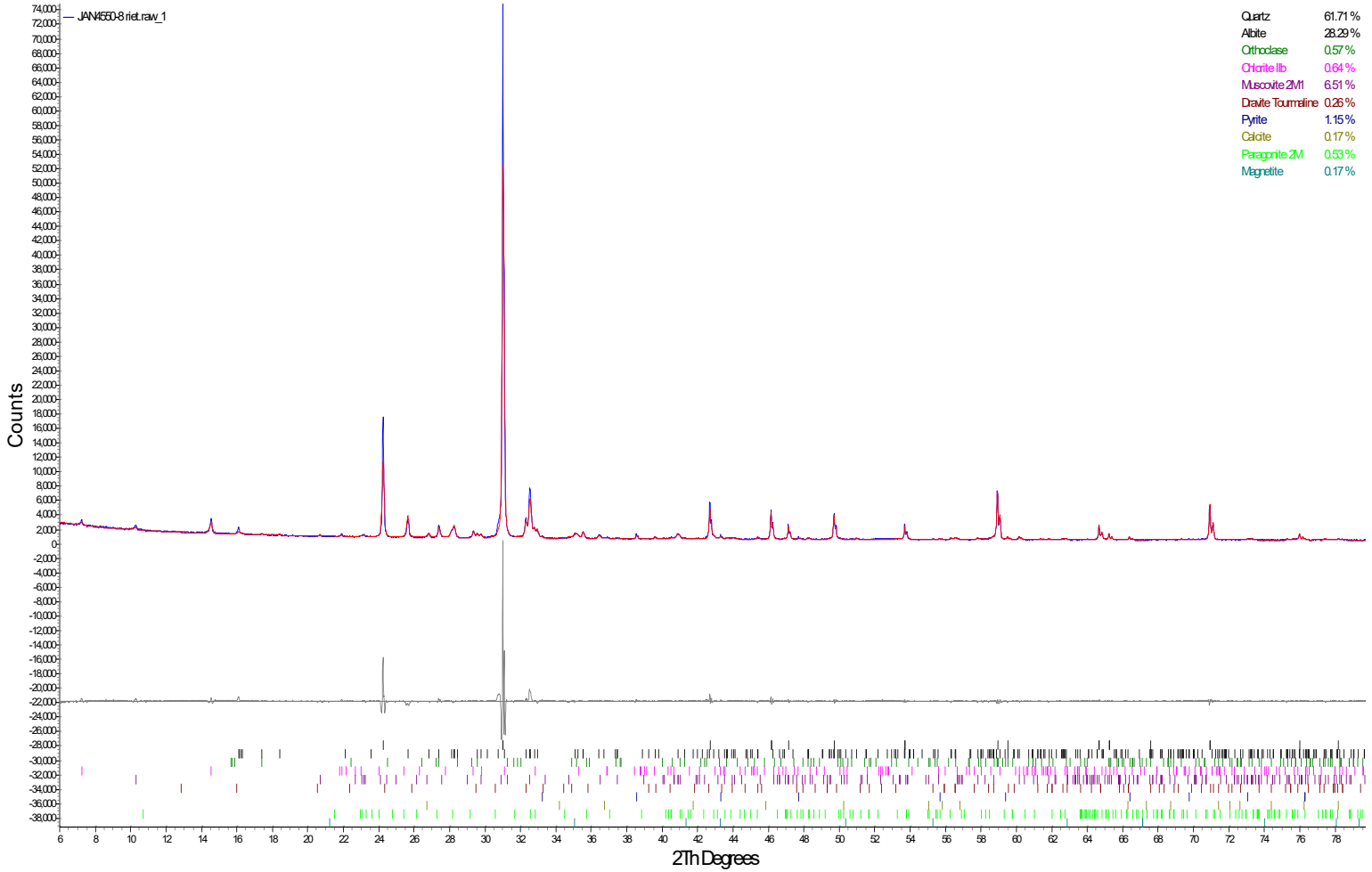
B QTP-PAG-C03DP Duplicate



BLGO-PAG-CC8DP Duplicate



BHCO-PAG-Zn-CC8DP Duplicate



D.2 STATIC TESTS

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

26-September-2022

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 24 August 2022
LR Report: **CA19147-AUG22**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: 166984	6: 167102	7: 167386	8: 168445	9: 168532	10: 168616	11: 169565
Sample Date & Time					N/A		N/A		N/A		N/A
Prep-Env AR [Prep]	22-Sep-22	09:59	26-Sep-22	10:29	1		1		1		1
Hg MS [ug/g]	23-Sep-22	13:15	26-Sep-22	10:29	< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	< 1		< 1		< 1		< 1
As [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	3.3		1.1		1.0		1.2
Al [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	12000		13000		4200		6700
Ba [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	30		36		5.0		50
Be [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	0.52		0.49		0.03		0.23
Bi [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	< 0.09		0.13		0.36		0.16
Ca [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	47000		60000		10000		41000
Cd [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	0.07		0.08		0.03		0.08
Co [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	9.9		11		3.2		9.5
Cr [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	68		56		70		46
Cu [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	12		31		2.6		25
Fe [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	23000		26000		19000		21000
K [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	1100		660		180		570
Li [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	10		6		< 2		2
Mg [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	13000		12000		2100		11000
Mn [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	920		1200		320		960
Mo [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	0.3		0.3		1.2		< 0.1
Ni [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	22		19		1.8		15
Pb [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	4.2		3.0		0.50		2.5
Sb [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	< 6		< 6		< 6		< 6
Se [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	< 2		< 2		< 2		< 2
Sr [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	79		85		7.7		42
Ti [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	270		190		20		310
Tl [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	0.03		< 0.02		< 0.02		< 0.02
U [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	0.93		0.67		0.090		1.00
V [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	27		33		5		23
Y [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	15		9.5		3.5		9.8
Zn [µg/g]	23-Sep-22	13:15	26-Sep-22	10:29	42		45		13		42

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LR Report : **CA19147-AUG22**

Analysis	12: 934952	13: 935172	14: 937527	15: 939437	16: 939706	17: 960224	18: 960691	19: 960958	20: 963179	21: 963541	22: 964658	23: 965384
Sample Date & Time		N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]		1		1		1		1		1		1
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]		5.1		1.4		1.0		0.6		< 0.5		0.8
Al [µg/g]		6000		4700		9900		9500		8100		4200
Ba [µg/g]		12		50		107		5.7		5.3		26
Be [µg/g]		0.26		0.21		0.20		0.07		0.06		0.12
Bi [µg/g]		0.13		0.14		0.10		0.11		< 0.09		< 0.09
Ca [µg/g]		9100		65000		35000		13000		15000		39000
Cd [µg/g]		< 0.02		0.12		0.10		0.08		0.03		0.04
Co [µg/g]		5.8		9.3		11		4.5		3.7		9.4
Cr [µg/g]		44		43		47		45		56		46
Cu [µg/g]		0.3		29		60		9.1		3.0		20
Fe [µg/g]		17000		21000		30000		24000		21000		22000
K [µg/g]		400		480		530		270		230		500
Li [µg/g]		4		< 2		4		< 2		2		< 2
Mg [µg/g]		6100		11000		10000		4000		3500		12000
Mn [µg/g]		620		1100		1000		590		560		860
Mo [µg/g]		< 0.1		0.1		0.2		0.6		0.5		< 0.1
Ni [µg/g]		15		12		19		1.2		1.2		7.2
Pb [µg/g]		1.7		3.2		1.3		0.71		0.29		1.9
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]		19		55		35		6.8		7.4		45
Ti [µg/g]		140		400		83		69		81		280
Tl [µg/g]		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02
U [µg/g]		0.48		0.85		0.90		0.13		0.14		0.82
V [µg/g]		19		25		34		10		14		22
Y [µg/g]		7.0		11		12		7.4		8.9		9.2
Zn [µg/g]		29		41		48		48		21		40

Analysis	24: 965790	25: 965958	26: 966043	27: 966145	28: 966933	29: 967212	30: 967393	31: 967524	32: 970453	33: 970578	34: 968738	35: 968928
Sample Date & Time		N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]		1		1		1		1		1		1
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]		1.5		1.3		1.2		< 0.5		1.3		0.6
Al [µg/g]		12000		13000		8100		8500		4000		9400
Ba [µg/g]		54		21		54		5.7		49		42
Be [µg/g]		0.27		0.35		0.21		0.04		0.17		0.17
Bi [µg/g]		0.10		0.16		0.12		< 0.09		0.20		< 0.09
Ca [µg/g]		17000		49000		41000		14000		28000		33000
Cd [µg/g]		0.04		0.08		0.09		0.04		0.05		0.10
Co [µg/g]		9.3		11		11		5.0		9.2		11
Cr [µg/g]		76		52		51		54		60		59
Cu [µg/g]		0.7		31		16		8.6		27		8.9
Fe [µg/g]		21000		26000		29000		22000		22000		22000

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Analysis	24: 965790	25: 965958	26: 966043	27: 966145	28: 966933	29: 967212	30: 967393	31: 967524	32: 970453	33: 970578	34: 968738	35: 968928
K [µg/g]		450		530		550		200		530		550
Li [µg/g]		6		7		4		3		3		5
Mg [µg/g]		11000		11000		10000		3900		11000		11000
Mn [µg/g]		940		960		980		570		800		960
Mo [µg/g]		0.2		< 0.1		< 0.1		0.4		0.1		0.1
Ni [µg/g]		22		18		19		1.4		17		13
Pb [µg/g]		1.3		2.7		3.3		0.41		1.6		1.5
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]		26		74		58		7.7		32		29
Ti [µg/g]		120		95		360		130		440		59
Tl [µg/g]		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02
U [µg/g]		0.74		0.73		0.98		0.10		0.75		0.95
V [µg/g]		16		31		40		22		26		23
Y [µg/g]		11		10.0		12		6.1		4.6		8.2
Zn [µg/g]		47		49		45		35		46		49

Analysis	36: 982589	37: 954284	38: 977884	39: 978133	40: 1023601	41: 1023762	42: 1023921	43: 1025383	44: 1015194	45: 1008325	46: 1008754
Sample Date & Time		N/A		N/A		N/A		N/A		N/A	
Prep-Env AR [Prep]		1		1		1		1		1	
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1	
As [µg/g]		1.1		< 0.5		2.4		0.9		1.4	
Al [µg/g]		7000		3600		10000		8200		13000	
Ba [µg/g]		19		8.7		28		33		42	
Be [µg/g]		0.18		0.05		0.37		0.18		0.13	
Bi [µg/g]		0.15		0.15		0.24		0.15		< 0.09	
Ca [µg/g]		36000		11000		56000		31000		38000	
Cd [µg/g]		0.06		< 0.02		0.12		0.08		0.04	
Co [µg/g]		13		7.3		9.2		11		10	
Cr [µg/g]		61		67		62		52		44	
Cu [µg/g]		17		8.5		43		24		13	
Fe [µg/g]		29000		21000		23000		26000		24000	
K [µg/g]		500		250		660		640		510	
Li [µg/g]		3		< 2		5		3		7	
Mg [µg/g]		14000		1700		9200		9500		12000	
Mn [µg/g]		1200		170		1100		890		870	
Mo [µg/g]		< 0.1		0.6		< 0.1		< 0.1		< 0.1	
Ni [µg/g]		16		1.3		15		19		8.0	
Pb [µg/g]		1.7		0.23		4.4		2.5		1.2	
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6	
Se [µg/g]		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7	
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2	
Sr [µg/g]		26		8.6		79		50		32	
Ti [µg/g]		290		12		320		470		260	
Tl [µg/g]		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02	
U [µg/g]		0.54		0.095		1.0		0.97		0.70	
V [µg/g]		32		5		31		36		32	

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LR Report : **CA19147-AUG22**

Analysis	36: 982589	37: 954284	38: 977884	39: 978133	40: 1023601	41: 1023762	42: 1023921	43: 1025383	44: 1015194	45: 1008325	46: 1008754
Y [µg/g]		8.3		6.1		11		12		7.7	
Zn [µg/g]		58		8.0		36		46		45	

Analysis	47: 1016750	48: 1017129	49: 1009891	50: 1027447	51: 1027455	52: 1018430	53: 1011111	54: 1019798	55: 1011804	56: 995902	57: 996071
Sample Date & Time	N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]	1		1		1		1		1		1
Hg MS [ug/g]	0.06		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]	< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]	< 0.5		1.0		1.0		0.6		< 0.5		0.9
Al [µg/g]	9200		5300		9500		11000		8100		11000
Ba [µg/g]	9.7		8.1		9.9		4.6		6.3		25
Be [µg/g]	0.07		0.12		0.17		0.05		0.06		0.26
Bi [µg/g]	< 0.09		0.10		0.32		0.13		< 0.09		0.20
Ca [µg/g]	11000		9900		3900		11000		17000		31000
Cd [µg/g]	0.03		0.05		< 0.02		0.02		< 0.02		0.05
Co [µg/g]	4.3		2.6		6.6		7.0		4.4		10
Cr [µg/g]	60		56		82		61		61		53
Cu [µg/g]	10		8.6		30		105		7.5		36
Fe [µg/g]	24000		13000		23000		35000		25000		24000
K [µg/g]	440		570		490		190		260		710
Li [µg/g]	3		3		5		2		2		5
Mg [µg/g]	3600		2600		5700		4700		3500		9800
Mn [µg/g]	410		340		400		740		590		840
Mo [µg/g]	0.1		2.2		0.2		0.6		0.5		< 0.1
Ni [µg/g]	1.3		1.1		7.5		1.6		1.4		17
Pb [µg/g]	1.3		0.44		0.96		0.35		0.26		2.5
Sb [µg/g]	< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]	< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]	< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]	6.3		9.6		8.1		6.8		9.5		43
Ti [µg/g]	83		21		120		110		95		290
Tl [µg/g]	< 0.02		< 0.02		0.03		< 0.02		< 0.02		< 0.02
U [µg/g]	0.15		0.18		0.31		0.099		0.15		0.98
V [µg/g]	9		7		21		17		19		30
Y [µg/g]	9.8		8.6		4.4		6.2		7.8		11
Zn [µg/g]	34		18		31		36		19		44

Analysis	58: 983936	59: 975618	60: 986301	61: 986527	62: 976319	63: 986619	64: 987176	65: 167317	66: 168506	67: 182574	68: 961457	69: 961744
Sample Date & Time		N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]		1		1		1		1		1		1
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]		1.3		1.3		1.3		0.7		2.4		0.9
Al [µg/g]		8900		7700		7300		12000		6300		8700
Ba [µg/g]		9.4		18		1068		7.0		7.9		10
Be [µg/g]		0.11		0.26		0.17		0.05		0.19		0.09

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LR Report : **CA19147-AUG22**

Analysis	58: 983936	59: 975618	60: 986301	61: 986527	62: 976319	63: 986619	64: 987176	65: 167317	66: 168506	67: 182574	68: 961457	69: 961744
Bi [µg/g]		< 0.09		< 0.09		< 0.09		0.32		0.46		< 0.09
Ca [µg/g]		11000		70000		77000		16000		24000		16000
Cd [µg/g]		0.03		0.08		0.08		< 0.02		0.07		0.07
Co [µg/g]		4.0		7.0		8.4		6.7		6.5		2.6
Cr [µg/g]		72		42		48		52		64		79
Cu [µg/g]		8.5		17		15		27		20		8.8
Fe [µg/g]		22000		18000		22000		35000		25000		22000
K [µg/g]		470		490		450		230		430		560
Li [µg/g]		2		4		4		4		2		2
Mg [µg/g]		3000		9100		10000		5200		3600		3000
Mn [µg/g]		390		1000		1500		560		730		520
Mo [µg/g]		0.6		< 0.1		< 0.1		0.5		2.7		0.2
Ni [µg/g]		1.3		5.5		7.7		1.4		1.8		1.4
Pb [µg/g]		4.7		2.5		2.5		0.31		0.90		6.3
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]		6.0		74		295		12		20		8.0
Ti [µg/g]		37		200		270		25		44		32
Tl [µg/g]		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02
U [µg/g]		0.17		0.70		0.60		0.086		0.11		0.11
V [µg/g]		4		22		28		15		6		6
Y [µg/g]		6.5		8.6		10		4.6		5.4		5.6
Zn [µg/g]		12		26		36		36		27		27

Analysis	70: 962052	71: 966413	72: 953697	73: 982894	74: 954236	75: 954535	76: 954874	77: 955411	78: 993558	79: 993900	80: 977243	81: 977550
Sample Date & Time		N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]		1		1		1		1		1		1
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]		1.4		1.8		0.9		0.7		0.9		3.4
Al [µg/g]		6500		5200		2700		1200		3500		6100
Ba [µg/g]		15		3.3		5.0		1.1		6.4		3.5
Be [µg/g]		0.12		0.04		0.03		< 0.02		0.07		0.03
Bi [µg/g]		4.5		3.9		2.8		1.1		0.40		0.84
Ca [µg/g]		10000		13000		9900		15000		11000		15000
Cd [µg/g]		< 0.02		0.09		< 0.02		< 0.02		0.02		0.25
Co [µg/g]		5.5		7.4		4.6		2.3		2.1		4.4
Cr [µg/g]		85		85		83		68		87		91
Cu [µg/g]		25		17		2.9		0.9		5.0		26
Fe [µg/g]		22000		28000		18000		12000		13000		28000
K [µg/g]		630		160		140		39		280		130
Li [µg/g]		2		< 2		< 2		< 2		< 2		< 2
Mg [µg/g]		3400		2200		1100		330		1400		2800
Mn [µg/g]		380		360		240		310		320		480
Mo [µg/g]		0.2		0.3		5.4		10		0.2		1.3
Ni [µg/g]		2.3		1.8		1.7		1.5		1.4		2.0
Pb [µg/g]		1.6		2.4		4.1		0.82		0.45		1.8
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6		< 6

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LR Report : **CA19147-AUG22**

Analysis	70: 962052	71: 966413	72: 953697	73: 982894	74: 954236	75: 954535	76: 954874	77: 955411	78: 993558	79: 993900	80: 977243	81: 977550
Se [µg/g]		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]		8.0		7.0		12		8.9		8.0		7.2
Ti [µg/g]		9.0		47		12		5.4		27		23
Tl [µg/g]		0.02		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02
U [µg/g]		0.083		0.11		0.058		0.052		0.11		0.093
V [µg/g]		8		7		2		1		3		10
Y [µg/g]		4.1		7.1		4.3		3.1		7.5		4.5
Zn [µg/g]		26		20		7.1		3.6		10		22

Analysis	82: 987879	83: 959394	84: 988032	85: 977937	86: 978315	87: 1023510	88: 1006148	89: 1006508	90: 1024643	91: 1006790	92: 954411	93: 1024043
Sample Date & Time		N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]		1		1		1		1		1		1
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]		2.6		4.4		1.4		4.5		1.2		< 0.5
Al [µg/g]		3300		2300		4600		3700		2600		7700
Ba [µg/g]		4.5		12		6.7		5.5		6.8		6.9
Be [µg/g]		0.05		0.05		0.05		0.05		0.05		0.07
Bi [µg/g]		0.27		1.3		1.1		0.46		12		0.34
Ca [µg/g]		7900		3300		13000		6600		26000		15000
Cd [µg/g]		< 0.02		< 0.02		0.02		< 0.02		0.04		0.06
Co [µg/g]		5.8		20		7.7		2.5		7.0		4.0
Cr [µg/g]		105		80		92		107		102		70
Cu [µg/g]		48		5.1		4.1		34		2.5		11
Fe [µg/g]		16000		91000		25000		14000		14000		20000
K [µg/g]		200		640		290		240		280		380
Li [µg/g]		< 2		< 2		< 2		< 2		< 2		< 2
Mg [µg/g]		1500		530		2000		1200		1600		3400
Mn [µg/g]		290		93		380		240		810		530
Mo [µg/g]		0.6		2.4		4.6		0.5		0.7		1.5
Ni [µg/g]		1.9		1.3		2.0		1.7		3.4		1.6
Pb [µg/g]		0.80		1.7		1.9		0.68		0.60		0.67
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]		< 0.7		1.3		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]		7.6		5.2		11		5.0		19		9.6
Ti [µg/g]		14		14		12		18		9.3		56
Tl [µg/g]		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02
U [µg/g]		0.039		0.094		0.065		0.13		0.10		0.12
V [µg/g]		3		< 1		5		2		3		7
Y [µg/g]		1.9		1.9		3.3		3.0		7.1		5.4
Zn [µg/g]		8.6		3.4		13		9.1		9.8		26

Analysis	94: 1024143	95: 1014178	96: 1014138	97: 1014189	98: 1007031	99: 1007347	100: 1016824	101: 1007426	102: 1015017	103: 1025702	104: 1026178
Sample Date & Time		N/A				N/A		N/A		N/A	

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LR Report : **CA19147-AUG22**

Analysis	94: 1024143	95: 1014178	96: 1014138	97: 1014189	98: 1007031	99: 1007347	100: 1016824	101: 1007426	102: 1015017	103: 1025702	104: 1026178
Prep-Env AR [Prep]		1				1		1		1	
Hg MS [ug/g]		< 0.05				< 0.05		< 0.05		< 0.05	
Ag [µg/g]		< 1				< 1		< 1		< 1	
As [µg/g]		1.9				1.8		2.8		< 0.5	
Al [µg/g]		6700				7200		7600		9900	
Ba [µg/g]		6.5				5.6		9.0		5.7	
Be [µg/g]		0.07				0.12		0.09		0.08	
Bi [µg/g]		0.62				0.12		0.60		0.16	
Ca [µg/g]		17000				11000		13000		16000	
Cd [µg/g]		0.08				0.03		0.03		< 0.02	
Co [µg/g]		5.2				3.8		9.1		4.9	
Cr [µg/g]		93				87		74		73	
Cu [µg/g]		12				10		39		4.4	
Fe [µg/g]		27000				21000		34000		26000	
K [µg/g]		240				300		390		280	
Li [µg/g]		< 2				2		< 2		3	
Mg [µg/g]		3500				2600		2800		4700	
Mn [µg/g]		560				360		500		510	
Mo [µg/g]		0.8				0.2		0.2		0.2	
Ni [µg/g]		1.9				1.5		1.5		1.6	
Pb [µg/g]		1.2				0.63		0.87		0.30	
Sb [µg/g]		< 6				< 6		< 6		< 6	
Se [µg/g]		< 0.7				< 0.7		< 0.7		< 0.7	
Sn [µg/g]		< 2				< 2		< 2		< 2	
Sr [µg/g]		13				12		10		15	
Ti [µg/g]		35				39		74		67	
Tl [µg/g]		< 0.02				< 0.02		< 0.02		< 0.02	
U [µg/g]		0.12				0.13		0.12		0.10	
V [µg/g]		8				7		7		13	
Y [µg/g]		6.2				5.3		5.7		6.3	
Zn [µg/g]		25				17		26		29	

Analysis	105: 1026138	106: 1026408	107: 1008488	108: 1008340	109: 1008876	110: 1009326	111: 1027298	112: 1027382	113: 1009713	114: 1043650	115: 1044017
Sample Date & Time	N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]	1		1		1		1		1		1
Hg MS [ug/g]	< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]	< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]	0.7		2.5		3.5		< 0.5		0.8		3.5
Al [µg/g]	9100		8000		6600		7300		7700		14000
Ba [µg/g]	3.9		7.4		7.7		3.5		7.6		6.2
Be [µg/g]	0.07		0.07		0.11		0.04		0.10		0.06
Bi [µg/g]	1.1		2.5		11		1.1		0.25		1.0
Ca [µg/g]	14000		14000		16000		11000		16000		10000
Cd [µg/g]	< 0.02		0.16		0.06		0.02		< 0.02		< 0.02
Co [µg/g]	5.8		5.5		2.4		3.7		4.9		14
Cr [µg/g]	77		72		83		64		79		61
Cu [µg/g]	2.6		48		27		1.8		5.9		60
Fe [µg/g]	26000		28000		17000		21000		19000		50000
K [µg/g]	200		330		560		200		450		240

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LR Report : **CA19147-AUG22**

Analysis	105: 1026138	106: 1026408	107: 1008488	108: 1008340	109: 1008876	110: 1009326	111: 1027298	112: 1027382	113: 1009713	114: 1043650	115: 1044017
Li [µg/g]	3		2		< 2		< 2		< 2		4
Mg [µg/g]	3900		3500		2500		3000		3600		5300
Mn [µg/g]	530		480		500		310		480		480
Mo [µg/g]	1.0		1.3		0.3		0.7		0.6		1.0
Ni [µg/g]	1.6		1.6		1.7		1.3		2.6		1.4
Pb [µg/g]	0.62		14		8.4		0.67		0.70		0.63
Sb [µg/g]	< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]	< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]	< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]	12		14		21		6.9		23		11
Ti [µg/g]	37		36		22		84		40		45
Tl [µg/g]	< 0.02		< 0.02		< 0.02		< 0.02		0.03		< 0.02
U [µg/g]	0.11		0.10		0.10		0.096		0.22		0.10
V [µg/g]	12		10		5		8		11		16
Y [µg/g]	7.3		5.1		4.6		5.8		6.1		4.5
Zn [µg/g]	25		30		17		14		21		39

Analysis	116: 1044097	117: 996541	118: 989877	119: 973322	120: 956379	121: 956542	122: 984474	123: 957562	124: 957928	125: 958200	126: 986925	127: 182172
Sample Date & Time		N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]		1		1		1		1		1		1
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]		0.9		2.4		1.2		0.5		0.6		0.7
Al [µg/g]		5500		4500		5200		18000		17000		6200
Ba [µg/g]		7.1		6.0		17		6.7		5.1		9.2
Be [µg/g]		0.04		0.04		0.08		0.09		0.10		0.06
Bi [µg/g]		2.6		0.54		1.9		0.15		1.9		0.23
Ca [µg/g]		18000		12000		16000		31000		34000		16000
Cd [µg/g]		0.04		0.13		< 0.02		0.04		0.04		< 0.02
Co [µg/g]		6.1		3.5		9.0		9.8		3.1		4.6
Cr [µg/g]		72		76		89		124		202		76
Cu [µg/g]		2.1		39		4.1		41		5.2		30
Fe [µg/g]		28000		21000		27000		33000		34000		26000
K [µg/g]		240		260		610		250		180		410
Li [µg/g]		< 2		< 2		< 2		6		5		2
Mg [µg/g]		2900		2100		2200		13000		12000		3200
Mn [µg/g]		480		330		500		860		1100		490
Mo [µg/g]		0.5		6.3		1.7		0.7		0.8		0.8
Ni [µg/g]		1.6		1.5		3.1		21		23		2.3
Pb [µg/g]		0.88		1.8		1.7		2.0		3.3		0.67
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]		9.6		11		13		17		33		22
Ti [µg/g]		13		19		15		54		36		41
Tl [µg/g]		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02
U [µg/g]		0.087		0.12		0.11		0.094		0.077		0.11
V [µg/g]		9		5		6		49		22		12
Y [µg/g]		5.1		3.5		5.4		6.7		5.8		4.6

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LR Report : **CA19147-AUG22**

Analysis	116: 1044097	117: 996541	118: 989877	119: 973322	120: 956379	121: 956542	122: 984474	123: 957562	124: 957928	125: 958200	126: 986925	127: 182172
Zn [µg/g]		17		19		15		54		52		20

Analysis	128: 991156	129: 1009992	130: 1010237	131: 989779	132: 955824	133: 955884	134: 1006198	135: 1010388	136: 1010413	137: 1010700	138: 1006857
Sample Date & Time		N/A		N/A		N/A		N/A		N/A	
Prep-Env AR [Prep]		1		1		1		1		1	
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05	
Ag [µg/g]		< 1		< 1		< 1		< 1		< 1	
As [µg/g]		4.3		< 0.5		0.5		1.0		2.9	
Al [µg/g]		5600		6100		7100		5900		10000	
Ba [µg/g]		8.7		4.5		6.5		3.9		5.8	
Be [µg/g]		0.08		0.04		0.05		0.07		0.10	
Bi [µg/g]		0.18		0.19		0.64		1.5		0.53	
Ca [µg/g]		22000		18000		19000		21000		13000	
Cd [µg/g]		< 0.02		0.03		0.06		< 0.02		0.05	
Co [µg/g]		3.6		3.7		5.2		7.9		5.5	
Cr [µg/g]		76		62		68		78		68	
Cu [µg/g]		28		6.5		2.5		3.7		74	
Fe [µg/g]		19000		18000		24000		25000		30000	
K [µg/g]		430		240		290		190		360	
Li [µg/g]		< 2		< 2		< 2		< 2		3	
Mg [µg/g]		2400		2500		3800		2900		3800	
Mn [µg/g]		560		580		510		550		660	
Mo [µg/g]		0.7		1.0		1.6		0.8		1.0	
Ni [µg/g]		2.1		1.7		2.0		2.6		2.0	
Pb [µg/g]		0.86		0.42		0.72		1.8		1.0	
Sb [µg/g]		< 6		< 6		< 6		< 6		< 6	
Se [µg/g]		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7	
Sn [µg/g]		< 2		< 2		< 2		< 2		< 2	
Sr [µg/g]		20		14		12		28		15	
Ti [µg/g]		16		18		50		31		46	
Tl [µg/g]		0.04		< 0.02		< 0.02		< 0.02		< 0.02	
U [µg/g]		0.089		0.056		0.13		0.080		0.12	
V [µg/g]		5		6		11		8		15	
Y [µg/g]		5.2		4.8		7.1		5.5		7.1	
Zn [µg/g]		14		19		22		12		57	

Analysis	139: 1010941	140: 1018771	141: 1011231	142: 1019658	143: 1019827	144: 1011905	145: 1020450	146: 1021458	147: 1022334	148: 1022283	149: 1030811
Sample Date & Time	N/A		N/A		N/A		N/A		N/A		N/A
Prep-Env AR [Prep]	1		1		1		1		1		1
Hg MS [ug/g]	< 0.05		< 0.05		< 0.05		< 0.05		< 0.05		< 0.05
Ag [µg/g]	< 1		< 1		< 1		< 1		< 1		< 1
As [µg/g]	5.0		1.5		2.7		0.8		2.5		8.7
Al [µg/g]	10000		3700		12000		1200		3900		2000
Ba [µg/g]	4.7		3.4		3.8		7.3		6.1		4.2
Be [µg/g]	0.17		0.04		0.15		0.03		0.06		0.03
Bi [µg/g]	2.0		0.49		0.29		0.42		0.35		1.6

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LR Report : **CA19147-AUG22**

Analysis	139: 1010941	140: 1018771	141: 1011231	142: 1019658	143: 1019827	144: 1011905	145: 1020450	146: 1021458	147: 1022334	148: 1022283	149: 1030811
Ca [µg/g]	15000		19000		17000		5200		14000		30000
Cd [µg/g]	0.05		0.03		0.04		< 0.02		0.02		0.08
Co [µg/g]	5.6		4.1		5.1		5.1		6.1		60
Cr [µg/g]	70		82		63		64		65		44
Cu [µg/g]	14		6.2		16		5.2		30		24
Fe [µg/g]	32000		19000		35000		31000		21000		100000
K [µg/g]	440		150		230		260		280		140
Li [µg/g]	3		< 2		4		< 2		< 2		< 2
Mg [µg/g]	4700		1900		6800		340		1200		1300
Mn [µg/g]	430		630		710		79		470		400
Mo [µg/g]	2.0		1.4		0.6		1.0		1.0		0.4
Ni [µg/g]	2.1		2.2		2.4		2.0		2.2		6.4
Pb [µg/g]	1.9		0.36		2.6		0.44		0.56		9.4
Sb [µg/g]	< 6		< 6		< 6		< 6		< 6		< 6
Se [µg/g]	< 0.7		< 0.7		< 0.7		1.4		< 0.7		2.3
Sn [µg/g]	< 2		< 2		< 2		< 2		< 2		< 2
Sr [µg/g]	19		11		22		5.4		10		15
Ti [µg/g]	24		18		100		3.6		11		3.8
Tl [µg/g]	0.08		< 0.02		< 0.02		< 0.02		< 0.02		< 0.02
U [µg/g]	0.14		0.097		0.11		0.055		0.066		0.025
V [µg/g]	13		5		11		< 1		4		< 1
Y [µg/g]	4.6		6.5		5.4		2.7		7.4		4.2
Zn [µg/g]	23		12		53		1.7		11		13

Analysis	150: 1042567	151: 1048365	152: 996297	153: 956228	154: 956284	155: 957775	156: 986388
Sample Date & Time		N/A		N/A		N/A	
Prep-Env AR [Prep]		1		1		1	
Hg MS [ug/g]		< 0.05		< 0.05		< 0.05	
Ag [µg/g]		< 1		< 1		< 1	
As [µg/g]		2.6		< 0.5		1.8	
Al [µg/g]		4300		3200		5000	
Ba [µg/g]		5.3		2.6		5.9	
Be [µg/g]		0.10		0.03		0.07	
Bi [µg/g]		< 0.09		0.24		0.42	
Ca [µg/g]		10000		3600		35000	
Cd [µg/g]		0.23		< 0.02		0.06	
Co [µg/g]		4.1		1.9		11	
Cr [µg/g]		56		48		38	
Cu [µg/g]		17		35		4.4	
Fe [µg/g]		15000		10000		30000	
K [µg/g]		240		120		370	
Li [µg/g]		< 2		< 2		< 2	
Mg [µg/g]		1500		1500		2300	
Mn [µg/g]		280		310		890	
Mo [µg/g]		0.3		0.2		0.8	
Ni [µg/g]		1.4		1.1		1.8	
Pb [µg/g]		5.1		0.12		3.0	
Sb [µg/g]		< 6		< 6		< 6	
Se [µg/g]		< 0.7		< 0.7		< 0.7	

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LR Report : **CA19147-AUG22**

Analysis	150: 1042567	151: 1048365	152: 996297	153: 956228	154: 956284	155: 957775	156: 986388
Sn [µg/g]		< 2		< 2		< 2	
Sr [µg/g]		8.8		2.2		28	
Ti [µg/g]		22		17		15	
Tl [µg/g]		< 0.02		< 0.02		< 0.02	
U [µg/g]		0.083		0.020		0.095	
V [µg/g]		10		3		4	
Y [µg/g]		5.1		3.2		8.6	
Zn [µg/g]		16		14		13	

<original signed by>

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

OnLine LIMS

0003062984

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27-September-2022

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 24 August 2022
LR Report: **CA19148-AUG22**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: 166984	6: 167102	7: 167386	8: 168445	9: 168532
Sample Date & Time					N/A		N/A		N/A
Sample weight [g]	12-Sep-22	08:38	14-Sep-22	14:32	250		250		250
Volume D.I. Water [mL]	12-Sep-22	08:38	14-Sep-22	14:32	750		750		750
Final pH [no unit]	12-Sep-22	08:38	14-Sep-22	14:32	9.20		9.27		9.33
pH [No unit]	14-Sep-22	08:28	19-Sep-22	08:50	7.85		7.99		7.73
Conductivity [uS/cm]	14-Sep-22	08:28	19-Sep-22	08:50	93		97		88
Alkalinity [mg/L as CaCO3]	14-Sep-22	08:28	19-Sep-22	08:50	34		45		29
SO4 [mg/L]	14-Sep-22	11:47	19-Sep-22	15:48	3		3		5
F [mg/L]	14-Sep-22	09:06	15-Sep-22	12:59	0.08		0.12		< 0.06
Hg [mg/L]	20-Sep-22	16:04	21-Sep-22	17:24	< 0.00001		< 0.00001		< 0.00001
Ag [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.00005		< 0.00005		< 0.00005
Al [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.836		1.13		0.570
As [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.0015		0.0016		0.0017
Ba [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.00132		0.00362		0.00098
B [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.009		0.009		0.009
Be [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.000007		< 0.000007		< 0.000007
Bi [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.00001		< 0.00001		< 0.00001
Ca [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	6.90		5.98		9.22
Cd [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.000003		< 0.000003		0.000003
Co [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.000011		< 0.000004		0.000015
Cr [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.00024		0.00012		0.00011
Cu [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.0004		0.0004		0.0004
Fe [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.007		< 0.007		0.021
K [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	8.58		4.53		2.59
Li [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.0002		0.0002		< 0.0001
Mg [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.691		0.929		0.525
Mn [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.00130		0.00112		0.00198
Mo [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.00040		0.00042		0.00072
Na [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	7.08		11.2		6.28
Ni [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.0001		< 0.0001		< 0.0001
Pb [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.00009		< 0.00009		< 0.00009
Sb [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.0010		0.0009		0.0009
Se [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.00020		0.00010		0.00011
Si [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	1.95		1.52		3.09
Sn [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.0724		0.0779		0.0113

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LR Report : CA19148-AUG22

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: 166984	6: 167102	7: 167386	8: 168445	9: 168532
Ti [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.00012		0.00017		0.00053
Tl [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.000005		< 0.000005		< 0.000005
U [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.000157		0.000695		0.000120
V [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	0.00703		0.00497		0.00214
Zn [mg/L]	16-Sep-22	14:05	27-Sep-22	09:19	< 0.002		< 0.002		< 0.002
pH Check <2 [pH]	14-Sep-22	18:57	27-Sep-22	09:19	1.00		1.00		1.00

Analysis	10: 168616	11: 169565	12: 934952	13: 935172	14: 937527	15: 939437	16: 939706	17: 960224	18: 960691	19: 960958
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.34		9.58		9.29		9.21		9.48
pH [No unit]		8.89		7.85		8.00		7.96		7.73
Conductivity [uS/cm]		94		72		120		123		73
Alkalinity [mg/L as CaCO3]		41		35		50		43		35
SO4 [mg/L]		3		< 2		7		12		< 2
F [mg/L]		0.12		0.13		0.08		0.15		0.08
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		1.05		0.994		0.885		0.705		1.13
As [mg/L]		0.0019		0.0028		0.0009		0.0006		0.0009
Ba [mg/L]		0.00802		0.00225		0.04165		0.106		0.00078
B [mg/L]		0.007		0.010		0.025		0.014		0.007
Be [mg/L]		< 0.000007		0.000012		< 0.000007		< 0.000007		< 0.000007
Bi [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ca [mg/L]		5.90		3.64		7.16		8.81		6.17
Cd [mg/L]		< 0.000003		< 0.000003		0.000006		0.000007		0.000004
Co [mg/L]		< 0.000004		0.000031		< 0.000004		0.000006		0.000006
Cr [mg/L]		< 0.00008		0.00033		< 0.00008		0.00015		< 0.00008
Cu [mg/L]		0.0005		0.0002		0.0005		0.0004		0.0002
Fe [mg/L]		< 0.007		0.032		< 0.007		< 0.007		0.021
K [mg/L]		5.33		3.12		8.63		7.63		3.78
Li [mg/L]		0.0002		0.0002		0.0004		0.0002		< 0.0001
Mg [mg/L]		0.842		0.383		1.62		1.43		0.373
Mn [mg/L]		0.00151		0.00262		0.00223		0.00195		0.00095
Mo [mg/L]		0.00070		0.00030		0.00042		0.00481		0.00077
Na [mg/L]		9.64		11.2		10.1		9.94		7.28
Ni [mg/L]		< 0.0001		< 0.0001		< 0.0001		< 0.0001		< 0.0001
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		< 0.00009
Sb [mg/L]		< 0.0009		0.0013		0.0017		0.0011		< 0.0009
Se [mg/L]		0.00008		0.00005		0.00005		0.00013		0.00010
Si [mg/L]		2.14		2.54		1.94		1.71		2.10
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]		0.0732		0.0313		0.0653		0.179		0.00731
Ti [mg/L]		0.00006		0.00192		0.00011		0.00015		0.00032
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		< 0.000005
U [mg/L]		0.000852		0.000346		0.000917		0.000283		0.000109
V [mg/L]		0.00626		0.00597		0.00442		0.00547		0.00278
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002

OnLine LIMS

0003063906

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LR Report : **CA19148-AUG22**

Analysis	10: 168616	11: 169565	12: 934952	13: 935172	14: 937527	15: 939437	16: 939706	17: 960224	18: 960691	19: 960958
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	20: 963179	21: 963541	22: 964658	23: 965384	24: 965790	25: 965958	26: 966043	27: 966145	28: 966933	29: 967212
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.42		9.23		9.41		9.34		9.14
pH [No unit]		7.90		8.10		8.41		7.89		7.94
Conductivity [uS/cm]		83		105		99		90		105
Alkalinity [mg/L as CaCO3]		34		51		46		38		46
SO4 [mg/L]		< 2		< 2		2		2		5
F [mg/L]		0.10		0.09		0.21		0.11		0.14
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		1.22		1.41		0.771		1.11		1.18
As [mg/L]		0.0006		0.0020		0.0034		0.0007		0.0010
Ba [mg/L]		0.00051		0.00207		0.00147		0.00166		0.01813
B [mg/L]		0.015		0.009		0.065		0.011		0.009
Be [mg/L]		< 0.000007		< 0.000007		< 0.000007		< 0.000007		< 0.000007
Bi [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ca [mg/L]		6.75		5.30		4.57		5.81		5.59
Cd [mg/L]		0.000007		< 0.000003		< 0.000003		< 0.000003		0.000009
Co [mg/L]		0.000004		< 0.000004		0.000013		< 0.000004		0.000006
Cr [mg/L]		0.00012		0.00011		0.00058		0.00008		< 0.00008
Cu [mg/L]		0.0002		0.0003		0.0003		0.0002		< 0.0002
Fe [mg/L]		0.012		< 0.007		0.026		< 0.007		< 0.007
K [mg/L]		2.97		5.13		2.11		5.24		6.29
Li [mg/L]		< 0.0001		0.0003		0.0003		0.0002		0.0003
Mg [mg/L]		0.412		0.973		0.467		0.472		0.771
Mn [mg/L]		0.00100		0.00125		0.00133		0.00070		0.00157
Mo [mg/L]		0.00022		0.00055		0.00042		0.00031		0.00036
Na [mg/L]		8.88		13.5		16.7		9.22		10.4
Ni [mg/L]		< 0.0001		< 0.0001		0.0001		< 0.0001		< 0.0001
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		< 0.00009
Sb [mg/L]		< 0.0009		0.0012		< 0.0009		< 0.0009		0.0011
Se [mg/L]		0.00007		0.00008		0.00005		0.00011		0.00013
Si [mg/L]		2.13		1.90		2.26		1.67		2.17
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]		0.0137		0.0589		0.0461		0.0360		0.0879
Ti [mg/L]		0.00022		0.00017		0.00117		< 0.00005		0.00016
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		< 0.000005
U [mg/L]		0.000080		0.001814		0.000424		0.000171		0.000339
V [mg/L]		0.00331		0.00765		0.00499		0.00998		0.00544
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

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LR Report : **CA19148-AUG22**

Analysis	30: 967393	31: 967524	32: 970453	33: 970578	34: 968738	35: 968928	36: 982589	37: 954284	38: 977884	39: 978133
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.34		9.34		9.12		9.35		9.30
pH [No unit]		7.82		7.84		7.81		7.90		7.77
Conductivity [uS/cm]		72		92		84		91		92
Alkalinity [mg/L as CaCO3]		35		44		40		44		32
SO4 [mg/L]		< 2		< 2		< 2		< 2		6
F [mg/L]		0.07		0.10		0.20		0.12		0.12
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		1.03		0.793		0.474		0.842		0.847
As [mg/L]		0.0013		0.0050		0.0004		0.0009		0.0009
Ba [mg/L]		0.00060		0.00355		0.00100		0.00069		0.00160
B [mg/L]		0.013		0.008		0.014		0.008		0.005
Be [mg/L]		< 0.000007		< 0.000007		< 0.000007		0.000009		< 0.000007
Bi [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ca [mg/L]		6.62		5.92		7.04		6.53		8.71
Cd [mg/L]		0.000005		0.000004		0.000003		0.000010		< 0.000003
Co [mg/L]		0.000004		< 0.000004		< 0.000004		0.000012		0.000014
Cr [mg/L]		< 0.00008		0.00027		0.00009		0.00009		0.00010
Cu [mg/L]		0.0002		0.0004		0.0003		0.0007		0.0002
Fe [mg/L]		0.012		0.007		0.010		0.008		0.036
K [mg/L]		2.21		5.66		3.02		4.05		2.29
Li [mg/L]		< 0.0001		0.0004		0.0003		0.0003		0.0001
Mg [mg/L]		0.451		1.55		1.04		1.27		0.448
Mn [mg/L]		0.00126		0.00189		0.00178		0.00181		0.00180
Mo [mg/L]		0.00034		0.00024		0.00157		0.00074		0.00038
Na [mg/L]		7.84		10.5		13.3		12.6		8.63
Ni [mg/L]		< 0.0001		0.0001		< 0.0001		< 0.0001		< 0.0001
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		< 0.00009
Sb [mg/L]		0.0010		0.0021		< 0.0009		0.0009		< 0.0009
Se [mg/L]		0.00009		0.00017		< 0.00004		0.00011		0.00013
Si [mg/L]		2.23		2.32		1.92		2.71		2.74
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]		0.00781		0.0490		0.0131		0.0118		0.0213
Ti [mg/L]		0.00024		0.00015		0.00025		0.00029		0.00054
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		< 0.000005
U [mg/L]		0.000109		0.001506		0.000185		0.000404		0.000146
V [mg/L]		0.00403		0.00640		0.00287		0.00451		0.00191
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	40: 1023601	41: 1023762	42: 1023921	43: 1025383	44: 1015194	45: 1008325	46: 1008754	47: 1016750	48: 1017129	49: 1009891
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.44		9.38		9.56		9.23		9.33
pH [No unit]		8.70		7.95		8.81		8.96		9.33

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LR Report : **CA19148-AUG22**

Analysis	40: 1023601	41: 1023762	42: 1023921	43: 1025383	44: 1015194	45: 1008325	46: 1008754	47: 1016750	48: 1017129	49: 1009891
Conductivity [uS/cm]		88		87		66		102		103
Alkalinity [mg/L as CaCO3]		36		35		31		43		43
SO4 [mg/L]		3		6		< 2		3		3
F [mg/L]		0.11		0.13		< 0.06		0.21		0.15
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		0.804		1.25		1.26		0.814		0.730
As [mg/L]		0.0056		0.0007		0.0005		0.0007		0.0015
Ba [mg/L]		0.00206		0.00432		0.00705		0.00236		0.00341
B [mg/L]		0.007		0.009		0.004		0.063		0.236
Be [mg/L]		0.000011		0.000011		0.000007		0.000024		0.000033
Bi [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		0.00001
Ca [mg/L]		5.63		8.27		6.31		7.51		5.79
Cd [mg/L]		0.000007		0.000009		0.000008		< 0.000003		0.000024
Co [mg/L]		0.000007		0.000010		0.000007		0.000009		0.000046
Cr [mg/L]		0.00018		0.00044		0.00008		0.00040		0.00066
Cu [mg/L]		0.0003		0.0003		< 0.0002		0.0003		0.0008
Fe [mg/L]		0.014		0.032		< 0.007		0.079		0.144
K [mg/L]		6.59		5.50		4.96		4.21		4.68
Li [mg/L]		0.0002		0.0002		0.0001		0.0003		0.0003
Mg [mg/L]		0.466		0.987		0.484		0.467		0.524
Mn [mg/L]		0.00134		0.00210		0.00085		0.00087		0.00495
Mo [mg/L]		0.00023		0.00048		0.00030		0.00044		0.00560
Na [mg/L]		9.04		6.73		7.08		12.3		18.1
Ni [mg/L]		< 0.0001		< 0.0001		< 0.0001		< 0.0001		0.0002
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		0.00047
Sb [mg/L]		< 0.0009		< 0.0009		< 0.0009		0.0013		< 0.0009
Se [mg/L]		0.00016		0.00017		0.00014		0.00017		0.00036
Si [mg/L]		2.06		2.02		2.24		1.40		3.20
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		0.00010
Sr [mg/L]		0.0556		0.534		0.0507		0.0203		0.0260
Ti [mg/L]		0.00056		0.00021		0.00019		0.00130		0.01038
Tl [mg/L]		0.000005		< 0.000005		< 0.000005		< 0.000005		< 0.000005
U [mg/L]		0.000262		0.000303		0.000111		0.000157		0.000247
V [mg/L]		0.00787		0.00442		0.00461		0.00167		0.00649
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	50: 1027447	51: 1027455	52: 1018430	53: 1011111	54: 1019798	55: 1011804	56: 995902	57: 996071	58: 983936	59: 975618
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.26		9.09		9.47		9.45		9.28
pH [No unit]		9.38		8.08		8.48		8.63		8.54
Conductivity [uS/cm]		112		94		75		79		111
Alkalinity [mg/L as CaCO3]		42		39		33		35		41
SO4 [mg/L]		6		< 2		< 2		< 2		3
F [mg/L]		0.17		0.12		0.06		0.12		0.17
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001

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Analysis	50: 1027447	51: 1027455	52: 1018430	53: 1011111	54: 1019798	55: 1011804	56: 995902	57: 996071	58: 983936	59: 975618
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		0.860		0.979		1.13		1.17		0.698
As [mg/L]		0.0019		0.0006		0.0006		0.0012		0.0018
Ba [mg/L]		0.00294		0.00089		0.00073		0.00113		0.00245
B [mg/L]		0.100		0.018		0.016		0.009		0.064
Be [mg/L]		0.000031		0.000032		0.000028		< 0.000007		0.000017
Bi [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ca [mg/L]		4.85		10.2		7.26		6.00		6.56
Cd [mg/L]		0.000045		0.000056		0.000055		0.000006		0.000006
Co [mg/L]		0.000067		0.000020		0.000020		0.000005		0.000018
Cr [mg/L]		0.00069		0.00027		0.00027		< 0.00008		0.00034
Cu [mg/L]		0.0004		< 0.0002		0.0002		< 0.0002		0.0004
Fe [mg/L]		0.167		0.013		0.012		< 0.007		0.103
K [mg/L]		2.40		2.48		2.26		5.71		4.79
Li [mg/L]		0.0004		0.0001		< 0.0001		0.0002		0.0003
Mg [mg/L]		0.450		1.11		0.421		0.565		0.437
Mn [mg/L]		0.00333		0.00342		0.00173		0.00104		0.00132
Mo [mg/L]		0.00039		0.00042		0.00030		0.00051		0.00474
Na [mg/L]		17.0		7.31		7.86		7.19		14.3
Ni [mg/L]		0.0002		0.0001		< 0.0001		< 0.0001		0.0001
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		0.00031
Sb [mg/L]		0.0012		0.0014		< 0.0009		< 0.0009		0.0010
Se [mg/L]		0.00079		0.00082		0.00078		0.00015		0.00018
Si [mg/L]		2.77		1.34		2.16		2.34		2.23
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]		0.0109		0.0182		0.0167		0.0617		0.0154
Ti [mg/L]		0.00512		0.00097		0.00093		0.00016		0.00144
Tl [mg/L]		0.000006		< 0.000005		< 0.000005		< 0.000005		< 0.000005
U [mg/L]		0.000822		0.000048		0.000143		0.000485		0.000153
V [mg/L]		0.00759		0.00094		0.00245		0.00695		0.00138
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	60: 986301	61: 986527	62: 976319	63: 986619	64: 987176	65: 167317	66: 168506	67: 182574	68: 961457	69: 961744
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.31		9.21		9.29		8.86		9.18
pH [No unit]		8.40		8.36		8.50		7.93		9.38
Conductivity [uS/cm]		99		130		99		152		117
Alkalinity [mg/L as CaCO3]		38		39		38		49		46
SO4 [mg/L]		5		21		4		17		3
F [mg/L]		0.07		0.08		0.09		0.13		0.17
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		0.904		0.729		1.36		0.743		0.400
As [mg/L]		0.0014		0.0007		0.0006		0.0005		0.0020
Ba [mg/L]		0.02190		0.223		0.00199		0.00191		0.00180
B [mg/L]		0.010		0.006		0.009		0.093		0.090

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Analysis	60: 986301	61: 986527	62: 976319	63: 986619	64: 987176	65: 167317	66: 168506	67: 182574	68: 961457	69: 961744
Be [mg/L]		< 0.000007		< 0.000007		0.000027		0.000016		0.000026
Bi [mg/L]		< 0.00001		< 0.00001		< 0.00001		< 0.00001		0.00001
Ca [mg/L]		7.03		14.6		10.0		17.2		6.72
Cd [mg/L]		< 0.000003		0.000025		0.000034		< 0.000003		0.000021
Co [mg/L]		< 0.000004		0.000008		0.000009		0.000015		0.000022
Cr [mg/L]		0.00010		0.00015		0.00022		0.00019		0.00049
Cu [mg/L]		< 0.0002		0.0002		0.0004		0.0003		0.0009
Fe [mg/L]		< 0.007		< 0.007		0.013		< 0.007		0.105
K [mg/L]		5.35		7.12		2.48		6.18		6.80
Li [mg/L]		0.0005		0.0003		0.0001		0.0003		0.0003
Mg [mg/L]		0.990		1.68		0.572		2.02		0.500
Mn [mg/L]		0.00171		0.00246		0.00151		0.00862		0.00399
Mo [mg/L]		0.00024		0.00031		0.00036		0.00327		0.00235
Na [mg/L]		9.73		8.23		9.39		6.00		14.0
Ni [mg/L]		< 0.0001		< 0.0001		< 0.0001		0.0001		0.0001
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		0.00118
Sb [mg/L]		< 0.0009		< 0.0009		< 0.0009		0.0038		< 0.0009
Se [mg/L]		0.00005		0.00025		0.00061		0.00017		0.00029
Si [mg/L]		1.86		1.72		1.58		1.41		2.42
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]		0.128		1.80		0.0294		0.0294		0.00910
Ti [mg/L]		0.00012		0.00041		0.00093		< 0.00005		0.00212
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		< 0.000005
U [mg/L]		0.000327		0.000180		0.000062		0.000214		0.000189
V [mg/L]		0.00471		0.00288		0.00149		0.00073		0.00192
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	70: 962052	71: 966413	72: 953697	73: 982894	74: 954236	75: 954535	76: 954874	77: 955411	78: 993558	79: 993900
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.17		9.15		9.24		9.43		9.16
pH [No unit]		9.33		7.96		9.11		9.12		7.79
Conductivity [uS/cm]		128		100		112		104		100
Alkalinity [mg/L as CaCO3]		45		37		36		39		34
SO4 [mg/L]		11		6		4		3		5
F [mg/L]		0.16		< 0.06		0.08		< 0.06		< 0.06
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		0.00002		< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		0.311		0.733		0.660		0.792		0.702
As [mg/L]		0.0025		0.0007		0.0011		0.0010		0.0012
Ba [mg/L]		0.00288		0.00057		0.00250		0.00173		0.00064
B [mg/L]		0.107		0.048		0.084		0.083		0.041
Be [mg/L]		< 0.000007		0.000031		< 0.000007		0.000022		0.000034
Bi [mg/L]		0.00002		0.00002		0.00055		0.00083		0.00002
Ca [mg/L]		7.72		11.3		8.27		8.20		10.5
Cd [mg/L]		0.000004		0.000004		0.000008		0.000005		0.000006
Co [mg/L]		0.000021		< 0.000004		0.000022		0.000028		0.000018

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Analysis	70: 962052	71: 966413	72: 953697	73: 982894	74: 954236	75: 954535	76: 954874	77: 955411	78: 993558	79: 993900
Cr [mg/L]		0.00054		0.00010		0.00032		0.00052		0.00011
Cu [mg/L]		0.0004		< 0.0002		0.0005		0.0008		0.0003
Fe [mg/L]		0.046		< 0.007		0.166		0.201		0.018
K [mg/L]		2.78		1.14		1.39		0.325		2.65
Li [mg/L]		0.0004		0.0001		0.0003		0.0004		< 0.0001
Mg [mg/L]		0.689		0.586		0.371		0.253		0.445
Mn [mg/L]		0.00107		0.00261		0.00415		0.02341		0.00310
Mo [mg/L]		0.00103		0.00127		0.00188		0.00623		0.00072
Na [mg/L]		17.1		5.56		12.3		16.0		7.77
Ni [mg/L]		0.0001		< 0.0001		< 0.0001		0.0001		< 0.0001
Pb [mg/L]		< 0.00009		< 0.00009		0.00041		0.00093		< 0.00009
Sb [mg/L]		0.0017		0.0045		0.0013		< 0.0009		0.0019
Se [mg/L]		0.00032		0.00016		0.00018		0.00015		0.00027
Si [mg/L]		2.35		1.89		3.38		5.81		2.56
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		0.00006		< 0.00006
Sr [mg/L]		0.0219		0.0342		0.0149		0.0137		0.0172
Ti [mg/L]		0.00112		0.00014		0.01078		0.01211		0.00075
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		0.000005
U [mg/L]		0.000098		0.000158		0.000083		0.000170		0.000212
V [mg/L]		0.00324		0.00120		0.00158		0.00109		0.00155
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	80: 977243	81: 977550	82: 987879	83: 959394	84: 988032	85: 977937	86: 978315	87: 1023510	88: 1006148	89: 1006508
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		8.95		8.99		7.85		9.01		9.32
pH [No unit]		7.94		8.05		7.78		7.81		7.81
Conductivity [uS/cm]		120		101		365		115		78
Alkalinity [mg/L as CaCO3]		34		31		59		35		31
SO4 [mg/L]		7		9		85		8		2
F [mg/L]		< 0.06		< 0.06		0.09		< 0.06		< 0.06
Hg [mg/L]		0.00001		0.00001		0.00004		< 0.00001		< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		0.00008		< 0.00005		< 0.00005
Al [mg/L]		0.603		0.665		0.087		0.826		0.566
As [mg/L]		0.0019		0.0017		< 0.0002		0.0012		0.0021
Ba [mg/L]		0.00101		0.00141		0.00431		0.00102		0.00084
B [mg/L]		0.026		0.037		0.013		0.049		0.022
Be [mg/L]		0.000025		0.000040		0.000022		0.000030		< 0.000007
Bi [mg/L]		0.00002		0.00003		< 0.00001		0.00003		0.00005
Ca [mg/L]		13.9		13.6		57.7		14.1		8.23
Cd [mg/L]		0.000013		0.000150		0.000014		0.000059		0.000007
Co [mg/L]		0.000019		0.000030		0.000305		0.000028		0.000011
Cr [mg/L]		0.00032		0.00035		< 0.00008		0.00030		< 0.00008
Cu [mg/L]		0.0003		< 0.0002		< 0.0002		0.0003		0.0003
Fe [mg/L]		0.012		0.010		< 0.007		0.017		0.049
K [mg/L]		2.20		2.72		8.12		3.01		1.85
Li [mg/L]		0.0001		0.0004		0.0003		0.0002		0.0001

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LR Report : **CA19148-AUG22**

Analysis	80: 977243	81: 977550	82: 987879	83: 959394	84: 988032	85: 977937	86: 978315	87: 1023510	88: 1006148	89: 1006508
Mg [mg/L]		0.742		0.650		0.993		0.636		0.312
Mn [mg/L]		0.00355		0.00663		0.320		0.00558		0.00256
Mo [mg/L]		0.00974		0.00681		0.00231		0.00191		0.00169
Na [mg/L]		8.72		4.69		8.98		6.73		5.85
Ni [mg/L]		0.0002		< 0.0001		0.0001		0.0001		< 0.0001
Pb [mg/L]		< 0.00009		0.00009		< 0.00009		< 0.00009		< 0.00009
Sb [mg/L]		0.0025		0.0015		0.0018		< 0.0009		0.0010
Se [mg/L]		0.00013		0.00129		0.00023		0.00076		0.00069
Si [mg/L]		1.98		2.24		1.75		1.99		3.28
Sn [mg/L]		< 0.00006		< 0.00006		0.00030		< 0.00006		< 0.00006
Sr [mg/L]		0.0220		0.0204		0.0624		0.0234		0.0216
Ti [mg/L]		0.00022		0.00224		0.00012		0.00126		0.00135
Tl [mg/L]		0.000005		0.000010		0.000006		< 0.000005		< 0.000005
U [mg/L]		0.000168		0.000160		0.000394		0.000314		0.000469
V [mg/L]		0.00142		0.00107		0.00002		0.00170		0.00177
Zn [mg/L]		< 0.002		0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	90: 1024643	91: 1006790	92: 954411	93: 1024043	94: 1024143	95: 1014178	96: 1014138	97: 1014189	98: 1007031	99: 1007347
Sample Date & Time		N/A		N/A		N/A				N/A
Sample weight [g]		250		250		250				250
Volume D.I. Water [mL]		750		750		750				750
Final pH [no unit]		9.26		9.39		9.18				9.20
pH [No unit]		7.77		7.88		7.76				7.79
Conductivity [uS/cm]		88		86		97				102
Alkalinity [mg/L as CaCO3]		32		35		33				31
SO4 [mg/L]		4		< 2		4				10
F [mg/L]		< 0.06		< 0.06		< 0.06				0.06
Hg [mg/L]		0.00001		< 0.00001		< 0.00001				< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005				< 0.00005
Al [mg/L]		0.599		1.19		0.825				0.848
As [mg/L]		0.0013		0.0011		0.0011				0.0014
Ba [mg/L]		0.00203		0.00062		0.00075				0.00069
B [mg/L]		0.147		0.014		0.031				0.020
Be [mg/L]		0.000030		0.000024		0.000019				0.000019
Bi [mg/L]		0.00001		< 0.00001		< 0.00001				< 0.00001
Ca [mg/L]		11.8		8.16		10.8				11.1
Cd [mg/L]		0.000006		< 0.000003		< 0.000003				< 0.000003
Co [mg/L]		0.000018		< 0.000004		0.000005				0.000011
Cr [mg/L]		< 0.00008		< 0.00008		< 0.00008				< 0.00008
Cu [mg/L]		< 0.0002		< 0.0002		< 0.0002				0.0002
Fe [mg/L]		0.010		0.014		0.007				0.016
K [mg/L]		2.14		4.95		2.16				2.50
Li [mg/L]		0.0003		< 0.0001		0.0001				0.0003
Mg [mg/L]		0.590		0.473		0.777				0.470
Mn [mg/L]		0.00504		0.00153		0.00303				0.00229
Mo [mg/L]		0.00760		0.00066		0.00255				0.00295
Na [mg/L]		7.98		8.34		7.09				7.68
Ni [mg/L]		< 0.0001		< 0.0001		< 0.0001				< 0.0001

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LR Report : **CA19148-AUG22**

Analysis	90: 1024643	91: 1006790	92: 954411	93: 1024043	94: 1024143	95: 1014178	96: 1014138	97: 1014189	98: 1007031	99: 1007347
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009				< 0.00009
Sb [mg/L]		0.0012		< 0.0009		0.0015				0.0014
Se [mg/L]		0.00014		0.00020		0.00011				0.00008
Si [mg/L]		2.07		1.85		1.81				1.80
Sn [mg/L]		0.00008		< 0.00006		< 0.00006				< 0.00006
Sr [mg/L]		0.0601		0.0208		0.0302				0.0314
Ti [mg/L]		0.00048		0.00024		0.00011				0.00031
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005				0.000005
U [mg/L]		0.000132		0.000116		0.000131				0.000171
V [mg/L]		0.00166		0.00192		0.00139				0.00128
Zn [mg/L]		< 0.002		< 0.002		< 0.002				< 0.002
pH Check <2 [pH]		1.00		1.00		1.00				1.00

Analysis	100: 1016824	101: 1007426	102: 1015017	103: 1025702	104: 1026178	105: 1026138	106: 1026408	107: 1008488	108: 1008340	109: 1008876
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		8.86		9.46		9.19		9.32		9.41
pH [No unit]		7.78		8.35		8.00		8.06		8.17
Conductivity [uS/cm]		131		66		85		86		87
Alkalinity [mg/L as CaCO3]		37		32		35		32		32
SO4 [mg/L]		14		< 2		< 2		4		3
F [mg/L]		0.10		< 0.06		0.07		< 0.06		0.09
Hg [mg/L]		< 0.00001		0.00002		< 0.00001		< 0.00001		0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		0.783		1.12		0.557		1.09		1.02
As [mg/L]		0.0004		0.0005		0.0009		0.0017		0.0036
Ba [mg/L]		0.00106		0.00055		0.00030		0.00083		0.00084
B [mg/L]		0.045		0.009		0.006		0.037		0.048
Be [mg/L]		0.000015		0.000021		0.000017		0.000024		0.000019
Bi [mg/L]		< 0.00001		< 0.00001		0.00001		0.00001		0.00019
Ca [mg/L]		16.5		7.07		8.83		9.56		7.53
Cd [mg/L]		< 0.000003		< 0.000003		< 0.000003		< 0.000003		0.000003
Co [mg/L]		0.000015		< 0.000004		0.000018		0.000004		0.000012
Cr [mg/L]		0.00009		< 0.00008		0.00009		< 0.00008		< 0.00008
Cu [mg/L]		0.0002		< 0.0002		0.0010		0.0002		0.0003
Fe [mg/L]		0.011		0.013		0.047		0.011		0.023
K [mg/L]		4.54		2.51		1.43		2.48		5.80
Li [mg/L]		0.0006		0.0001		0.0001		0.0001		0.0001
Mg [mg/L]		0.795		0.447		0.591		0.514		0.446
Mn [mg/L]		0.00601		0.00094		0.00486		0.00160		0.00209
Mo [mg/L]		0.00058		0.00023		0.00183		0.00865		0.00337
Na [mg/L]		8.54		6.19		10.9		9.38		7.45
Ni [mg/L]		< 0.0001		< 0.0001		0.0001		< 0.0001		< 0.0001
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		< 0.00009
Sb [mg/L]		0.0023		< 0.0009		< 0.0009		0.0017		0.0089
Se [mg/L]		0.00011		< 0.00004		0.00026		0.00023		0.00008
Si [mg/L]		1.37		1.94		3.31		1.66		2.11
Sn [mg/L]		0.00007		< 0.00006		< 0.00006		< 0.00006		< 0.00006

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LR Report : **CA19148-AUG22**

Analysis	100: 1016824	101: 1007426	102: 1015017	103: 1025702	104: 1026178	105: 1026138	106: 1026408	107: 1008488	108: 1008340	109: 1008876
Sr [mg/L]		0.0322		0.0241		0.0124		0.0327		0.0328
Ti [mg/L]		0.00022		0.00018		0.00085		0.00024		0.00051
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		0.000005
U [mg/L]		0.000114		0.000071		0.000314		0.000128		0.000267
V [mg/L]		0.00049		0.00262		0.00170		0.00164		0.00272
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	110: 1009326	111: 1027298	112: 1027382	113: 1009713	114: 1043650	115: 1044017	116: 1044097	117: 996541	118: 989877	119: 973322
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.49		9.12		8.72		9.23		9.01
pH [No unit]		8.35		8.04		7.66		7.75		7.53
Conductivity [uS/cm]		72		92		124		91		110
Alkalinity [mg/L as CaCO3]		31		33		32		32		29
SO4 [mg/L]		< 2		5		16		3		12
F [mg/L]		< 0.06		0.15		< 0.06		< 0.06		< 0.06
Hg [mg/L]		< 0.00001		< 0.00001		< 0.00001		0.00001		0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		0.958		0.773		0.950		1.31		0.612
As [mg/L]		0.0011		0.0017		0.0008		0.0018		0.0037
Ba [mg/L]		0.00032		0.00102		0.00112		0.00073		0.00116
B [mg/L]		0.012		0.014		0.025		0.033		0.028
Be [mg/L]		< 0.000007		< 0.000007		< 0.000007		< 0.000007		< 0.000007
Bi [mg/L]		0.00003		< 0.00001		< 0.00001		0.00005		0.00001
Ca [mg/L]		8.34		8.80		14.8		10.2		12.7
Cd [mg/L]		< 0.000003		< 0.000003		< 0.000003		< 0.000003		0.000020
Co [mg/L]		0.000004		0.000015		0.000013		0.000021		0.000014
Cr [mg/L]		0.00009		0.00015		< 0.00008		< 0.00008		< 0.00008
Cu [mg/L]		< 0.0002		< 0.0002		0.0003		0.0003		0.0002
Fe [mg/L]		0.021		0.015		0.012		0.023		0.013
K [mg/L]		1.52		4.69		3.09		3.49		2.65
Li [mg/L]		< 0.0001		0.0002		0.0002		0.0001		0.0002
Mg [mg/L]		0.444		0.610		0.851		0.637		0.615
Mn [mg/L]		0.00118		0.00154		0.00273		0.00210		0.00337
Mo [mg/L]		0.00043		0.00130		0.01022		0.00030		0.04788
Na [mg/L]		6.35		12.4		6.61		8.19		7.23
Ni [mg/L]		< 0.0001		< 0.0001		< 0.0001		< 0.0001		< 0.0001
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		0.00026		< 0.00009
Sb [mg/L]		< 0.0009		0.0013		0.0021		< 0.0009		0.0024
Se [mg/L]		0.00007		0.00008		0.00012		0.00009		0.00032
Si [mg/L]		2.19		2.00		1.00		1.71		1.54
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]		0.00928		0.0512		0.0173		0.0214		0.0307
Ti [mg/L]		0.00068		0.00037		0.00026		0.00046		0.00062
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		0.000007
U [mg/L]		0.000216		0.000189		0.000041		0.000068		0.000233
V [mg/L]		0.00180		0.00320		0.00044		0.00368		0.00124

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LR Report : **CA19148-AUG22**

Analysis	110: 1009326	111: 1027298	112: 1027382	113: 1009713	114: 1043650	115: 1044017	116: 1044097	117: 996541	118: 989877	119: 973322
Zn [mg/L]		< 0.002		< 0.002		< 0.002		0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

Analysis	120: 956379	121: 956542	122: 984474	123: 957562	124: 957928	125: 958200	126: 986925	127: 182172	128: 991156	129: 1009992
Sample Date & Time		N/A		N/A		N/A		N/A		N/A
Sample weight [g]		250		250		250		250		250
Volume D.I. Water [mL]		750		750		750		750		750
Final pH [no unit]		9.10		9.25		9.18		9.43		9.21
pH [No unit]		7.68		7.74		7.73		7.75		7.65
Conductivity [uS/cm]		114		77		78		88		111
Alkalinity [mg/L as CaCO3]		32		34		32		35		34
SO4 [mg/L]		10		2		< 2		< 2		9
F [mg/L]		< 0.06		0.16		0.10		0.09		< 0.06
Hg [mg/L]		0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005
Al [mg/L]		0.773		0.871		0.870		1.06		0.832
As [mg/L]		0.0017		0.0007		0.0007		0.0058		0.0045
Ba [mg/L]		0.00177		0.00076		0.00087		0.00108		0.00135
B [mg/L]		0.075		0.011		0.062		0.020		0.043
Be [mg/L]		< 0.000007		< 0.000007		< 0.000007		< 0.000007		0.000007
Bi [mg/L]		0.00005		< 0.00001		0.00003		< 0.00001		0.00001
Ca [mg/L]		11.2		7.57		8.46		6.67		11.4
Cd [mg/L]		< 0.000003		0.000004		< 0.000003		0.000004		0.000013
Co [mg/L]		0.000010		0.000019		0.000006		0.000067		0.000038
Cr [mg/L]		0.00017		< 0.00008		< 0.00008		< 0.00008		0.00010
Cu [mg/L]		0.0002		< 0.0002		< 0.0002		0.0008		0.0005
Fe [mg/L]		0.012		< 0.007		< 0.007		0.055		0.027
K [mg/L]		5.23		2.22		1.70		4.57		4.81
Li [mg/L]		0.0001		< 0.0001		0.0001		0.0109		0.0005
Mg [mg/L]		0.902		0.911		1.11		0.569		0.631
Mn [mg/L]		0.00462		0.00097		0.00135		0.00336		0.00356
Mo [mg/L]		0.00136		0.00110		0.00197		0.00055		0.00557
Na [mg/L]		5.69		5.42		4.23		7.74		5.83
Ni [mg/L]		0.0002		< 0.0001		< 0.0001		0.0003		0.0002
Pb [mg/L]		< 0.00009		< 0.00009		< 0.00009		< 0.00009		< 0.00009
Sb [mg/L]		0.0011		< 0.0009		< 0.0009		< 0.0009		0.0020
Se [mg/L]		0.00036		0.00009		< 0.00004		0.00005		0.00019
Si [mg/L]		1.24		0.75		0.83		2.10		1.62
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006
Sr [mg/L]		0.0296		0.0182		0.0249		0.0160		0.0486
Ti [mg/L]		0.00061		0.00010		0.00013		0.00235		0.00143
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005		0.000006
U [mg/L]		0.000130		0.000016		0.000008		0.000253		0.000170
V [mg/L]		0.00196		0.00194		0.00061		0.00288		0.00216
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002		< 0.002
pH Check <2 [pH]		1.00		1.00		1.00		1.00		1.00

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LR Report : **CA19148-AUG22**

Analysis	130: 1010237	131: 989779	132: 955824	133: 955884	134: 1006198	135: 1010388	136: 1010413	137: 1010700	138: 1006857	139: 1010941
Sample Date & Time	N/A		N/A		N/A		N/A		N/A	
Sample weight [g]	250		250		250		250		250	
Volume D.I. Water [mL]	750		750		750		750		750	
Final pH [no unit]	9.41		9.41		9.14		9.15		9.00	
pH [No unit]	7.75		7.76		7.67		7.76		7.68	
Conductivity [uS/cm]	75		80		99		105		137	
Alkalinity [mg/L as CaCO3]	31		33		31		35		36	
SO4 [mg/L]	3		3		8		7		17	
F [mg/L]	< 0.06		0.06		< 0.06		< 0.06		0.07	
Hg [mg/L]	< 0.00001		0.00002		< 0.00001		< 0.00001		< 0.00001	
Ag [mg/L]	< 0.00005		< 0.00005		< 0.00005		< 0.00005		< 0.00005	
Al [mg/L]	1.10		1.03		0.799		0.974		0.622	
As [mg/L]	0.0005		0.0009		0.0005		0.0019		0.0013	
Ba [mg/L]	0.00044		0.00055		0.00125		0.00120		0.00175	
B [mg/L]	0.033		0.019		0.057		0.017		0.022	
Be [mg/L]	< 0.000007		< 0.000007		0.000007		0.000012		< 0.000007	
Bi [mg/L]	< 0.00001		< 0.00001		0.00003		< 0.00001		0.00002	
Ca [mg/L]	7.31		7.67		11.8		9.82		15.0	
Cd [mg/L]	0.000004		0.000005		< 0.000003		0.000006		0.000009	
Co [mg/L]	0.000008		0.000018		0.000022		0.000017		0.000022	
Cr [mg/L]	< 0.00008		< 0.00008		< 0.00008		< 0.00008		< 0.00008	
Cu [mg/L]	< 0.0002		0.0005		< 0.0002		0.0003		0.0003	
Fe [mg/L]	0.011		0.020		< 0.007		0.012		0.021	
K [mg/L]	2.47		3.03		1.80		4.78		4.72	
Li [mg/L]	0.0007		0.0001		0.0004		0.0003		0.0003	
Mg [mg/L]	0.401		0.686		0.796		0.554		1.32	
Mn [mg/L]	0.00211		0.00325		0.00460		0.00432		0.00294	
Mo [mg/L]	0.00030		0.00050		0.00039		0.00521		0.01285	
Na [mg/L]	6.02		9.01		6.29		7.86		6.83	
Ni [mg/L]	< 0.0001		< 0.0001		< 0.0001		0.0002		0.0003	
Pb [mg/L]	< 0.00009		< 0.00009		< 0.00009		< 0.00009		< 0.00009	
Sb [mg/L]	< 0.0009		< 0.0009		0.0028		0.0017		0.0071	
Se [mg/L]	0.00010		< 0.00004		0.00007		0.00019		0.00010	
Si [mg/L]	1.28		2.04		1.48		0.84		1.44	
Sn [mg/L]	< 0.00006		< 0.00006		< 0.00006		< 0.00006		< 0.00006	
Sr [mg/L]	0.0132		0.0270		0.0529		0.0498		0.108	
Ti [mg/L]	0.00053		0.00045		0.00021		0.00024		0.00030	
Tl [mg/L]	< 0.000005		< 0.000005		< 0.000005		< 0.000005		0.000013	
U [mg/L]	0.000050		0.000095		0.000056		0.000701		0.000390	
V [mg/L]	0.00224		0.00260		0.00112		0.00186		0.00122	
Zn [mg/L]	< 0.002		< 0.002		< 0.002		< 0.002		< 0.002	
pH Check <2 [pH]	1.00		1.00		1.00		1.00		1.00	

Analysis	140: 1018771	141: 1011231	142: 1019658	143: 1019827	144: 1011905	145: 1020450	146: 1021458	147: 1022334	148: 1022283
Sample Date & Time		N/A		N/A		N/A		N/A	
Sample weight [g]		250		250		250		250	
Volume D.I. Water [mL]		750		750		750		750	
Final pH [no unit]		9.12		8.91		8.96		9.21	
pH [No unit]		7.65		7.67		7.66		7.68	

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LR Report : **CA19148-AUG22**

Analysis	140: 1018771	141: 1011231	142: 1019658	143: 1019827	144: 1011905	145: 1020450	146: 1021458	147: 1022334	148: 1022283
Conductivity [uS/cm]		125		142		113		94	
Alkalinity [mg/L as CaCO3]		34		33		32		32	
SO4 [mg/L]		8		23		13		6	
F [mg/L]		< 0.06		0.13		0.07		< 0.06	
Hg [mg/L]		0.00002		0.00001		< 0.00001		< 0.00001	
Ag [mg/L]		< 0.00005		< 0.00005		< 0.00005		< 0.00005	
Al [mg/L]		0.487		0.698		0.883		0.943	
As [mg/L]		0.0009		0.0008		0.0017		0.0010	
Ba [mg/L]		0.00070		0.00100		0.00089		0.00073	
B [mg/L]		0.084		0.038		0.010		0.028	
Be [mg/L]		0.000008		< 0.000007		< 0.000007		< 0.000007	
Bi [mg/L]		0.00002		< 0.00001		0.00007		0.00002	
Ca [mg/L]		13.6		15.3		11.3		9.44	
Cd [mg/L]		0.000007		0.000015		0.000008		0.000004	
Co [mg/L]		0.000049		0.000034		0.000034		0.000054	
Cr [mg/L]		< 0.00008		< 0.00008		< 0.00008		< 0.00008	
Cu [mg/L]		0.0003		0.0002		0.0005		0.0003	
Fe [mg/L]		0.013		0.168		0.025		0.027	
K [mg/L]		1.35		2.35		2.09		2.72	
Li [mg/L]		0.0002		0.0004		0.0004		0.0001	
Mg [mg/L]		0.918		1.20		0.495		0.475	
Mn [mg/L]		0.00873		0.00510		0.00799		0.00283	
Mo [mg/L]		0.00158		0.00710		0.00063		0.00913	
Na [mg/L]		7.69		7.57		8.16		5.49	
Ni [mg/L]		0.0002		0.0003		0.0003		0.0003	
Pb [mg/L]		0.00012		< 0.00009		0.00036		< 0.00009	
Sb [mg/L]		0.0013		0.0017		0.0021		< 0.0009	
Se [mg/L]		0.00010		0.00019		0.00033		0.00013	
Si [mg/L]		1.30		0.72		0.97		0.94	
Sn [mg/L]		< 0.00006		< 0.00006		< 0.00006		< 0.00006	
Sr [mg/L]		0.0491		0.0516		0.0311		0.0226	
Ti [mg/L]		0.00027		0.00027		0.00084		0.00159	
Tl [mg/L]		< 0.000005		< 0.000005		< 0.000005		< 0.000005	
U [mg/L]		0.000418		0.001436		0.000182		0.000073	
V [mg/L]		0.00108		0.00029		0.00090		0.00131	
Zn [mg/L]		< 0.002		< 0.002		< 0.002		< 0.002	
pH Check <2 [pH]		1.00		1.00		1.00		1.00	

Analysis	149: 1030811	150: 1042567	151: 1048365	152: 996297	153: 956228	154: 956284	155: 957775	156: 986388	157: 1023762
Sample Date & Time	N/A		N/A		N/A		N/A		
Sample weight [g]	250		250		250		250		250
Volume D.I. Water [mL]	750		750		750		750		750
Final pH [no unit]	8.16		9.01		9.54		8.99		9.37
pH [No unit]	7.81		7.73		7.72		7.79		8.73
Conductivity [uS/cm]	339		123		72		146		90
Alkalinity [mg/L as CaCO3]	53		33		29		37		36
SO4 [mg/L]	77		16		< 2		19		3
F [mg/L]	< 0.06		0.09		< 0.06		0.11		0.11
Hg [mg/L]	0.00001		< 0.00001		< 0.00001		< 0.00001		< 0.00001

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LR Report : **CA19148-AUG22**

Analysis	149: 1030811	150: 1042567	151: 1048365	152: 996297	153: 956228	154: 956284	155: 957775	156: 986388	157: 1023762
Ag [mg/L]	0.00037	< 0.00005	< 0.00005	< 0.00005	< 0.00005				
Al [mg/L]	0.201	0.882	0.912	1.02	0.908				
As [mg/L]	< 0.0002	0.0058	0.0008	0.0007	0.0064				
Ba [mg/L]	0.00206	0.00106	0.00084	0.00096	0.00194				
B [mg/L]	0.009	0.017	0.012	0.032	0.009				
Be [mg/L]	< 0.000007	< 0.000007	0.000007	< 0.000007	< 0.000007				
Bi [mg/L]	< 0.00001	< 0.00001	0.00002	< 0.00001	< 0.00001				
Ca [mg/L]	52.3	12.2	5.44	13.8	6.22				
Cd [mg/L]	0.000003	0.000014	0.000003	0.000003	< 0.000003				
Co [mg/L]	0.000147	0.000036	0.000028	0.000093	< 0.000004				
Cr [mg/L]	0.00011	< 0.00008	0.00008	< 0.00008	0.00022				
Cu [mg/L]	< 0.0002	0.0002	0.0004	< 0.0002	0.0003				
Fe [mg/L]	< 0.007	0.022	0.099	0.008	< 0.007				
K [mg/L]	1.09	3.63	1.22	5.29	7.58				
Li [mg/L]	0.0004	0.0003	0.0001	0.0002	0.0003				
Mg [mg/L]	2.28	0.744	0.380	0.889	0.541				
Mn [mg/L]	0.03679	0.00327	0.00466	0.00413	0.00115				
Mo [mg/L]	0.00105	0.03750	0.00072	0.00177	0.00021				
Na [mg/L]	6.74	6.84	6.71	8.31	12.6				
Ni [mg/L]	0.0002	0.0002	0.0004	< 0.0001	< 0.0001				
Pb [mg/L]	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009				
Sb [mg/L]	0.0014	0.0029	< 0.0009	< 0.0009	< 0.0009				
Se [mg/L]	0.00028	0.00018	0.00005	0.00014	0.00017				
Si [mg/L]	0.70	1.07	2.78	0.64	2.09				
Sn [mg/L]	< 0.00006	< 0.00006	< 0.00006	< 0.00006	0.00006				
Sr [mg/L]	0.0939	0.0533	0.0122	0.0421	0.0605				
Ti [mg/L]	0.00008	0.00177	0.00343	0.00028	0.00008				
Tl [mg/L]	< 0.000005	0.000005	< 0.000005	< 0.000005	< 0.000005				
U [mg/L]	0.000130	0.000087	0.000049	0.000114	0.000279				
V [mg/L]	0.00003	0.00134	0.00146	0.00059	0.00887				
Zn [mg/L]	< 0.002	0.003	< 0.002	< 0.002	< 0.002				
pH Check <2 [pH]	1.00	1.00	1.00	1.00	1.00				

Analysis	158: 955411	159:BLK: $D.I. Leachate Blank	160:BLK: $D.I. Leachate Blank	161: 1025702	162: 957775	163: 958200
Sample Date & Time						
Sample weight [g]	250	---	---	250	250	250
Volume D.I. Water [mL]	750	750	750	750	750	750
Final pH [no unit]	9.39	5.61	5.61	9.41	9.01	9.21
pH [No unit]	8.78	5.60	5.82	8.61	7.78	7.75
Conductivity [uS/cm]	104	< 2	< 2	59	141	79
Alkalinity [mg/L as CaCO3]	38	< 2	< 2	31	37	32
SO4 [mg/L]	4	< 2	< 2	< 2	17	< 2
F [mg/L]	< 0.06	< 0.06	< 0.06	< 0.06	0.10	0.08
Hg [mg/L]	< 0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	0.607	0.001	0.003	1.10	1.06	0.922
As [mg/L]	0.0010	< 0.0002	< 0.0002	0.0006	0.0007	0.0007
Ba [mg/L]	0.00148	< 0.00008	< 0.00008	0.00054	0.00092	0.00076
B [mg/L]	0.080	< 0.002	< 0.002	0.009	0.028	0.059

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LR Report : **CA19148-AUG22**

Analysis	158: 955411	159:BLK: $D.I. Leachate Blank	160:BLK: $D.I. Leachate Blank	161: 1025702	162: 957775	163: 958200
Be [mg/L]	0.000018	0.000009	< 0.000007	< 0.000007	< 0.000007	0.000008
Bi [mg/L]	0.00063	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00003
Ca [mg/L]	7.99	0.02	0.02	6.69	13.8	8.44
Cd [mg/L]	0.000003	< 0.000003	< 0.000003	< 0.000003	0.000009	0.000009
Co [mg/L]	0.000018	0.000008	0.000005	< 0.000004	0.000027	0.000010
Cr [mg/L]	0.00031	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	0.0008	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0004
Fe [mg/L]	0.138	< 0.007	< 0.007	0.013	< 0.007	< 0.007
K [mg/L]	0.344	0.029	0.046	2.42	5.57	1.74
Li [mg/L]	0.0003	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001
Mg [mg/L]	0.238	0.002	0.003	0.417	0.882	1.06
Mn [mg/L]	0.0159	0.00024	0.00021	0.00094	0.00423	0.00157
Mo [mg/L]	0.00589	< 0.00004	< 0.00004	0.00018	0.00153	0.00209
Na [mg/L]	14.6	4.00	0.32	6.33	7.68	3.97
Ni [mg/L]	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002
Pb [mg/L]	0.00066	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	0.00010	< 0.00004	< 0.00004	0.00005	0.00010	0.00010
Si [mg/L]	5.18	< 0.02	< 0.02	1.85	0.76	0.84
Sn [mg/L]	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006
Sr [mg/L]	0.0132	< 0.00008	< 0.00008	0.0232	0.0428	0.0245
Ti [mg/L]	0.00873	< 0.00005	< 0.00005	0.00023	0.00015	0.00012
Tl [mg/L]	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	0.000165	< 0.000002	< 0.000002	0.000067	0.000098	0.000008
V [mg/L]	0.00113	< 0.00001	< 0.00001	0.00268	0.00056	0.00062
Zn [mg/L]	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
pH Check <2 [pH]	1.00	1.00	1.00	1.00	1.00	1.00

<original signed by>

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

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13-October-2022

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 24 August 2022
LR Report: **CA19146-AUG22**

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: 166984	6: 167102	7: 167386	8: 168445
Sample Date & Time					N/A	N/A	N/A	N/A
Paste pH [no unit]	23-Sep-22	09:00	26-Sep-22	15:02	9.41	9.78	9.38	9.68
Fizz Rate [rating]	23-Sep-22	09:00	26-Sep-22	15:02	4	4	4	4
Sample weight [g]	23-Sep-22	09:00	26-Sep-22	15:02	2.00	1.99	2.02	2.00
HCl_add [mL]	24-Sep-22	06:46	26-Sep-22	15:02	65.00	80.00	80.00	75.00
HCl [Normality]	23-Sep-22	09:00	26-Sep-22	15:02	0.10	0.10	0.10	0.10
NaOH [Normality]	23-Sep-22	09:00	26-Sep-22	15:02	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	24-Sep-22	09:00	26-Sep-22	15:02	19.56	25.07	22.14	22.81
Final pH [no unit]	24-Sep-22	09:00	26-Sep-22	15:02	1.77	1.81	1.77	1.76
NP [t CaCO3/1000 t]	24-Sep-22	09:00	26-Sep-22	15:02	114	138	143	130
AP [t CaCO3/1000 t]	11-Oct-22	15:00	11-Oct-22	15:03	1.25	1.25	1.56	1.25
Net NP [t CaCO3/1000 t]	11-Oct-22	15:00	11-Oct-22	15:03	112	137	142	129
NP/AP [ratio]	11-Oct-22	15:00	11-Oct-22	15:03	90.9	110	91.6	104
S [%]	28-Sep-22	14:03	11-Oct-22	14:59	0.043	< 0.005	0.072	< 0.005
Acid Leachable SO4-S [%]	11-Oct-22	14:54	11-Oct-22	14:59	0.04	<0.04	< 0.04	<0.04
Sulphide [%]	Oct-07-22	08:24	11-Oct-22	14:59	< 0.04	< 0.04	0.05	< 0.04
C [%]	28-Sep-22	14:03	05-Oct-22	10:32	1.34	1.78	1.68	1.61
CO3 (HCl) as %CO3 [%]	03-Oct-22	16:04	05-Oct-22	10:32	6.45	8.76	8.22	7.85

Analysis	9: 168532	10: 168616	11: 169565	12: 934952	13: 935172	14: 937527	15: 939437	16: 939706	17: 960224	18: 960691
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.76	9.68	9.80	9.93	9.90	9.50	9.77	9.85	9.54	9.55
Fizz Rate [rating]	3	3	4	3	3	3	4	3	3	4
Sample weight [g]	2.00	2.00	2.01	1.99	1.99	1.99	2.02	2.01	2.02	2.00

OnLine LIMS

0003082164

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LR Report : **CA19146-AUG22**

Analysis	9: 168532	10: 168616	11: 169565	12: 934952	13: 935172	14: 937527	15: 939437	16: 939706	17: 960224	18: 960691
HCl_add [mL]	20.00	20.00	80.00	60.00	20.00	20.00	115.00	55.00	60.00	60.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	9.99	7.32	32.84	20.01	11.01	7.32	41.66	17.83	21.82	22.36
Final pH [no unit]	1.45	1.67	1.56	1.72	1.42	1.72	1.58	1.76	1.66	1.62
NP [t CaCO3/1000 t]	25.0	31.7	117	100	22.6	31.9	182	92.5	94.5	94.1
AP [t CaCO3/1000 t]	25.3	10.3	1.25	1.25	1.25	14.4	1.25	1.25	1.25	1.25
Net NP [t CaCO3/1000 t]	-0.31	21.4	116	99.2	21.4	17.5	180	91.2	93.2	92.8
NP/AP [ratio]	0.99	3.07	93.8	80.4	18.1	2.22	145	74.0	75.6	75.3
S [%]	0.963	0.426	< 0.005	< 0.005	< 0.005	0.692	< 0.005	< 0.005	0.028	< 0.005
Acid Leachable SO4-S [%]	0.15	0.10	<0.04	<0.04	<0.04	0.23	<0.04	<0.04	<0.04	<0.04
Sulphide [%]	0.81	0.33	< 0.04	< 0.04	< 0.04	0.46	< 0.04	< 0.04	< 0.04	< 0.04
C [%]	0.316	0.403	1.48	1.28	0.242	0.406	2.28	1.16	1.20	1.11
CO3 (HCl) as %CO3 [%]	1.43	1.84	7.27	6.27	1.00	1.86	11.3	5.68	5.84	5.38

Analysis	19: 960958	20: 963179	21: 963541	22: 964658	23: 965384	24: 965790	25: 965958	26: 966043	27: 966145	28: 966933
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.79	9.84	9.82	9.71	10.02	9.65	9.68	9.60	9.50	9.40
Fizz Rate [rating]	3	3	3	3	3	4	3	4	4	4
Sample weight [g]	2.03	1.98	1.99	2.00	2.01	1.99	1.99	2.00	2.02	2.02
HCl_add [mL]	20.00	40.00	25.00	30.00	80.00	80.00	30.00	115.00	65.00	60.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	7.96	10.83	10.21	11.35	27.53	35.73	10.79	42.00	15.17	18.76
Final pH [no unit]	1.70	1.89	1.58	1.73	1.70	1.55	1.74	1.54	1.75	1.74
NP [t CaCO3/1000 t]	29.6	73.7	37.2	46.6	130	111	48.3	182	123	102
AP [t CaCO3/1000 t]	1.25	1.25	1.25	4.06	1.25	1.25	1.25	1.25	3.12	1.25
Net NP [t CaCO3/1000 t]	28.4	72.4	36.0	42.5	129	110	47.0	181	120	101
NP/AP [ratio]	23.7	59.0	29.8	11.5	104	89.0	38.6	146	39.5	81.7
S [%]	0.044	< 0.005	0.050	0.228	< 0.005	< 0.005	< 0.005	< 0.005	0.126	< 0.005
Acid Leachable SO4-S [%]	0.04	<0.04	0.05	0.10	<0.04	<0.04	<0.04	<0.04	< 0.04	<0.04
Sulphide [%]	< 0.04	< 0.04	< 0.04	0.13	< 0.04	< 0.04	< 0.04	< 0.04	0.10	< 0.04
C [%]	0.391	0.893	0.418	0.536	1.85	1.48	0.656	2.13	1.37	1.23
CO3 (HCl) as %CO3 [%]	1.78	4.35	1.96	2.49	9.12	7.27	3.13	10.5	6.61	5.94

Analysis	29: 967212	30: 967393	31: 967524	32: 970453	33: 970578	34: 968738	35: 968928	36: 982589	37: 954284	38: 977884
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.66	9.77	9.75	9.74	9.86	9.61	9.48	9.59	9.79	9.41
Fizz Rate [rating]	4	4	3	3	3	4	4	3	4	2
Sample weight [g]	1.97	1.98	2.01	2.01	2.00	1.99	1.99	2.00	2.02	2.00

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LR Report : **CA19146-AUG22**

Analysis	29: 967212	30: 967393	31: 967524	32: 970453	33: 970578	34: 968738	35: 968928	36: 982589	37: 954284	38: 977884
HCl_add [mL]	75.00	40.00	25.00	50.00	65.00	40.00	60.00	30.00	85.00	20.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	21.61	19.44	10.72	19.49	24.27	19.31	21.62	12.93	34.92	15.71
Final pH [no unit]	1.54	1.50	1.57	1.65	1.63	1.51	1.67	1.52	1.55	1.32
NP [t CaCO3/1000 t]	136	51.9	35.5	75.9	102	52.0	96.4	42.7	124	10.7
AP [t CaCO3/1000 t]	1.25	1.25	1.25	1.25	1.25	9.06	1.25	6.88	1.25	1.25
Net NP [t CaCO3/1000 t]	134	50.6	34.2	74.6	101	42.9	95.2	35.8	123	9.45
NP/AP [ratio]	108	41.5	28.4	60.7	81.4	5.74	77.1	6.21	99.2	8.56
S [%]	< 0.005	0.030	0.035	0.008	< 0.005	0.363	< 0.005	0.345	< 0.005	0.012
Acid Leachable SO4-S [%]	<0.04	<0.04	<0.04	<0.04	<0.04	0.07	<0.04	0.12	<0.04	<0.04
Sulphide [%]	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	0.29	< 0.04	0.22	< 0.04	< 0.04
C [%]	1.42	0.626	0.416	0.985	1.32	0.588	1.23	0.498	1.58	0.106
CO3 (HCl) as %CO3 [%]	6.91	2.95	1.86	4.79	6.42	2.79	5.99	2.33	7.76	0.37

Analysis	39: 978133	40: 1023601	41: 1023762	42: 1023921	43: 1025383	44: 1015194	45: 1008325	46: 1008754	47: 1016750
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.65	9.41	9.40	9.37	9.67	9.24	9.58	9.53	9.51
Fizz Rate [rating]	3	4	4	4	4	3	4	4	3
Sample weight [g]	1.99	2.03	1.99	2.02	2.00	2.01	1.98	1.99	2.02
HCl_add [mL]	20.00	40.00	75.00	60.00	55.00	30.00	60.00	85.00	20.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	9.71	14.87	21.78	17.62	20.57	14.33	23.91	22.44	8.82
Final pH [no unit]	1.48	1.70	1.71	1.71	1.63	1.50	1.56	1.83	1.68
NP [t CaCO3/1000 t]	25.9	61.9	134	105	86.1	39.0	91.1	157	27.7
AP [t CaCO3/1000 t]	25.6	1.25	1.25	3.75	1.25	37.8	1.25	1.25	2.81
Net NP [t CaCO3/1000 t]	0.28	60.6	132	101	84.8	1.19	89.8	156	24.9
NP/AP [ratio]	1.01	49.5	107	28.0	68.9	1.03	72.9	126	9.85
S [%]	0.984	< 0.005	0.057	0.182	< 0.005	1.30	< 0.005	< 0.005	0.148
Acid Leachable SO4-S [%]	0.16	<0.04	0.06	0.06	<0.04	0.09	<0.04	<0.04	0.06
Sulphide [%]	0.82	< 0.04	< 0.04	0.12	< 0.04	1.21	< 0.04	< 0.04	0.09
C [%]	0.336	0.761	1.60	1.24	1.07	0.486	1.07	1.96	0.309
CO3 (HCl) as %CO3 [%]	1.50	3.66	7.76	6.04	5.21	2.26	5.14	9.59	1.37

Analysis	48: 1017129	49: 1009891	50: 1027447	51: 1027455	52: 1018430	53: 1011111	54: 1019798	55: 1011804	56: 995902
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	8.98	9.68	9.76	9.55	9.87	9.60	9.70	9.68	9.33
Fizz Rate [rating]	4	3	4	3	4	3	3	3	3
Sample weight [g]	2.00	1.99	1.99	2.02	2.03	1.99	2.01	2.02	2.01

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Analysis	48: 1017129	49: 1009891	50: 1027447	51: 1027455	52: 1018430	53: 1011111	54: 1019798	55: 1011804	56: 995902
HCl_add [mL]	40.00	20.00	110.00	20.00	95.00	20.00	30.00	30.00	90.40
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	13.63	10.80	45.18	15.85	23.56	8.31	13.08	13.24	28.12
Final pH [no unit]	1.64	1.40	1.54	1.26	1.84	1.84	1.55	1.54	1.62
NP [t CaCO3/1000 t]	65.9	23.1	163	10.3	176	29.4	42.1	41.5	155
AP [t CaCO3/1000 t]	29.1	5.94	1.25	3.44	1.25	9.69	4.06	1.25	1.25
Net NP [t CaCO3/1000 t]	36.8	17.2	162	6.86	175	19.7	38.0	40.2	154
NP/AP [ratio]	2.27	3.89	130	3.00	141	3.03	10.4	33.2	124
S [%]	1.14	0.241	0.031	0.115	< 0.005	0.413	0.152	0.022	0.020
Acid Leachable SO4-S [%]	0.21	0.05	<0.04	< 0.04	<0.04	0.10	< 0.04	<0.04	<0.04
Sulphide [%]	0.93	0.19	< 0.04	0.11	< 0.04	0.31	0.13	< 0.04	< 0.04
C [%]	0.777	0.271	2.05	0.120	2.20	0.352	0.479	0.494	1.74
CO3 (HCl) as %CO3 [%]	3.69	1.16	9.99	0.38	10.8	1.59	2.24	2.31	8.51

Analysis	57: 996071	58: 983936	59: 975618	60: 986301	61: 986527	62: 976319	63: 986619	64: 987176	65: 167317	66: 168506
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.45	9.40	9.51	9.51	9.59	9.69	9.16	9.30	9.55	9.14
Fizz Rate [rating]	3	3	3	3	4	3	4	4	3	3
Sample weight [g]	1.88	2.02	2.03	2.07	2.11	1.99	2.08	2.06	1.99	1.96
HCl_add [mL]	53.00	32.50	20.00	28.70	104.40	20.00	128.70	62.60	28.00	20.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	23.28	11.76	9.31	12.28	29.41	12.28	37.90	24.08	12.93	7.47
Final pH [no unit]	1.55	1.84	1.78	1.73	1.69	1.56	1.57	1.66	1.69	1.81
NP [t CaCO3/1000 t]	79.0	51.3	26.3	39.7	178	19.4	218	93.5	37.9	32.0
AP [t CaCO3/1000 t]	1.25	1.25	2.50	3.12	1.25	3.44	1.25	1.25	16.6	28.8
Net NP [t CaCO3/1000 t]	77.8	50.0	23.8	36.6	176	16.0	217	92.2	21.3	3.25
NP/AP [ratio]	63.2	41.0	10.5	12.7	142	5.64	175	74.8	2.29	1.11
S [%]	< 0.005	0.005	0.107	0.185	0.007	0.148	0.033	< 0.005	0.615	1.09
Acid Leachable SO4-S [%]	<0.04	<0.04	< 0.04	0.08	<0.04	< 0.04	<0.04	<0.04	0.08	0.17
Sulphide [%]	< 0.04	< 0.04	0.08	0.10	< 0.04	0.11	< 0.04	< 0.04	0.53	0.92
C [%]	0.899	0.576	0.301	0.471	2.11	0.213	2.40	1.14	0.464	0.380
CO3 (HCl) as %CO3 [%]	4.30	2.72	1.32	2.17	10.3	0.91	11.8	5.45	2.18	1.69

Analysis	67: 182574	68: 961457	69: 961744	70: 962052	71: 966413	72: 953697	73: 982894	74: 954236	75: 954535	76: 954874
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	8.92	9.42	9.33	9.43	9.32	9.67	9.12	9.32	9.73	8.81
Fizz Rate [rating]	4	3	3	3	3	3	3	3	3	3
Sample weight [g]	2.11	2.08	1.94	1.91	1.91	2.10	1.99	2.04	1.96	2.01

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Analysis	67: 182574	68: 961457	69: 961744	70: 962052	71: 966413	72: 953697	73: 982894	74: 954236	75: 954535	76: 954874
HCl_add [mL]	40.00	29.60	20.00	20.00	20.00	20.00	20.00	27.70	20.00	20.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	13.90	12.86	6.56	8.28	10.76	9.11	8.25	13.64	10.38	10.28
Final pH [no unit]	1.78	1.68	1.96	1.90	1.64	1.82	1.72	1.59	1.59	1.64
NP [t CaCO3/1000 t]	61.8	40.2	34.6	30.7	24.2	25.9	29.5	34.5	24.5	24.2
AP [t CaCO3/1000 t]	19.7	15.0	1.25	12.2	12.8	5.94	46.6	41.2	31.9	102
Net NP [t CaCO3/1000 t]	42.1	25.2	33.4	18.5	11.4	20.0	-17.06	-6.75	-7.38	-78.30
NP/AP [ratio]	3.14	2.68	27.7	2.52	1.89	4.36	0.63	0.84	0.77	0.24
S [%]	0.760	0.480	0.053	0.405	0.492	0.233	1.72	1.40	1.24	3.47
Acid Leachable SO4-S [%]	0.13	< 0.04	0.05	< 0.04	0.08	0.04	0.23	0.08	0.22	0.19
Sulphide [%]	0.63	0.48	< 0.04	0.39	0.41	0.19	1.49	1.32	1.02	3.28
C [%]	0.774	0.493	0.422	0.381	0.291	0.306	0.341	0.398	0.297	0.262
CO3 (HCl) as %CO3 [%]	3.67	2.27	1.84	1.72	1.28	1.36	1.52	1.82	1.31	1.17

Analysis	77: 955411	78: 993558	79: 993900	80: 977243	81: 977550	82: 987879	83: 959394	84: 988032	85: 977937	86: 978315
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.88	9.57	9.78	9.59	9.22	8.45	9.18	9.84	8.09	9.52
Fizz Rate [rating]	3	3	3	3	3	3	3	3	2	2
Sample weight [g]	1.97	1.99	2.12	2.04	2.00	2.00	1.95	2.00	1.89	1.93
HCl_add [mL]	20.00	20.00	20.00	20.00	20.00	92.60	20.00	20.00	20.00	30.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	6.13	9.22	9.42	12.35	6.39	31.06	12.08	11.01	13.81	13.04
Final pH [no unit]	1.84	1.66	1.71	1.57	1.92	1.77	1.45	1.52	1.34	1.66
NP [t CaCO3/1000 t]	35.2	27.1	25.0	18.7	34.0	154	20.3	22.5	16.4	43.9
AP [t CaCO3/1000 t]	27.2	27.2	11.6	15.0	29.4	106	19.7	14.1	275	11.2
Net NP [t CaCO3/1000 t]	8.01	-0.09	13.4	3.70	4.62	48.2	0.61	8.44	-258.29	32.6
NP/AP [ratio]	1.29	1.00	2.16	1.25	1.16	1.46	1.03	1.60	0.06	3.90
S [%]	0.976	0.985	0.421	0.614	1.19	3.47	0.714	0.499	9.00	0.430
Acid Leachable SO4-S [%]	0.11	0.12	0.05	0.13	0.25	0.09	0.08	0.05	0.21	0.07
Sulphide [%]	0.87	0.87	0.37	0.48	0.94	3.38	0.63	0.45	8.79	0.36
C [%]	0.423	0.322	0.317	0.235	0.408	2.10	0.226	0.266	0.100	0.538
CO3 (HCl) as %CO3 [%]	1.96	1.36	1.43	0.99	1.82	10.3	0.96	1.14	0.33	2.53

Analysis	87: 1023510	88: 1006148	89: 1006508	90: 1024643	91: 1006790	92: 954411	93: 1024043	94: 1024143	95: 1014178
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.40	9.56	9.70	9.69	9.43	9.35	9.66	9.65	9.43
Fizz Rate [rating]	3	3	2	3	4	2	3	3	3
Sample weight [g]	2.10	2.02	2.03	1.98	1.88	1.98	2.01	2.05	2.05

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Analysis	87: 1023510	88: 1006148	89: 1006508	90: 1024643	91: 1006790	92: 954411	93: 1024043	94: 1024143	95: 1014178
HCl_add [mL]	20.00	20.00	20.00	20.00	40.00	20.00	28.30	28.90	29.60
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	7.48	7.63	13.32	9.24	17.12	15.18	14.39	15.00	12.56
Final pH [no unit]	1.81	1.79	1.44	1.72	1.57	1.45	1.54	1.56	1.69
NP [t CaCO3/1000 t]	29.8	30.6	16.4	27.2	60.8	12.2	34.6	33.9	41.6
AP [t CaCO3/1000 t]	42.5	4.06	13.8	4.69	21.6	1.25	3.75	2.81	28.8
Net NP [t CaCO3/1000 t]	-12.70	26.5	2.65	22.5	39.2	11.0	30.8	31.1	12.8
NP/AP [ratio]	0.70	7.53	1.19	5.80	2.82	9.76	9.23	12.1	1.45
S [%]	1.57	0.158	0.486	0.192	0.742	0.017	0.182	0.145	1.14
Acid Leachable SO4-S [%]	0.21	< 0.04	0.05	0.04	0.05	< 0.04	0.06	0.06	0.22
Sulphide [%]	1.36	0.13	0.44	0.15	0.69	< 0.04	0.12	0.09	0.92
C [%]	0.362	0.374	0.194	0.334	0.741	0.144	0.414	0.402	0.490
CO3 (HCl) as %CO3 [%]	1.61	1.66	0.79	1.50	3.55	0.51	1.88	1.82	2.28

Analysis	96: 1014138	97: 1014189	98: 1007031	99: 1007347	100: 1016824	101: 1007426	102: 1015017	103: 1025702	104: 1026178
Sample Date & Time			N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]			9.42	9.51	9.27	9.18	9.35	9.58	8.82
Fizz Rate [rating]			3	3	3	3	3	3	3
Sample weight [g]			2.09	2.06	2.10	2.04	1.95	2.00	2.02
HCl_add [mL]			40.00	20.00	38.70	20.00	20.00	27.70	114.00
HCl [Normality]			0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]			0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]			18.37	9.23	15.60	7.91	6.71	12.35	23.81
Final pH [no unit]			1.58	1.82	1.56	1.96	1.96	1.70	1.90
NP [t CaCO3/1000 t]			51.7	26.1	55.0	29.6	34.1	38.4	223
AP [t CaCO3/1000 t]			3.44	6.56	30.3	35.3	15.6	2.19	4.06
Net NP [t CaCO3/1000 t]			48.3	19.5	24.7	-5.71	18.5	36.2	219
NP/AP [ratio]			15.0	3.98	1.81	0.84	2.18	17.6	54.9
S [%]			0.191	0.325	1.12	1.17	0.620	0.129	0.212
Acid Leachable SO4-S [%]			0.08	0.12	0.15	< 0.04	0.12	0.06	0.08
Sulphide [%]			0.11	0.21	0.97	1.13	0.50	0.07	0.13
C [%]			0.598	0.308	0.361	0.383	0.415	0.456	2.62
CO3 (HCl) as %CO3 [%]			2.80	1.40	1.64	1.74	1.87	2.11	13.0

Analysis	105: 1026138	106: 1026408	107: 1008488	108: 1008340	109: 1008876	110: 1009326	111: 1027298	112: 1027382	113: 1009713
Sample Date & Time	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.48	9.51	9.69		9.45	9.67	9.71	9.73	9.50
Fizz Rate [rating]	3	3	3		3	3	3	3	3
Sample weight [g]	1.98	1.99	2.00		1.98	2.01	2.01	2.02	1.99

OnLine LIMS

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Analysis	105: 1026138	106: 1026408	107: 1008488	108: 1008340	109: 1008876	110: 1009326	111: 1027298	112: 1027382	113: 1009713
HCl_add [mL]	20.00	25.00	20.00		30.00	35.00	20.00	20.00	30.00
HCl [Normality]	0.10	0.10	0.10		0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10		0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	6.84	10.12	6.70		14.82	15.13	8.88	8.61	14.43
Final pH [no unit]	1.77	1.48	1.82		1.39	1.45	1.52	1.52	1.43
NP [t CaCO3/1000 t]	33.2	37.4	33.3		38.3	49.4	27.7	28.2	39.1
AP [t CaCO3/1000 t]	9.06	16.9	30.0		5.94	1.25	5.00	5.94	9.06
Net NP [t CaCO3/1000 t]	24.1	20.5	3.30		32.4	48.2	22.7	22.3	30.0
NP/AP [ratio]	3.66	2.22	1.11		6.45	39.5	5.54	4.75	4.31
S [%]	0.391	0.632	1.06		0.249	0.070	0.248	0.259	0.307
Acid Leachable SO4-S [%]	0.10	0.09	0.10		0.06	< 0.04	0.09	0.07	< 0.04
Sulphide [%]	0.29	0.54	0.96		0.19	0.04	0.16	0.19	0.29
C [%]	0.400	0.444	0.396		0.442	0.579	0.329	0.336	0.437
CO3 (HCl) as %CO3 [%]	1.81	2.02	1.79		1.97	2.69	1.43	1.47	2.04

Analysis	114: 1043650	115: 1044017	116: 1044097	117: 996541	118: 989877	119: 973322	120: 956379	121: 956542	122: 984474	123: 957562
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.06	9.13	9.00	9.46	8.93	9.22	9.60	9.37	8.80	9.34
Fizz Rate [rating]	4	3	3	3	4	3	3	3	4	4
Sample weight [g]	1.98	1.99	1.98	2.00	1.98	1.98	2.02	2.02	2.00	2.00
HCl_add [mL]	60.00	20.00	30.00	30.00	65.00	20.00	30.00	30.00	120.00	60.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	22.66	9.67	13.16	14.39	23.46	9.08	14.34	15.40	36.37	27.37
Final pH [no unit]	1.53	1.53	1.42	1.39	1.53	1.46	1.48	1.43	1.69	1.44
NP [t CaCO3/1000 t]	94.3	26.0	42.5	39.0	105	27.6	38.8	36.1	209	81.6
AP [t CaCO3/1000 t]	13.1	47.8	25.3	44.4	55.3	30.0	16.6	50.9	6.25	5.31
Net NP [t CaCO3/1000 t]	81.2	-21.81	17.2	-5.38	49.6	-2.40	22.2	-14.84	203	76.3
NP/AP [ratio]	7.18	0.54	1.68	0.88	1.90	0.92	2.34	0.71	33.5	15.4
S [%]	0.507	1.80	0.837	1.68	1.85	1.12	0.539	1.67	0.220	0.209
Acid Leachable SO4-S [%]	0.09	0.27	< 0.04	0.26	0.08	0.16	< 0.04	0.04	< 0.04	< 0.04
Sulphide [%]	0.42	1.53	0.81	1.42	1.77	0.96	0.53	1.63	0.20	0.17
C [%]	1.10	0.282	0.487	0.504	1.26	0.325	0.453	0.429	2.47	0.912
CO3 (HCl) as %CO3 [%]	5.35	1.27	2.31	2.33	6.13	1.44	2.06	1.92	12.2	4.39

Analysis	124: 957928	125: 958200	126: 986925	127: 182172	128: 991156	129: 1009992	130: 1010237	131: 989779	132: 955824	133: 955884
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.52	9.17	9.13	9.73	9.68	9.26	9.31	9.68	9.62	9.57
Fizz Rate [rating]	3	4	3	3	3	4	3	3	3	3
Sample weight [g]	2.00	2.01	2.01	1.98	1.99	2.00	1.99	1.98	2.02	1.99

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Analysis	124: 957928	125: 958200	126: 986925	127: 182172	128: 991156	129: 1009992	130: 1010237	131: 989779	132: 955824	133: 955884
HCl_add [mL]	20.00	60.00	30.00	30.00	30.00	40.00	20.00	35.00	30.00	35.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	9.25	25.63	14.00	14.72	15.40	18.28	11.34	16.86	14.59	16.49
Final pH [no unit]	1.55	1.54	1.45	1.42	1.36	1.40	1.37	1.40	1.41	1.42
NP [t CaCO3/1000 t]	26.9	85.5	39.8	38.6	36.7	54.3	21.8	45.8	38.1	46.5
AP [t CaCO3/1000 t]	42.8	1.88	43.4	1.25	28.1	20.6	23.1	7.50	2.19	12.5
Net NP [t CaCO3/1000 t]	-15.91	83.6	-3.64	37.4	8.58	33.7	-1.32	38.3	35.9	34.0
NP/AP [ratio]	0.63	45.6	0.92	30.9	1.30	2.63	0.94	6.11	17.4	3.72
S [%]	1.52	0.074	1.46	< 0.005	0.955	0.692	0.729	0.334	0.096	0.491
Acid Leachable SO4-S [%]	0.15	< 0.04	0.07	< 0.04	0.06	< 0.04	< 0.04	0.09	< 0.04	0.09
Sulphide [%]	1.37	0.06	1.39	< 0.04	0.90	0.66	0.74	0.24	0.07	0.40
C [%]	0.319	1.00	0.472	0.468	0.416	0.631	0.322	0.548	0.460	0.551
CO3 (HCl) as %CO3 [%]	1.38	4.83	2.17	2.17	1.88	3.00	1.48	2.59	2.11	2.49

Analysis	134: 1006198	135: 1010388	136: 1010413	137: 1010700	138: 1006857	139: 1010941	140: 1018771	141: 1011231	142: 1019658
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.61	9.25	9.76	9.34	9.59	8.77	9.66	9.36	9.57
Fizz Rate [rating]	3	4	3	3	4	3	3	3	3
Sample weight [g]	1.99	1.98	1.99	1.99	2.03	1.99	2.04	1.99	2.04
HCl_add [mL]	30.00	40.00	20.00	20.00	40.00	25.00	20.00	30.00	30.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	14.88	18.47	8.52	7.30	20.06	10.80	8.63	12.01	15.26
Final pH [no unit]	1.38	1.40	1.54	1.78	1.41	1.51	1.62	1.50	1.44
NP [t CaCO3/1000 t]	38.0	54.4	28.8	31.9	49.1	35.7	27.9	45.2	36.1
AP [t CaCO3/1000 t]	9.38	35.3	5.94	15.0	5.94	29.7	2.50	29.7	15.6
Net NP [t CaCO3/1000 t]	28.6	19.1	22.9	16.9	43.2	6.01	25.4	15.5	20.5
NP/AP [ratio]	4.05	1.54	4.85	2.13	8.27	1.20	11.2	1.52	2.31
S [%]	0.339	1.15	0.241	0.532	0.272	0.971	0.116	1.00	0.521
Acid Leachable SO4-S [%]	< 0.04	< 0.04	0.05	0.05	0.08	< 0.04	< 0.04	0.06	< 0.04
Sulphide [%]	0.30	1.13	0.19	0.48	0.19	0.95	0.08	0.95	0.50
C [%]	0.455	0.625	0.341	0.377	0.598	0.425	0.332	0.551	0.435
CO3 (HCl) as %CO3 [%]	2.05	2.95	1.54	1.70	2.79	1.98	1.49	2.53	1.96

Analysis	143: 1019827	144: 1011905	145: 1020450	146: 1021458	147: 1022334	148: 1022283	149: 1030811	150: 1042567	151: 1048365
Sample Date & Time	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A
Paste pH [no unit]	9.09	9.34	9.09	9.08	9.35		8.33	9.57	9.48
Fizz Rate [rating]	3	4	3	3	3		4	3	3
Sample weight [g]	1.99	2.00	1.98	2.00	1.99		2.04	1.99	2.03

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LR Report : **CA19146-AUG22**

Analysis	143: 1019827	144: 1011905	145: 1020450	146: 1021458	147: 1022334	148: 1022283	149: 1030811	150: 1042567	151: 1048365
HCl_add [mL]	30.00	40.00	20.00	35.00	20.00		40.00	20.00	20.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10		0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10		0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	13.36	14.98	14.70	15.53	6.64		11.41	7.73	9.89
Final pH [no unit]	1.52	1.50	1.15	1.45	1.84		1.65	1.47	1.40
NP [t CaCO3/1000 t]	41.8	62.5	13.4	48.7	33.6		70.1	30.8	24.9
AP [t CaCO3/1000 t]	17.2	40.6	103	31.2	32.2		301	26.2	3.75
Net NP [t CaCO3/1000 t]	24.6	21.9	-90.04	17.4	1.41		-230.84	4.55	21.2
NP/AP [ratio]	2.43	1.54	0.13	1.56	1.04		0.23	1.17	6.64
S [%]	0.728	1.33	3.27	1.16	1.13		11.2	0.851	0.182
Acid Leachable SO4-S [%]	0.18	< 0.04	< 0.04	0.16	0.10		1.52	< 0.04	0.06
Sulphide [%]	0.55	1.30	3.31	1.00	1.03		9.63	0.84	0.12
C [%]	0.465	0.736	0.153	0.559	0.404		0.865	0.372	0.305
CO3 (HCl) as %CO3 [%]	2.14	3.52	0.62	2.64	1.83		4.13	1.67	1.35

Analysis	152: 996297	153: 956228	154: 956284	155: 957775	156: 986388
Sample Date & Time	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.61	9.87	9.43	9.16	9.43
Fizz Rate [rating]	3	2	3	4	3
Sample weight [g]	2.04	2.02	2.01	1.99	1.99
HCl_add [mL]	35.00	20.00	30.00	60.00	20.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	16.12	15.81	11.78	25.98	8.12
Final pH [no unit]	1.42	1.11	1.46	1.43	1.71
NP [t CaCO3/1000 t]	46.3	10.4	45.3	85.5	29.8
AP [t CaCO3/1000 t]	3.12	3.75	31.2	50.9	11.6
Net NP [t CaCO3/1000 t]	43.2	6.65	14.0	34.6	18.2
NP/AP [ratio]	14.8	2.77	1.45	1.68	2.58
S [%]	0.215	0.182	1.04	1.94	0.515
Acid Leachable SO4-S [%]	0.12	0.06	< 0.04	0.31	0.14
Sulphide [%]	0.10	0.12	1.00	1.63	0.37
C [%]	0.570	0.133	0.546	0.999	0.357
CO3 (HCl) as %CO3 [%]	2.68	0.51	2.57	4.82	1.58

*NP (Neutralization Potential)

$$= \frac{50 \times (N \text{ of HCL} \times \text{Total HCL added} - N \text{ NaOH} \times \text{NaOH added})}{\text{Weight of Sample}}$$

*AP (Acid Potential) = % Sulphide Sulphur x 31.25
*Net NP (Net Neutralization Potential) = NP-AP
NP/AP Ratio = NP/AP
*Results expressed as tonnes CaCO3 equivalent/1000 tonnes of material
Samples with a % Sulphide value of <0.04 will be calculated using a 0.04 value.

OnLine LIMS

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LR Report : **CA19146-AUG22**

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29-December-2022

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A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 07 December 2022
LR Report: **CA19064-DEC22**
Reference: Berry Composites - Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR	6: B SED	7: B MD	8: B QTP	9: B LGO	10: B HGO
Mercury [ug/g]	19-Dec-22	23:49	20-Dec-22	15:33	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Silver [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	0.97	0.93	4.6	1.1	2.7	1.1
Aluminum [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	7400	10000	26000	6100	6600	6900
Barium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	22	83	18	9.8	15	10
Beryllium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	0.14	0.31	0.32	0.12	0.10	0.09
Bismuth [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	0.20	0.10	< 0.09	0.16	0.65	1.2
Calcium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	8600	19000	24000	7500	15000	12000
Cadmium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	0.19	0.10	0.11	0.075	0.040	0.030
Cobalt [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	3.5	8.2	22	4.2	21	4.8
Chromium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	3.5	13	58	6.2	4.7	7.1
Copper [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	18	42	38	26	26	26
Iron [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	17000	21000	48000	15000	31000	25000
Potassium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	490	740	350	280	590	320
Lithium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	2.7	5.6	8.0	2.6	2.2	2.5
Magnesium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	2200	7200	17000	2100	2600	2800
Manganese [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	380	810	900	370	560	410
Molybdenum [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	1.8	1.9	1.3	1.6	3.8	5.7
Nickel [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	1.3	13	20	2.2	2.6	2.8
Lead [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	1.3	1.8	5.0	0.85	5.8	1.7
Antimony [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	< 6	< 6	< 6	< 6	< 6	< 6
Selenium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Tin [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	< 2	< 2	< 2	< 2	< 2	< 2
Strontium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	8.3	36	42	10	14	12
Titanium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:33	28	33	250	27	29	48
Thallium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:34	< 0.02	< 0.02	< 0.02	< 0.02	0.04	< 0.02
Uranium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:34	0.14	0.62	0.16	0.11	0.10	0.10
Vanadium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:34	7.1	26	100	8.4	7.7	9.6
Yttrium [µg/g]	19-Dec-22	23:49	20-Dec-22	15:34	6.4	8.0	12	5.5	6.5	6.1
Zinc [µg/g]	19-Dec-22	23:49	20-Dec-22	15:34	26	39	75	24	25	26

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LR Report : **CA19064-DEC22**

Method Descriptions

Parameter	SGS Method Code	Reference Method Code
Mercury by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004	EPA 7471A/EPA 245
Metals in Soil - Aqua-regia/ICP-MS	ME-CA-[ENV]SPE-LAK-AN-005	EPA 3050/EPA 200.8

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Quality Control Report

Inorganic Analysis													
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material		
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Mercury by CVAAS - QCBatchID: EMS0144-DEC22													
Mercury	0.05	ug/g	<0.05			ND	20	96	80	120	118	70	130
Metals in Soil - Aqua-regia/ICP-MS - QCBatchID: EMS0144-DEC22													
Aluminum	3	µg/g	<3			1	20	92	70	130	NV	70	130
Antimony	6	µg/g	<0.8			ND	20	91	70	130	NV	70	130
Arsenic	0.5	µg/g	<0.5			4	20	92	70	130	83	70	130
Barium	0.01	µg/g	<0.01			2	20	100	70	130	93	70	130
Beryllium	0.02	µg/g	<0.02			7	20	94	70	130	NV	70	130
Bismuth	0.09	µg/g	<0.09			2	20	95	70	130	NV	70	130
Cadmium	0.02	µg/g	<0.02			8	20	101	70	130	NV	70	130
Calcium	3	µg/g	17.4			1	20	95	70	130	NV	70	130
Chromium	0.5	µg/g	<0.5			8	20	91	70	130	76	70	130
Cobalt	0.01	µg/g	<0.01			1	20	93	70	130	87	70	130
Copper	0.1	µg/g	<0.1			1	20	94	70	130	85	70	130
Iron	3	µg/g	23.1			3	20	97	70	130	78	70	130
Lead	0.05	µg/g	<0.05			7	20	90	70	130	101	70	130
Lithium	2	µg/g	<2			4	20	94	70	130	NV	70	130
Magnesium	3	µg/g	3.2			1	20	93	70	130	NV	70	130
Manganese	0.1	µg/g	<0.1			1	20	95	70	130	95	70	130
Molybdenum	0.1	µg/g	<0.1			15	20	102	70	130	NV	70	130
Nickel	0.1	µg/g	<0.1			2	20	94	70	130	85	70	130
Potassium	3	µg/g	<3			3	20	92	70	130	NV	70	130
Selenium	0.7	µg/g	<0.7			ND	20	96	70	130	NV	70	130
Silver	1	µg/g	<0.01			ND	20	91	70	130	129	70	130
Strontium	0.02	µg/g	<0.02			1	20	90	70	130	NV	70	130
Thallium	0.02	µg/g	<0.02			ND	20	NV	70	130	NV	70	130
Tin	2	µg/g	<2			ND	20	92	70	130	NV	70	130
Titanium	0.1	µg/g	<0.1			18	20	94	70	130	NV	70	130
Uranium	0.002	µg/g	<0.002			0	20	92	70	130	NV	70	130
Vanadium	1	µg/g	<1			1	20	93	70	130	89	70	130
Yttrium	0.004	µg/g	<0.004			2	20	93	70	130	NV	70	130
Zinc	0.7	µg/g	<0.7			1	20	91	70	130	81	70	130

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29-December-2022

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Date Rec. : 07 December 2022
LR Report: **CA19066-DEC22**
Reference: Berry Composites - Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR	6: B SED	7: B MD	8: B QTP	9: B LGO	10: B HGO
SiO2 [%]	14-Dec-22	10:47	19-Dec-22	08:30	72.5	63.5	54.4	75.5	72.2	73.9
Al2O3 [%]	14-Dec-22	10:47	19-Dec-22	08:30	11.6	12.5	11.8	10.7	11.2	11.2
Fe2O3 [%]	14-Dec-22	10:47	19-Dec-22	08:30	4.24	5.36	10.3	3.52	4.69	4.18
MgO [%]	14-Dec-22	10:47	19-Dec-22	08:30	0.71	2.34	4.44	0.69	0.67	0.59
CaO [%]	14-Dec-22	10:47	19-Dec-22	08:30	2.64	4.98	6.63	1.84	2.64	2.19
Na2O [%]	14-Dec-22	10:47	19-Dec-22	08:30	3.92	1.64	2.19	3.88	3.63	4.42
K2O [%]	14-Dec-22	10:47	19-Dec-22	08:30	0.63	1.38	0.31	0.49	0.75	0.40
TiO2 [%]	14-Dec-22	10:47	19-Dec-22	08:30	0.27	0.42	1.18	0.28	0.30	0.28
P2O5 [%]	14-Dec-22	10:47	19-Dec-22	08:30	0.05	0.12	0.14	0.05	0.05	0.05
MnO [%]	14-Dec-22	10:47	19-Dec-22	08:30	0.07	0.15	0.17	0.06	0.09	0.06
Cr2O3 [%]	14-Dec-22	10:47	19-Dec-22	08:30	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
V2O5 [%]	14-Dec-22	10:47	19-Dec-22	08:30	< 0.01	< 0.01	0.04	< 0.01	0.01	< 0.01
LOI [%]	14-Dec-22	10:47	19-Dec-22	08:30	3.04	6.66	8.05	2.62	3.41	2.46
Sum [%]	14-Dec-22	10:47	19-Dec-22	08:30	99.6	99.0	99.8	99.6	99.6	99.7

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29-December-2022

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Date Rec. : 08 December 2022
LR Report: **CA19106-DEC22**
Reference: Berry Composites- Set 3- As Rec'd

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B-QPOR_FB	6: B-CG_FB	7: M-MD_FB	8: B-QTP_FB	9: B-LGO_FB
SiO2 [%]	20-Dec-22	17:51	28-Dec-22	09:39	72.0	62.8	55.2	72.3	72.4
Al2O3 [%]	20-Dec-22	17:51	28-Dec-22	09:39	12.2	13.4	13.0	11.9	12.2
Fe2O3 [%]	20-Dec-22	17:51	28-Dec-22	09:39	4.14	5.47	8.68	3.98	3.80
MgO [%]	20-Dec-22	17:51	28-Dec-22	09:39	1.01	2.24	3.30	0.78	0.71
CaO [%]	20-Dec-22	17:51	28-Dec-22	09:39	2.76	5.16	6.60	2.71	2.34
Na2O [%]	20-Dec-22	17:51	28-Dec-22	09:39	3.64	2.01	3.39	3.88	3.76
K2O [%]	20-Dec-22	17:51	28-Dec-22	09:39	0.69	1.40	0.58	0.71	0.88
TiO2 [%]	20-Dec-22	17:51	28-Dec-22	09:39	0.36	0.52	1.11	0.34	0.31
P2O5 [%]	20-Dec-22	17:51	28-Dec-22	09:39	0.06	0.13	0.15	0.07	0.06
MnO [%]	20-Dec-22	17:51	28-Dec-22	09:39	0.07	0.14	0.17	0.08	0.07
Cr2O3 [%]	20-Dec-22	17:51	28-Dec-22	09:39	0.02	0.02	0.01	0.02	0.02
V2O5 [%]	20-Dec-22	17:51	28-Dec-22	09:39	< 0.01	0.02	0.03	< 0.01	< 0.01
LOI [%]	20-Dec-22	17:51	28-Dec-22	09:39	3.22	6.57	7.22	2.82	2.71
Sum [%]	20-Dec-22	17:51	28-Dec-22	09:39	100.2	100.0	99.3	99.6	99.3

Analysis	10: B-HGO_FB	11: B-QPOR_FB DUP	12: B-CG_FB DUP	13: M-MD_FB DUP	14: B-QTP_FB DUP	15: B-LGO_FB DUP	16: B-HGO_FB DUP
SiO2 [%]	71.7	71.6	62.7	55.0	72.0	72.5	71.9
Al2O3 [%]	11.6	12.1	13.4	13.0	11.8	12.2	11.6
Fe2O3 [%]	4.14	4.13	5.46	8.59	3.95	3.82	4.16
MgO [%]	0.83	1.02	2.22	3.32	0.79	0.71	0.84
CaO [%]	2.49	2.73	5.15	6.60	2.70	2.31	2.50
Na2O [%]	4.02	3.60	2.02	3.40	3.90	3.74	4.01
K2O [%]	0.63	0.69	1.39	0.58	0.72	0.90	0.63
TiO2 [%]	0.35	0.36	0.51	1.12	0.33	0.30	0.36
P2O5 [%]	0.06	0.07	0.12	0.15	0.06	0.05	0.06
MnO [%]	0.07	0.06	0.15	0.17	0.08	0.07	0.07
Cr2O3 [%]	0.03	0.02	0.01	0.01	0.02	0.02	0.02
V2O5 [%]	< 0.01	< 0.01	0.01	0.04	< 0.01	< 0.01	< 0.01
LOI [%]	3.05	3.19	6.67	7.46	2.78	2.65	2.81
Sum [%]	99.0	99.5	99.8	99.4	99.1	99.3	98.9

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LR Report : **CA19106-DEC22**

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29-December-2022

Marathon Gold Corp
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Date Rec. : 01 December 2022
LR Report: **CA19002-DEC22**
Reference: Berry Composites - Set 1- As Rec'd

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG	6: B SED-High SFE	7: B QTP-PAG	8: B LGO-PAG	9: B HGO-PAG-Zn	10: B OB-ML	11: B QPOR-PAG-DUP	12: B SED-High SFE- DUP
Paste pH [no unit]	14-Dec-22	16:00	16-Dec-22	15:42	9.20	9.07	9.24	8.39	9.29	7.46	9.16	9.08
Fizz Rate [rating]	14-Dec-22	16:00	16-Dec-22	15:42	2	2	2	2	2	2	2	2
Sample weight [g]	14-Dec-22	16:00	16-Dec-22	15:42	2.07	2.11	2.03	1.92	2.01	2.06	1.99	1.95
HCl Added [mL]	15-Dec-22	14:00	16-Dec-22	15:42	20.00	27.80	20.00	20.00	20.00	20.00	20.00	26.10
HCl [Normality]	14-Dec-22	16:00	16-Dec-22	15:42	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	14-Dec-22	16:00	16-Dec-22	15:42	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NaOH to pH=8.3 [mL]	16-Dec-22	14:41	16-Dec-22	15:42	13.66	12.71	9.57	8.22	12.13	15.92	13.91	11.88
Final pH [no unit]	15-Dec-22	16:01	16-Dec-22	15:42	1.32	1.62	1.56	1.77	1.40	1.44	1.26	1.60
NP [t CaCO3/1000 t]	16-Dec-22	14:41	16-Dec-22	15:42	15.3	35.8	25.7	30.7	19.6	9.9	15.3	36.5
AP [t CaCO3/1000 t]	16-Dec-22	15:42	16-Dec-22	15:43	29.1	3.12	40.6	160	23.1	1.25	30.9	3.75
Net NP [t CaCO3/1000 t]	16-Dec-22	15:42	16-Dec-22	15:43	-13.76	32.7	-14.92	-128.99	-3.52	8.65	-15.64	32.8
NP/AP [ratio]	16-Dec-22	15:42	16-Dec-22	15:43	0.53	11.5	0.63	0.19	0.85	7.92	0.49	9.73
Sulphur (total) [%]	08-Dec-22	18:00	14-Dec-22	15:06	1.05	0.154	1.32	5.35	0.811	0.091	1.076	0.153
Acid Leachable SO4-S [%]	14-Dec-22	15:03	14-Dec-22	15:06	0.12	0.05	< 0.04	0.24	0.07	0.08	0.09	< 0.04
Sulphide [%]	14-Dec-22	09:55	14-Dec-22	15:06	0.93	0.10	1.30	5.11	0.74	< 0.04	0.99	0.12
Carbon (total) [%]	08-Dec-22	18:00	13-Dec-22	11:45	0.193	0.390	0.302	0.377	0.231	0.308	0.194	0.395
Carbonate (HCl) [%]	13-Dec-22	10:28	13-Dec-22	11:45	0.85	1.87	1.41	1.79	1.05	0.68	0.85	1.90

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Analysis	13: B QTP-PAG-DUP	14: B LGO-PAG-DUP	15: B HGO-PAG-Zn-DUP	16: B OB-ML- DUP
Paste pH [no unit]	9.25	8.33	9.17	7.37
Fizz Rate [rating]	3	3	2	3
Sample weight [g]	2.06	2.00	2.04	1.94
HCl Added [mL]	20.00	20.00	20.00	20.00
HCl [Normality]	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10
NaOH to pH=8.3 [mL]	9.25	7.84	12.22	16.18
Final pH [no unit]	1.58	1.85	1.40	1.33
NP [t CaCO3/1000 t]	26.1	30.4	19.1	9.9
AP [t CaCO3/1000 t]	39.4	163	23.8	1.25
Net NP [t CaCO3/1000 t]	-13.28	-132.72	-4.65	8.65
NP/AP [ratio]	0.66	0.19	0.80	7.92
Sulphur (total) [%]	1.38	5.40	0.825	0.091
Acid Leachable SO4-S [%]	0.12	0.18	0.06	0.05
Sulphide [%]	1.26	5.22	0.76	0.04
Carbon (total) [%]	0.310	0.378	0.231	0.299
Carbonate (HCl) [%]	1.41	1.81	1.08	0.64

*NP (Neutralization Potential)

$$= \frac{50 \times (N \text{ of HCL} \times \text{Total HCL added} - N \text{ NaOH} \times \text{NaOH added})}{\text{Weight of Sample}}$$

*AP (Acid Potential) = % Sulphide Sulphur x 31.25
*Net NP (Net Neutralization Potential) = NP-AP
NP/AP Ratio = NP/AP
*Results expressed as tonnes CaCO3 equivalent/1000 tonnes of material
Samples with a % Sulphide value of <0.04 will be calculated using a 0.04 value.

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Method Descriptions

Parameter	SGS Method Code	Reference Method Code
Acid Potential	ME-CA-[ENV]ARD-LAK-AN-001/003	MEND PROJECT 1.16.1B
Carbon/Sulphur	ME-CA-[ENV]ARD-LAK-AN-019	ASTM E1915-07A
Carbon/Sulphur	ME-CA-[ENV]ARD-LAK-AN-020	ASTM E1915-07A
Neutralization Potential	ME-CA-[ENV]ARD-LAK-AN-001/003	MEND PROJECT 1.16.1B
Paste pH	ME-CA-[ENV]ARD-LAK-AN-005	ARD Predicition Manual, 2009

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Quality Control Report

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Carbon/Sulphur - QCBatchID: ECS0029-DEC22														
Sulphide	0.04	%	< 0.04			5	20	97	80	120				
Carbon/Sulphur - QCBatchID: ECS0031-DEC22														
Carbon (total)	0.005	%	<0.005			1	20				96	70	130	
Sulphur (total)	0.005	%	<0.005			3	20				104	70	130	
Carbon/Sulphur - QCBatchID: ECS0043-DEC22														
Carbonate (HCl)	0.04	%	<0.04			1	20	98	80	120				

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29-December-2022

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Date Rec. : 01 December 2022
LR Report: **CA19003-DEC22**
Reference: Berry Composites- Set 1- As Rec'd

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG	6: B SED-High SFE	7: B QTP-PAG	8: B LGO-PAG	9: B HGO-PAG-Zn	10: B OB-ML	11: B QPOR-PAG-DUP	12: B SED-High SFE- DUP
Mercury [ug/g]	09-Dec-22	16:29	12-Dec-22	15:05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Silver [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	1.4	2.4	2.7	6.2	1.5	22	1.5	2.5
Aluminum [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	6300	16000	5200	6400	6900	16000	6400	16000
Barium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	18	39	17	22	11	64	20	41
Beryllium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	0.11	0.28	0.08	0.09	0.07	0.29	0.11	0.28
Bismuth [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	0.29	< 0.09	0.37	1.1	6.3	0.17	0.31	< 0.09
Calcium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	6300	14000	10000	12000	7400	5400	6400	15000
Cadmium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	0.03	0.04	0.03	< 0.02	0.04	0.16	0.03	0.04
Cobalt [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	4.1	10	18	28	6.8	16	4.1	10
Chromium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	95	69	130	90	150	73	95	71
Copper [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	15	25	13	92	13	45	16	25
Iron [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	24000	31000	25000	64000	24000	39000	24000	32000
Potassium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	560	990	550	650	470	1600	580	1000
Lithium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	2	9	2	2	< 2	15	2	9
Magnesium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	2300	12000	2200	2500	2700	11000	2300	12000
Manganese [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	320	730	300	320	290	600	330	740
Molybdenum [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	1.2	1.3	4.4	1.6	2.5	1.3	1.2	1.1
Nickel [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	5.7	21	6.3	5.0	6.5	29	6.0	21
Lead [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	0.80	2.8	0.76	1.3	5.5	8.2	0.84	3.0

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Trace Metals - Aqua Regia Digest, ICP-MS

LR Report : **CA19003-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG	6: B SED-High SFE	7: B QTP-PAG	8: B LGO-PAG	9: B HGO-PAG-Zn	10: B OB-ML	11: B QPOR-PAG-DUP	12: B SED-High SFE- DUP
Antimony [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Selenium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	< 0.7	< 0.7	0.8	1.1	< 0.7	< 0.7	< 0.7	< 0.7
Tin [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Strontium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	7.3	23	11	12	8.5	17	7.6	22
Titanium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	49	87	50	29	82	1500	100	95
Thallium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.09	< 0.02	< 0.02
Uranium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	0.13	0.58	0.10	0.12	0.090	1.6	0.14	0.59
Vanadium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	3	26	5	8	7	63	3	27
Yttrium [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	5.5	9.6	5.0	6.4	4.3	9.3	5.5	9.3
Zinc [µg/g]	09-Dec-22	16:29	12-Dec-22	15:05	17	50	13	17	18	62	17	51

Analysis	13: B QTP-PAG-DUP	14: B LGO-PAG-DUP	15: B HGO-PAG-Zn-DUP	16: B OB-ML- DUP
Mercury [ug/g]	< 0.05	< 0.05	< 0.05	< 0.05
Silver [µg/g]	< 1	< 1	< 1	< 1
Arsenic [µg/g]	2.7	6.2	1.4	21
Aluminum [µg/g]	5200	6600	7200	17000
Barium [µg/g]	17	22	12	62
Beryllium [µg/g]	0.08	0.09	0.07	0.29
Bismuth [µg/g]	0.33	1.1	6.5	0.17
Calcium [µg/g]	9900	13000	7500	5600
Cadmium [µg/g]	0.03	< 0.02	0.03	0.19
Cobalt [µg/g]	18	30	6.9	16
Chromium [µg/g]	130	91	150	74
Copper [µg/g]	13	93	13	46
Iron [µg/g]	25000	66000	24000	40000
Potassium [µg/g]	560	680	490	1700
Lithium [µg/g]	< 2	2	< 2	14
Magnesium [µg/g]	2200	2500	2700	11000
Manganese [µg/g]	300	330	290	610
Molybdenum [µg/g]	4.3	1.2	2.6	1.3
Nickel [µg/g]	6.4	5.1	6.4	29
Lead [µg/g]	0.73	1.4	5.5	7.9
Antimony [µg/g]	< 6	< 6	< 6	< 6

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Analysis	13: B QTP-PAG-DUP	14: B LGO-PAG-DUP	15: B HGO-PAG-Zn-DUP	16: B OB-ML- DUP
Selenium [µg/g]	0.7	1.1	< 0.7	< 0.7
Tin [µg/g]	< 2	< 2	< 2	< 2
Strontium [µg/g]	11	12	8.5	17
Titanium [µg/g]	41	30	82	1500
Thallium [µg/g]	< 0.02	< 0.02	< 0.02	0.10
Uranium [µg/g]	0.099	0.10	0.10	1.5
Vanadium [µg/g]	5	8	7	65
Yttrium [µg/g]	5.0	6.1	4.2	9.5
Zinc [µg/g]	13	17	19	63

Method Descriptions

Parameter	SGS Method Code	Reference Method Code
Mercury by CVAAS	ME-CA-[ENV]SPE-LAK-AN-004	EPA 7471A/EPA 245
Metals in Soil - Aqua-regia/ICP-MS	ME-CA-[ENV]SPE-LAK-AN-005	EPA 3050/EPA 200.8

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Quality Control Report

Inorganic Analysis													
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material		
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Mercury by CVAAS - QCBatchID: EMS0062-DEC22													
Mercury	0.05	ug/g	<0.05			ND	20	109	80	120	112	70	130
Metals in Soil - Aqua-regia/ICP-MS - QCBatchID: EMS0062-DEC22													
Aluminum	3	µg/g	<3			0	20	106	70	130	NV	70	130
Antimony	6	µg/g	<0.8			ND	20	95	70	130	NV	70	130
Arsenic	0.5	µg/g	<0.5			1	20	93	70	130	109	70	130
Barium	0.01	µg/g	<0.01			5	20	94	70	130	109	70	130
Beryllium	0.02	µg/g	<0.02			7	20	90	70	130	NV	70	130
Bismuth	0.09	µg/g	<0.09			3	20	96	70	130	NV	70	130
Cadmium	0.02	µg/g	<0.02			ND	20	97	70	130	NV	70	130
Calcium	3	µg/g	<3			0	20	101	70	130	NV	70	130
Chromium	0.5	µg/g	<0.5			1	20	98	70	130	82	70	130
Cobalt	0.01	µg/g	<0.01			4	20	98	70	130	96	70	130
Copper	0.1	µg/g	<0.1			1	20	99	70	130	92	70	130
Iron	3	µg/g	100.5			1	20	107	70	130	111	70	130
Lead	0.05	µg/g	<0.05			9	20	92	70	130	118	70	130
Lithium	2	µg/g	<2			1	20	90	70	130	NV	70	130
Magnesium	3	µg/g	<3			1	20	105	70	130	NV	70	130
Manganese	0.1	µg/g	<0.1			0	20	102	70	130	112	70	130
Molybdenum	0.1	µg/g	<0.1			6	20	94	70	130	NV	70	130
Nickel	0.1	µg/g	<0.1			1	20	101	70	130	96	70	130
Potassium	3	µg/g	<3			1	20	103	70	130	NV	70	130
Selenium	0.7	µg/g	<0.7			ND	20	98	70	130	NV	70	130
Silver	1	µg/g	<0.01			3	20	101	70	130	128	70	130
Strontium	0.02	µg/g	<0.02			1	20	93	70	130	NV	70	130
Thallium	0.02	µg/g	<0.02			ND	20	NV	70	130	NV	70	130
Tin	2	µg/g	<2			ND	20	97	70	130	NV	70	130
Titanium	0.1	µg/g	<0.1			7	20	97	70	130	NV	70	130
Uranium	0.002	µg/g	<0.002			1	20	91	70	130	NV	70	130
Vanadium	1	µg/g	<1			2	20	97	70	130	100	70	130
Yttrium	0.004	µg/g	<0.004			1	20	94	70	130	NV	70	130
Zinc	0.7	µg/g	<0.7			2	20	97	70	130	87	70	130

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29-December-2022

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Date Rec. : 01 December 2022
LR Report: **CA19005-DEC22**
Reference: Berry Composites- Set 1- As Rec'd

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CERTIFICATE OF ANALYSIS

Final Report

Sample ID	SiO2 %	Al2O3 %	Fe2O3 %	MgO %	CaO %	Na2O %	K2O %	TiO2 %	P2O5 %	MnO %	Cr2O3 %	V2O5 %	LOI %	Sum %
1: Analysis Start Date	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22	08-Dec-22
2: Analysis Start Time	11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54	11:54
3: Analysis Completed Date	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22	14-Dec-22
4: Analysis Completed Time	08:49	08:49	08:49	08:49	08:49	08:49	08:49	08:49	08:49	08:49	08:49	08:49	08:49	08:49
5: B QPOR-PAG	74.9	12.0	3.49	0.46	1.18	4.41	0.63	0.30	0.05	0.04	0.03	< 0.01	2.02	99.6
6: B SED-High SFE	67.6	13.4	5.53	2.36	2.33	1.71	1.46	0.59	0.13	0.10	0.01	0.01	4.03	99.4
7: B QTP-PAG	73.2	11.3	4.26	0.73	2.13	3.88	0.61	0.32	0.06	0.05	0.04	< 0.01	2.88	99.5
8: B LGO-PAG	71.0	9.31	8.47	0.53	1.92	2.09	0.80	0.24	0.05	0.04	0.04	< 0.01	4.77	99.3
9: B HGO-PAG-Zn	82.0	7.58	3.19	0.45	1.18	2.61	0.41	0.21	0.03	0.03	0.05	< 0.01	2.13	99.9
10: B OB-ML	65.8	13.7	6.89	2.41	2.40	3.19	1.41	1.13	0.17	0.14	0.02	0.03	2.99	100.3
11: B QPOR-PAG- DUP	75.3	12.0	3.50	0.46	1.18	4.46	0.63	0.30	0.05	0.04	0.03	< 0.01	2.15	100.1
12: B SED-High SFE- DUP	68.2	13.6	5.53	2.39	2.35	1.71	1.45	0.59	0.14	0.11	0.02	0.01	4.06	100.2
13: B QTP-PAG- DUP	73.0	11.3	4.26	0.73	2.11	3.92	0.61	0.32	0.06	0.05	0.03	< 0.01	3.06	99.5
14: B LGO-PAG- DUP	70.6	9.26	8.43	0.53	1.92	2.08	0.81	0.24	0.05	0.04	0.03	< 0.01	4.56	98.5
15: B HGO-PAG-Zn-DUP	83.2	7.68	3.19	0.45	1.19	2.62	0.42	0.20	0.04	0.03	0.06	< 0.01	1.94	101.0
16: B OB-ML- DUP	65.8	13.7	6.89	2.39	2.39	3.15	1.38	1.13	0.18	0.14	0.02	0.03	2.96	100.2

OnLine LIMS

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LR Report : **CA19005-DEC22**

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SFE 3:1 ratio 24hr (MEND) prefilter pH - Please use only 100g to SFE

29-December-2022

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 01 December 2022
LR Report: **CA19004-DEC22**
Reference: Berry Composites- Set 1- As Rec'd

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG	6: B SED-High SFE	7: B QTP-PAG	8: B LGO-PAG	9: B HGO-PAG-Zn	10: B OB-ML
Sample weight [g]	08-Dec-22	11:42	09-Dec-22	15:19	100	100	100	100	100	100
Volume D.I. Water [mL]	08-Dec-22	11:42	09-Dec-22	15:19	300	300	300	300	300	300
Final pH [no unit]	09-Dec-22	10:39	09-Dec-22	15:19	8.72	9.08	9.04	8.49	8.99	7.51
pH [No unit]	12-Dec-22	07:52	13-Dec-22	11:36	7.52	7.55	7.60	7.60	7.61	7.88
Conductivity [uS/cm]	12-Dec-22	07:52	13-Dec-22	11:36	142	113	122	238	110	399
Alkalinity [mg/L as CaCO3]	12-Dec-22	07:52	13-Dec-22	11:36	35	38	31	39	35	86
Fluoride [mg/L]	15-Dec-22	09:17	15-Dec-22	12:33	0.11	0.16	< 0.06	0.06	< 0.06	0.06
Sulphate [mg/L]	16-Dec-22	20:37	22-Dec-22	15:55	20	7.8	20	54	11	110
Silver [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.00005	< 0.00005	< 0.00005	0.00008	< 0.00005	< 0.00005
Aluminum [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.431	0.446	0.655	0.385	0.623	0.070
Arsenic [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.0008	0.0007	0.0011	0.0002	0.0012	0.0077
Barium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.00081	0.00392	0.00228	0.00174	0.00097	0.0434
Boron [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.018	0.026	0.033	0.017	0.020	0.003
Beryllium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
Bismuth [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00008	< 0.00001
Calcium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	15.8	9.94	14.8	33.2	13.4	74.0
Cadmium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.000005	0.000018	< 0.000003	< 0.000003	< 0.000003	0.000075
Cobalt [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.000024	0.000014	0.000030	0.000039	0.000020	0.000314
Chromium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.00008	0.00009	< 0.00008	< 0.00008	< 0.00008	0.00041
Copper [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.0014	0.0004	0.0005	0.0005	0.0003	0.0077

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SFE 3:1 ratio 24hr (MEND) prefilter pH - Please use only 100g to SFE

LR Report : **CA19004-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG	6: B SED-High SFE	7: B QTP-PAG	8: B LGO-PAG	9: B HGO-PAG-Zn	10: B OB-ML
Iron [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.017	0.017	0.011	< 0.007	0.018	0.077
Potassium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	2.64	6.90	3.00	3.03	2.47	2.04
Lithium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.0006	0.0002	0.0002	0.0005	0.0002	0.0003
Magnesium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	1.34	1.33	0.978	1.86	0.947	4.44
Manganese [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.0245	0.00185	0.00399	0.0174	0.00426	0.349
Molybdenum [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.00915	0.0680	0.00414	0.00393	0.00193	0.0134
Sodium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	8.04	5.02	5.57	7.22	5.11	1.63
Nickel [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.0006	0.0004	0.0005	0.0004	0.0004	0.0015
Lead [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Antimony [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0018	0.0031
Selenium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.00040	0.00008	0.00028	0.00032	0.00028	0.00356
Tin [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006
Silicon [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	2.16	2.21	2.22	1.67	2.23	2.36
Strontium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.0124	0.104	0.0368	0.0499	0.0355	0.145
Titanium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.00071	0.00085	0.00042	0.00027	0.00083	0.00363
Thallium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	0.000016
Uranium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.000103	0.000223	0.000098	0.000099	0.000159	0.006734
Vanadium [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	0.00022	0.00273	0.00111	0.00022	0.00103	0.00407
Zinc [mg/L]	10-Dec-22	19:04	13-Dec-22	09:41	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

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OnLine LIMS

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Lakefield - Ontario - KOL 2HO
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Method Descriptions

Parameter	SGS Method Code	Reference Method Code
Alkalinity	ME-CA-[ENV]EWL-LAK-AN-006	SM 2320
Anions by IC	ME-CA-[ENV]IC-LAK-AN-001	EPA300/MA300-Ions1.3
Conductivity	ME-CA-[ENV]EWL-LAK-AN-006	SM 2510
Fluoride by Specific Ion Electrode	ME-CA-[ENV]EWL-LAK-AN-014	SM 4500
Metals in aqueous samples - ICP-MS	ME-CA-[ENV]SPE-LAK-AN-006	SM 3030/EPA 200.8
pH	ME-CA-[ENV]EWL-LAK-AN-006	SM 4500

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SFE 3:1 ratio 24hr (MEND) prefilter pH - Please use only 100g to SFE

LR Report : **CA19004-DEC22**

Quality Control Report

Inorganic Analysis														
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material			
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)		
							%		Low	High		Low	High	
Alkalinity - QCBatchID: EWL0194-DEC22														
Alkalinity	2	mg/L as Ca	< 2			0	20	106	80	120	NA			
Alkalinity - QCBatchID: EWL0211-DEC22														
Alkalinity	2	mg/L as Ca	< 2			1	20	100	80	120	NA			
Anions by IC - QCBatchID: DIO0423-DEC22														
Sulphate	0.2	mg/L	<0.2			1	20	94	90	110	93	75	125	
Anions by IC - QCBatchID: DIO0479-DEC22														
Sulphate	0.2	mg/L	<0.2			0	20	102	90	110	NV	75	125	
Conductivity - QCBatchID: EWL0194-DEC22														
Conductivity	2	uS/cm	< 2			1	20	99	90	110	NA			
Conductivity - QCBatchID: EWL0211-DEC22														
Conductivity	2	uS/cm	< 2			1	20	98	90	110	NA			
Fluoride by Specific Ion Electrode - QCBatchID: EWL0252-DEC22														
Fluoride	0.06	mg/L	<0.06			ND	10	103	90	110	NV	75	125	
Metals - QCBatchID: EMS0083-DEC22														
Cobalt	0.000004	mg/L	<0.000004			0	20	97	90	110	102	70	130	
Metals in aqueous samples - ICP-MS - QCBatchID: EMS0083-DEC22														
Aluminum	0.001	mg/L	<0.001			0	20	102	90	110	113	70	130	
Antimony	0.0009	mg/L	<0.0009			ND	20	98	90	110	85	70	130	
Arsenic	0.0002	mg/L	<0.0002			0	20	98	90	110	103	70	130	
Barium	0.00008	mg/L	<0.00002			0	20	100	90	110	100	70	130	
Beryllium	0.000007	mg/L	<0.000007			ND	20	95	90	110	104	70	130	
Bismuth	0.00001	mg/L	<0.00001			ND	20	99	90	110	91	70	130	
Boron	0.002	mg/L	<0.002			0	20	90	90	110	80	70	130	
Cadmium	0.000003	mg/L	<0.000003			0	20	100	90	110	101	70	130	
Calcium	0.01	mg/L	<0.01			3	20	99	90	110	102	70	130	
Chromium	0.00008	mg/L	<0.00008			0	20	97	90	110	89	70	130	
Copper	0.0002	mg/L	<0.0002			0	20	98	90	110	95	70	130	
Iron	0.007	mg/L	<0.007			0	20	100	90	110	100	70	130	
Lead	0.00009	mg/L	<0.00001			0	20	100	90	110	98	70	130	
Lithium	0.0001	mg/L	<0.0001			0	20	92	90	110	92	70	130	
Magnesium	0.001	mg/L	<0.001			2	20	101	90	110	102	70	130	
Manganese	0.00001	mg/L	<0.00001			0	20	104	90	110	100	70	130	
Molybdenum	0.00004	mg/L	<0.00004			0	20	91	90	110	93	70	130	
Nickel	0.0001	mg/L	<0.0001			0	20	96	90	110	90	70	130	
Potassium	0.003	mg/L	<0.009			0	20	104	90	110	98	70	130	

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SFE 3:1 ratio 24hr (MEND) prefilter pH - Please use only 100g to SFE

LR Report : **CA19004-DEC22**

Inorganic Analysis													
Parameter	Reporting Limit	Unit	Method Blank	Duplicate				LCS / Spike Blank			Matrix Spike / Reference Material		
				Result 1	Result 2	RPD	Acceptance Criteria	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
							%		Low	High		Low	High
Selenium	0.00004	mg/L	<0.00004			ND	20	103	90	110	101	70	130
Silicon	0.02	mg/L	<0.02			0	20	94	90	110	NV	70	130
Silver	0.00005	mg/L	<0.00005			ND	20	100	90	110	85	70	130
Sodium	0.01	mg/L	<0.01			4	20	101	90	110	98	70	130
Strontium	0.00008	mg/L	<0.00002			0	20	100	90	110	102	70	130
Thallium	0.000005	mg/L	<0.000005			ND	20	99	90	110	98	70	130
Tin	0.00006	mg/L	<0.00006			0	20	90	90	110	NV	70	130
Titanium	0.00005	mg/L	<0.00005			0	20	92	90	110	NV	70	130
Uranium	0.000002	mg/L	<0.000002			0	20	91	90	110	93	70	130
Vanadium	0.00001	mg/L	<0.00001			0	20	98	90	110	110	70	130
Zinc	0.002	mg/L	<0.002			0	20	97	90	110	93	70	130
pH - QCBatchID: EWL0194-DEC22													
pH	0.05	No unit	NA			0		100			NA		
pH - QCBatchID: EWL0211-DEC22													
pH	0.05	No unit	NA			0		100			NA		

OnLine LIMS

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19-January-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 09 January 2023
LR Report: **CA19050-JAN23**
Reference: Berry Composites - Set 2

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR dup	6: B SED dup	7: B MD dup	8: B QTP dup	9: B LGO dup	10: B HGO dup
Sample Date & Time					N/A	N/A	N/A	N/A	N/A	N/A
Hg MS [ug/g]	15-Jan-23	01:13	17-Jan-23	11:08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ag [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	< 1	< 1	< 1	< 1	< 1	< 1
As [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	7.5	3.0	5.9	2.2	3.6	1.7
Al [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	9000	11000	33000	7600	7100	7700
Ba [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	20	86	18	9.7	15	10
Be [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	0.089	0.25	0.29	0.076	0.069	0.054
Bi [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	0.19	0.097	< 0.09	0.16	0.59	1.3
Ca [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	11000	19000	32000	9700	14000	11000
Cd [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	0.17	0.081	0.13	0.060	0.055	0.049
Co [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	3.7	7.7	25	4.6	20	4.8
Cr [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	3.2	11	63	7.4	4.1	6.7
Cu [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	19	39	43	27	26	22
Fe [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	22000	20000	67000	20000	30000	26000
K [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	630	690	450	390	560	310
Li [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	2.1	4.3	6.7	2.0	< 2	< 2
Mg [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	2900	7000	22000	2700	2400	2600
Mn [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	400	730	1000	400	520	400
Mo [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	2.3	0.39	1.2	2.7	1.6	2.9
Na [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	770	390	310	660	600	700

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Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR dup	6: B SED dup	7: B MD dup	8: B QTP dup	9: B LGO dup	10: B HGO dup
Ni [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	1.5	12	22	2.6	2.5	3.1
P [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	180	260	560	170	150	160
Pb [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	1.5	1.9	5.2	1.0	6.1	2.1
Sb [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	< 6	< 6	< 6	< 6	< 6	< 6
Se [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Sn [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	< 2	< 2	< 2	< 2	< 2	< 2
Sr [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	9.6	36	50	12	15	13
Ti [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	76	41	740	61	33	48
Tl [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
U [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	0.15	0.75	0.17	0.13	0.12	0.12
V [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	7.8	23	110	8.6	7.3	9.1
Y [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	7.4	8.0	14	6.5	6.0	6.7
Zn [µg/g]	15-Jan-23	01:13	17-Jan-23	11:08	31	35	87	29	28	27

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<original signed by>

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ABA - Modified Sobek

19-January-2023

Marathon Gold Corp
Attn : James Powell

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Phone: 709-730-5046
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Date Rec. : 07 December 2022
LR Report: **CA19063-DEC22**
Reference: Berry Composites - Set 2

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR	6: B SED	7: B MD	8: B QTP	9: B LGO	10: B HGO
Sample Date & Time					N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	03-Jan-23	08:07	05-Jan-23	15:38	9.46	9.21	8.88	9.45	9.02	9.48
Fizz Rate [rating]	03-Jan-23	08:07	05-Jan-23	15:38	2	3	3	2	2	2
Sample weight [g]	03-Jan-23	08:07	05-Jan-23	15:38	1.98	2.03	2.05	2.05	2.00	2.03
HCl_add [mL]	03-Jan-23	08:07	05-Jan-23	15:38	30.00	60.00	75.00	30.00	35.00	30.00
HCl [Normality]	03-Jan-23	08:07	05-Jan-23	15:38	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	03-Jan-23	08:07	05-Jan-23	15:38	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	03-Jan-23	08:07	05-Jan-23	15:38	15.77	24.99	34.15	17.30	17.79	15.61
Final pH [no unit]	03-Jan-23	08:07	05-Jan-23	15:38	1.55	1.59	1.63	1.42	1.43	1.52
NP [t CaCO3/1000 t]	03-Jan-23	08:07	05-Jan-23	15:38	35.9	86.2	99.6	31.0	43.0	35.4
AP [t CaCO3/1000 t]	05-Jan-23	15:38	05-Jan-23	15:39	7.50	1.25	6.88	7.81	60.0	23.8
Net NP [t CaCO3/1000 t]	05-Jan-23	15:38	05-Jan-23	15:39	28.4	85.0	92.7	23.2	-17.00	11.6
NP/AP [ratio]	05-Jan-23	15:38	05-Jan-23	15:39	4.79	69.0	14.5	3.97	0.72	1.49
S [%]	15-Dec-22	10:29	05-Jan-23	11:28	0.285	0.023	0.240	0.282	1.91	0.767
Acid Leachable SO4-S [%]	05-Jan-23	11:28	05-Jan-23	11:28	0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Sulphide [%]	20-Dec-22	09:24	05-Jan-23	11:28	0.24	< 0.04	0.22	0.25	1.92	0.76

OnLine LIMS

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ABA - Modified Sobek

LR Report : **CA19063-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR	6: B SED	7: B MD	8: B QTP	9: B LGO	10: B HGO
C [%]	15-Dec-22	10:29	19-Dec-22	12:09	0.414	1.05	1.06	0.353	0.497	0.400
CO3 (HCl) as %CO3 [%]	19-Dec-22	07:49	19-Dec-22	12:09	1.98	5.16	5.24	1.70	2.32	1.93

*NP (Neutralization Potential)

$$= \frac{50 \times (N \text{ of HCL} \times \text{Total HCL added} - N \text{ NaOH} \times \text{NaOH added})}{\text{Weight of Sample}}$$

*AP (Acid Potential) = % Sulphide Sulphur x 31.25
*Net NP (Net Neutralization Potential) = NP-AP
NP/AP Ratio = NP/AP
*Results expressed as tonnes CaCO3 equivalent/1000 tonnes of material
Samples with a % Sulphide value of <0.04 will be calculated using a 0.04 value.

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19-January-2023

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Date Rec. : 08 December 2022
LR Report: **CA19103-DEC22**
Reference: Berry Composites - Set 3- As Rec'd

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B-QPOR_FB	6: B-CG_FB	7: M-MD_FB	8: B-QTP_FB	9: B-LGO_FB	10: B-HGO_FB
Sample Date & Time					N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	04-Jan-23	09:58	06-Jan-23	09:13	9.45	9.35	9.07	9.40	9.43	9.34
Fizz Rate [rating]	04-Jan-23	09:58	06-Jan-23	09:13	4	4	4	3	3	4
Sample weight [g]	04-Jan-23	09:58	06-Jan-23	09:13	2.05	1.95	1.95	1.97	1.99	1.94
HCl_add [mL]	04-Jan-23	09:58	06-Jan-23	09:13	40.00	54.00	76.30	26.80	26.70	40.00
HCl [Normality]	04-Jan-23	09:58	06-Jan-23	09:13	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	04-Jan-23	09:58	06-Jan-23	09:13	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	04-Jan-23	09:58	06-Jan-23	09:13	21.17	20.00	28.11	11.77	11.38	25.08
Final pH [no unit]	04-Jan-23	09:58	06-Jan-23	09:13	1.46	1.63	1.64	1.58	1.59	1.26
NP [t CaCO3/1000 t]	04-Jan-23	09:58	06-Jan-23	09:13	45.9	87.2	124	38.1	38.5	38.4
AP [t CaCO3/1000 t]	06-Jan-23	16:32	06-Jan-23	16:33	7.19	1.25	3.12	7.19	15.0	18.8
Net NP [t CaCO3/1000 t]	06-Jan-23	16:32	06-Jan-23	16:33	38.7	86.0	120	30.9	23.5	19.6
NP/AP [ratio]	06-Jan-23	16:32	06-Jan-23	16:33	6.39	69.8	39.6	5.30	2.57	2.05
S [%]	05-Jan-23	13:25	06-Jan-23	16:32	0.277	0.009	0.130	0.271	0.569	0.668
Acid Leachable SO4-S [%]	06-Jan-23	16:32	06-Jan-23	16:32	0.05	<0.04	< 0.04	0.04	0.09	0.07
Sulphide [%]	06-Jan-23	14:09	06-Jan-23	16:32	0.23	< 0.04	0.10	0.23	0.48	0.60

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ABA - Modified Sobek

LR Report : **CA19103-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B-QPOR_FB	6: B-CG_FB	7: M-MD_FB	8: B-QTP_FB	9: B-LGO_FB	10: B-HGO_FB
C [%]	05-Jan-23	13:25	06-Jan-23	15:17	0.561	1.10	1.50	0.453	0.475	0.446
CO3 (HCl) [%]	06-Jan-23	11:06	06-Jan-23	15:17	2.66	5.38	7.39	2.14	2.24	2.07
	08-Dec-22	---	08-Dec-22	---	1	1	1	1	1	1
Weight [g]	20-Dec-22	---	20-Dec-22	---	5034	5012	5021	5024	5067	5035
Split	20-Dec-22	---	20-Dec-22	---	1	1	1	1	1	1
CRU24 [kg]	20-Dec-22	---	20-Dec-22	---	2.0	2.0	2.0	2.0	2.1	2.0
Pulv200M [250g]	20-Dec-22	---	20-Dec-22	---	1	1	1	1	1	1

Analysis	11: B-QPOR_FB DUP	12: B-CG_FB DUP	13: M-MD_FB DUP	14: B-QTP_FB DUP	15: B-LGO_FB DUP	16: B-HGO_FB DUP
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	9.48	9.35	9.06	9.43	9.43	9.29
Fizz Rate [rating]	3	4	4	3	3	4
Sample weight [g]	2.05	2.07	1.90	2.08	2.07	2.03
HCl_add [mL]	35.20	51.80	75.70	28.10	28.30	40.00
HCl [Normality]	0.10	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	16.53	15.32	26.37	12.47	12.18	24.31
Final pH [no unit]	1.58	1.84	1.64	1.61	1.53	1.24
NP [t CaCO3/1000 t]	45.5	88.1	130	37.6	38.9	38.7
AP [t CaCO3/1000 t]	6.56	1.25	2.81	6.88	14.4	18.4
Net NP [t CaCO3/1000 t]	38.9	86.8	127	30.7	24.5	20.3
NP/AP [ratio]	6.93	70.5	46.2	5.47	2.71	2.10
S [%]	0.265	0.009	0.134	0.273	0.549	0.652
Acid Leachable SO4-S [%]	0.06	<0.04	0.04	0.05	0.09	0.06
Sulphide [%]	0.21	< 0.04	0.09	0.22	0.46	0.59
C [%]	0.564	1.11	1.52	0.452	0.474	0.447

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Analysis	11: B-QPOR_FB DUP	12: B-CG_FB DUP	13: M-MD_FB DUP	14: B-QTP_FB DUP	15: B-LGO_FB DUP	16: B-HGO_FB DUP
CO3 (HCl) [%]	2.65	5.41	7.45	2.12	2.23	2.10
	1	1	1	1	1	1
Weight [g]	---	---	---	---	---	---
Split	---	---	---	---	---	---
CRU24 [kg]	---	---	---	---	---	---
Pulv200M [250g]	---	---	---	---	---	---

*NP (Neutralization Potential)
= 50 x (N of HCL x Total HCL added - N NaOH x NaOH added)

Weight of Sample

*AP (Acid Potential) = % Sulphide Sulphur x 31.25
*Net NP (Net Neutralization Potential) = NP-AP
NP/AP Ratio = NP/AP
*Results expressed as tonnes CaCO3 equivalent/1000 tonnes of material
Samples with a % Sulphide value of <0.04 will be calculated using a 0.04 value.

<original signed by>

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OnLine LIMS

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19-January-2023

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Date Rec. : 08 December 2022
LR Report: **CA19104-DEC22**
Reference: Berry Composites- Set 3- As Rec'd

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B-QPOR_FB	6: B-CG_FB	7: M-MD_FB	8: B-QTP_FB	9: B-LGO_FB	10: B-HGO_FB	11: B-QPOR_FB DUP	12: B-CG_FB DUP	13: M-MD_FB DUP
Sample Date & Time					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prep-Env AR [Prep]	11-Jan-23	14:56	17-Jan-23	11:33	1	1	1	1	1	1	1	1	1
Hg MS [ug/g]	14-Jan-23	13:46	17-Jan-23	11:33	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ag [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
As [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	0.81	1.4	20	1.1	1.2	1.7	0.76	1.4	12
Al [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	12000	12000	24000	9800	8000	7900	12000	12000	24000
Ba [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	14	41	15	12	11	9.3	14	42	15
Be [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	0.074	0.20	0.18	0.054	0.048	0.058	0.070	0.19	0.17
Bi [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	< 0.09	0.093	< 0.09	0.11	0.45	1.2	< 0.09	< 0.09	< 0.09
Ca [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	15000	27000	38000	13000	13000	13000	14000	26000	38000
Cd [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	0.050	0.065	0.10	0.21	0.044	0.12	0.049	0.062	0.087
Co [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	7.4	9.9	20	3.8	5.4	4.3	6.6	9.9	20
Cr [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	56	45	62	76	56	82	56	45	63
Cu [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	26	16	31	16	73	15	22	16	31
Fe [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	26000	29000	52000	23000	24000	22000	26000	28000	53000
K [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	420	630	390	400	400	310	420	620	390
Li [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	3.5	5.0	5.2	2.1	< 2	< 2	2.8	4.4	4.8
Mg [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	5300	9600	16000	3200	2900	3000	5100	9400	17000
Mn [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	480	780	1000	460	440	430	480	780	1100
Mo [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	0.62	0.31	0.56	0.78	0.92	1.9	0.62	0.26	0.45

OnLine LIMS

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Trace Metals - Aqua Regia Digest, ICP-MS

LR Report : **CA19104-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B-QPOR_FB	6: B-CG_FB	7: M-MD_FB	8: B-QTP_FB	9: B-LGO_FB	10: B-HGO_FB	11: B-QPOR_FB DUP	12: B-CG_FB DUP	13: M-MD_FB DUP
Na [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	530	370	280	430	410	410	530	360	280
Ni [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	22	16	15	2.6	4.2	3.8	6.7	16	15
P [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	240	500	530	210	170	180	220	480	520
Pb [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	0.94	2.0	1.3	1.6	15	3.8	0.93	2.0	1.2
Sb [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Se [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Sn [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sr [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	15	38	46	12	13	14	15	38	47
Ti [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	110	320	370	79	43	39	93	290	370
Tl [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
U [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	0.13	0.79	0.12	0.12	0.10	0.10	0.12	0.74	0.12
V [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	20	37	100	9.8	9.3	9.8	20	36	100
Y [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	6.1	9.7	11	6.9	5.7	5.9	6.1	9.6	11
Zn [µg/g]	14-Jan-23	13:46	17-Jan-23	11:33	44	58	85	49	31	34	47	61	87

Analysis	14: B-QTP_FB DUP	15: B-LGO_FB DUP	16: B-HGO_FB DUP
Sample Date & Time	N/A	N/A	N/A
Prep-Env AR [Prep]	1	1	1
Hg MS [ug/g]	< 0.05	< 0.05	< 0.05
Ag [µg/g]	< 1	< 1	< 1
As [µg/g]	1.1	1.2	1.8
Al [µg/g]	9800	7900	8000
Ba [µg/g]	12	12	9.8
Be [µg/g]	0.056	0.054	0.058
Bi [µg/g]	0.10	0.33	1.2
Ca [µg/g]	13000	13000	13000
Cd [µg/g]	0.23	0.054	0.12
Co [µg/g]	3.8	5.1	4.6
Cr [µg/g]	74	58	84
Cu [µg/g]	17	73	15
Fe [µg/g]	23000	24000	22000
K [µg/g]	390	390	310
Li [µg/g]	2.1	< 2	< 2

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Analysis	14: B-QTP_FB DUP	15: B-LGO_FB DUP	16: B-HGO_FB DUP
Mg [µg/g]	3200	2900	3000
Mn [µg/g]	460	440	440
Mo [µg/g]	0.79	0.96	2.0
Na [µg/g]	420	410	420
Ni [µg/g]	2.5	3.8	4.5
P [µg/g]	220	160	180
Pb [µg/g]	1.6	15	4.0
Sb [µg/g]	< 6	< 6	< 6
Se [µg/g]	< 0.7	< 0.7	< 0.7
Sn [µg/g]	< 2	< 2	< 2
Sr [µg/g]	12	13	14
Ti [µg/g]	75	41	40
Tl [µg/g]	< 0.02	< 0.02	< 0.02
U [µg/g]	0.12	0.12	0.10
V [µg/g]	9.7	9.3	10
Y [µg/g]	6.9	5.7	6.1
Zn [µg/g]	51	32	36

<original signed by>

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19-January-2023

Marathon Gold Corp
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Date Rec. : 08 December 2022
LR Report: **CA19105-DEC22**
Reference: Berry Composites- Set 3- As Rec'd

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B-QPOR_FB	6: B-CG_FB	7: M-MD_FB	8: B-QTP_FB	9: B-LGO_FB	10: B-HGO_FB	11: B-QPOR_FB DUP	12: B-CG_FB DUP
Sample Date & Time					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sample weight [g]	22-Dec-22	08:30	23-Dec-22	11:55	250	250	250	250	250	251	252	250
Volume D.I. Water [mL]	22-Dec-22	08:30	23-Dec-22	11:55	750	750	750	750	750	750	750	750
Final pH [no unit]	23-Dec-22	06:38	23-Dec-22	11:55	9.02	9.16	8.90	9.08	9.20	8.98	9.12	9.24
pH [No unit]	23-Dec-22	11:05	29-Dec-22	15:54	8.00	8.20	8.02	7.87	7.99	7.87	8.01	8.16
Conductivity [uS/cm]	23-Dec-22	11:05	29-Dec-22	15:54	86	89	83	81	79	97	90	88
Alkalinity [mg/L as CaCO3]	23-Dec-22	11:05	29-Dec-22	15:54	35	40	40	29	31	31	38	41
F [mg/L]	27-Dec-22	08:10	28-Dec-22	09:19	0.07	0.11	< 0.06	0.06	< 0.06	< 0.06	0.07	0.11
SO4 [mg/L]	28-Dec-22	21:35	06-Jan-23	16:13	4.4	3.2	< 2	3.8	3.0	8.9	4.4	3.0
Hg [mg/L]	29-Dec-22	06:34	29-Dec-22	17:02	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	1.01	0.927	0.761	1.19	1.26	0.972	0.986	0.984
As [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.0047	0.0020	0.0018	0.0018	0.0027	0.0013	0.0018	0.0018
Ba [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.00073	0.00375	0.00183	0.00074	0.00066	0.00113	0.00066	0.00331
B [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.010	0.026	0.022	0.056	0.028	0.049	0.018	0.013
Be [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	0.000007
Bi [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	7.99	5.91	8.91	8.00	7.92	11.2	8.01	5.86
Cd [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003
Co [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.000022	0.000011	0.000006	0.000006	0.000018	0.000014	< 0.000004	0.000006

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SFE 3:1 ratio 24hr (MEND) prefilter pH

LR Report : **CA19105-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B-QPOR_FB	6: B-CG_FB	7: M-MD_FB	8: B-QTP_FB	9: B-LGO_FB	10: B-HGO_FB	11: B-QPOR_FB DUP	12: B-CG_FB DUP
Cr [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00090	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.0003	0.0004	< 0.0002	0.0002	0.0007	0.0002	0.0003	0.0004
Fe [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.007	< 0.007	< 0.007	0.010	0.015	< 0.007	< 0.007	< 0.007
K [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	2.25	5.24	3.01	3.02	2.78	3.01	2.33	5.27
Li [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.0011	0.0003	0.0002	0.0002	0.0006	0.0003	0.0009	0.0003
Mg [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.809	0.958	1.67	0.651	0.607	0.899	0.823	0.965
Mn [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.00224	0.00148	0.00145	0.00162	0.00204	0.00240	0.00183	0.00131
Mo [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.00110	0.00060	0.00113	0.00325	0.00165	0.00311	0.00183	0.00054
Na [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	8.34	9.33	4.48	5.65	5.94	6.05	9.04	9.93
Ni [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.0005	0.0004	0.0002	0.0003	0.0007	0.0001	0.0002	0.0001
Pb [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0009	< 0.0009	< 0.0009
Se [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.00032	0.00005	0.00011	0.00006	0.00012	0.00014	0.00017	< 0.00004
Sn [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006
Si [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	2.03	1.85	1.03	1.83	2.12	1.55	1.67	2.40
Sr [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.0102	0.0652	0.0232	0.0147	0.0143	0.0252	0.0103	0.0659
Ti [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.00014	0.00015	0.00018	0.00020	0.00038	0.00007	0.00015	0.00013
Tl [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.000107	0.000274	0.000010	0.000075	0.000099	0.000098	0.000110	0.000274
V [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	0.00225	0.00511	0.00171	0.00199	0.00195	0.00171	0.00235	0.00538
Zn [mg/L]	29-Dec-22	17:19	30-Dec-22	13:47	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
pH Check <2 [pH]	28-Dec-22	12:25	30-Dec-22	13:47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Analysis	13: M-MD_FB DUP	14: B-QTP_FB DUP	15: B-LGO_FB DUP	16: B-HGO_FB DUP
Sample Date & Time	N/A	N/A	N/A	N/A
Sample weight [g]	250	250	249	250
Volume D.I. Water [mL]	750	750	750	750
Final pH [no unit]	8.89	9.04	9.11	8.93
pH [No unit]	7.99	8.09	8.08	7.89
Conductivity [uS/cm]	82	88	78	97
Alkalinity [mg/L as CaCO3]	38	55	31	32
F [mg/L]	< 0.06	< 0.06	< 0.06	< 0.06
SO4 [mg/L]	< 2	4.6	2.7	8.1

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Analysis	13: M-MD_FB DUP	14: B-QTP_FB DUP	15: B-LGO_FB DUP	16: B-HGO_FB DUP
Hg [mg/L]	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	0.797	1.15	1.22	1.00
As [mg/L]	0.0016	0.0019	0.0019	0.0014
Ba [mg/L]	0.00174	0.00083	0.00058	0.00086
B [mg/L]	0.012	0.033	0.025	0.044
Be [mg/L]	< 0.000007	< 0.000007	< 0.000007	< 0.000007
Bi [mg/L]	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	8.68	8.31	7.95	10.5
Cd [mg/L]	< 0.000003	< 0.000003	< 0.000003	< 0.000003
Co [mg/L]	0.000005	0.000015	0.000006	0.000015
Cr [mg/L]	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	0.0002	0.0003	< 0.0002	< 0.0002
Fe [mg/L]	< 0.007	< 0.007	< 0.007	< 0.007
K [mg/L]	3.05	3.38	2.59	2.82
Li [mg/L]	0.0003	0.0003	0.0005	0.0003
Mg [mg/L]	1.64	0.792	0.566	0.851
Mn [mg/L]	0.00142	0.00175	0.00153	0.00216
Mo [mg/L]	0.00099	0.00321	0.00135	0.00262
Na [mg/L]	4.63	6.74	5.11	5.79
Ni [mg/L]	0.0001	0.0002	< 0.0001	0.0002
Pb [mg/L]	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	0.00017	0.00006	0.00013	0.00009
Sn [mg/L]	< 0.00006	< 0.00006	< 0.00006	< 0.00006
Si [mg/L]	1.29	1.96	2.11	1.89
Sr [mg/L]	0.0225	0.0152	0.0149	0.0234
Ti [mg/L]	0.00006	0.00005	0.00019	0.00010
Tl [mg/L]	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	0.000009	0.000090	0.000103	0.000101
V [mg/L]	0.00171	0.00184	0.00188	0.00186
Zn [mg/L]	< 0.002	< 0.002	< 0.002	< 0.002
pH Check <2 [pH]	1.00	1.00	1.00	1.00

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LR Report : **CA19105-DEC22**

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Project Specialist,
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OnLine LIMS

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D.3 KINETIC TESTS

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17-February-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 07 December 2022
LR Report: **CA19070-DEC22**
Reference: Berry Composites- Set 1- NP Depleted

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP	6: B QTP-PAG-CO3DP	7: B LGO-PAG-CO3DP	8: B HGO-PAG-Zn-CO3DP	9: B QPOR-PAG-CO3DP Duplicate
Sample Date & Time					N/A	N/A	N/A	N/A	N/A
Prep-Env AR [Prep]	10-Feb-23	08:05	14-Feb-23	13:24	1	1	1	1	1
Hg MS [ug/g]	14-Feb-23	06:53	14-Feb-23	13:24	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Ag [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	< 1	< 1	< 1	2	< 1
As [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	1.6	0.98	4.8	1.1	1.7
Al [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	5100	5600	6800	6100	5300
Ba [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	16	18	18	9.8	17
Be [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	0.051	0.069	0.062	0.044	0.056
Bi [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	0.10	0.13	0.36	3.7	0.11
Ca [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	960	690	940	650	960
Cd [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	0.030	< 0.02	< 0.02	< 0.02	0.04
Co [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	13	3.9	26	6.1	13
Cr [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	2.6	1.9	2.2	2.6	2.6
Cu [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	13	8.5	150	8.3	13
Fe [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	27000	24000	61000	23000	27000
K [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	500	510	570	380	520
Li [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	< 2	< 2	< 2	< 2	< 2
Mg [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	2000	1800	2400	2200	2100
Mn [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	110	110	150	130	110
Mo [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	2.9	0.7	0.6	1.8	3.0
Ni [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	0.82	1.0	2.9	1.2	0.82
Pb [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	1.6	2.2	1.2	4.3	1.8
Sb [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	< 6	< 6	< 6	< 6	< 6
Se [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	< 0.7	< 0.7	0.8	< 0.7	< 0.7
Sn [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	< 2	< 2	< 2	< 2	< 2
Sr [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	4.1	4.5	6.1	3.4	4.1
Ti [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	22	39	17	43	22
Tl [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	< 0.02	0.046	0.024	< 0.02	< 0.02
U [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	0.084	0.10	0.079	0.071	0.094
V [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	6.6	3.2	10	7.0	6.8
Y [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	3.7	3.8	4.1	3.0	3.7
Zn [µg/g]	14-Feb-23	06:53	14-Feb-23	13:24	14	15	20	18	15

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LR Report : **CA19070-DEC22**

Analysis	10: B QTP-PAG-CO3DP Duplicate	11: B LGO-PAG-CO3DP Duplicate	12: B HGO-PAG-Zn-CO3DP Duplicate
Sample Date & Time	N/A	N/A	N/A
Prep-Env AR [Prep]	1	1	1
Hg MS [ug/g]	< 0.05	< 0.05	< 0.05
Ag [µg/g]	< 1	< 1	2
As [µg/g]	1.0	4.8	1.1
Al [µg/g]	5600	6800	6000
Ba [µg/g]	17	18	9.8
Be [µg/g]	0.062	0.060	0.042
Bi [µg/g]	0.12	0.39	3.9
Ca [µg/g]	690	910	660
Cd [µg/g]	0.02	< 0.02	< 0.02
Co [µg/g]	4.0	25	5.9
Cr [µg/g]	2.7	2.3	2.6
Cu [µg/g]	8.6	140	7.3
Fe [µg/g]	24000	60000	23000
K [µg/g]	510	570	370
Li [µg/g]	< 2	< 2	< 2
Mg [µg/g]	1800	2400	2200
Mn [µg/g]	110	140	120
Mo [µg/g]	0.9	0.7	1.8
Ni [µg/g]	1.5	2.8	1.3
Pb [µg/g]	2.2	1.1	5.9
Sb [µg/g]	< 6	< 6	< 6
Se [µg/g]	< 0.7	0.9	< 0.7
Sn [µg/g]	< 2	< 2	< 2
Sr [µg/g]	4.5	6.0	3.5
Ti [µg/g]	37	17	44
Tl [µg/g]	< 0.02	< 0.02	< 0.02
U [µg/g]	0.10	0.077	0.071
V [µg/g]	3.3	9.9	6.7
Y [µg/g]	3.8	4.0	2.9
Zn [µg/g]	15	19	18

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17-February-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 07 December 2022
LR Report: **CA19069-DEC22**
Reference: Berry Composites - Set 1-NP Depleted

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-COQ3DP	6: B TP-PAG-CO3DLP	7: B LGO-PAG-CO3DP
Sample Date & Time					N/A	N/A	N/A
Paste pH [no unit]	09-Feb-23	11:28	13-Feb-23	15:25	9.11	9.14	8.23
Fizz Rate [rating]	09-Feb-23	11:28	13-Feb-23	15:25	2	2	2
Sample weight [g]	09-Feb-23	11:28	13-Feb-23	15:25	2.03	1.91	2.02
HCl_add [mL]	224831	09:30	13-Feb-23	15:25	20.00	20.00	20.00
HCl [Normality]	09-Feb-23	11:28	13-Feb-23	15:25	0.10	0.10	0.10
NaOH [Normality]	09-Feb-23	11:28	13-Feb-23	15:25	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	10-Feb-23	11:30	13-Feb-23	15:25	18.38	18.89	18.74
Final pH [no unit]	10-Feb-23	11:30	13-Feb-23	15:25	1.13	1.18	1.21
NP [t CaCO3/1000 t]	10-Feb-23	11:30	13-Feb-23	15:25	4.0	2.9	3.1
AP [t CaCO3/1000 t]	16-Feb-23	10:50	16-Feb-23	10:51	40.6	35.3	137
Net NP [t CaCO3/1000 t]	16-Feb-23	10:50	16-Feb-23	10:51	-36.62	-32.41	-133.46
NP/AP [ratio]	16-Feb-23	10:50	16-Feb-23	10:51	0.10	0.08	0.02
S [%]	13-Feb-23	13:28	16-Feb-23	10:50	1.30	1.13	4.36
Acid Leachable SO4-S [%]	16-Feb-23	10:49	16-Feb-23	10:50	< 0.04	< 0.04	< 0.04
Sulphide [%]	15-Feb-23	12:28	16-Feb-23	10:50	1.30	1.13	4.37
C [%]	13-Feb-23	13:28	15-Feb-23	15:03	0.151	0.098	0.129
CO3 (HCl) as %CO3 [%]	15-Feb-23	10:59	15-Feb-23	15:03	0.26	0.21	0.20

Analysis	8: B HGO-PAG-Zn-CO3DP	9: B QPOR-PAG-COQ3DP Duplicate	10: B TP-PAG-CO3DLP Duplicate	11: B LGO-PAG-CO3DP Duplicate	12: B HGO-PAG-Zn-CO3DP Duplicate
Sample Date & Time	N/A	N/A	N/A	N/A	N/A
Paste pH [no unit]	8.99	8.98	9.11	8.12	8.92
Fizz Rate [rating]	2	2	2	2	2
Sample weight [g]	1.95	1.88	1.99	2.09	1.92
HCl_add [mL]	20.00	20.00	20.00	20.00	20.00

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LR Report : **CA19069-DEC22**

Analysis	8: B HGO-PAG-Zn-CO3DP	9: B QPOR-PAG-COQ3DP Duplicate	10: B TP-PAG-CO3DLP Duplicate	11: B LGO-PAG-CO3DP Duplicate	12: B HGO-PAG-Zn-CO3DP Duplicate
HCl [Normality]	0.10	0.10	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	18.89	18.59	18.95	18.70	18.86
Final pH [no unit]	1.18	1.16	1.10	1.26	1.19
NP [t CaCO3/1000 t]	2.8	3.8	2.6	3.1	3.0
AP [t CaCO3/1000 t]	22.2	36.9	35.9	137	21.6
Net NP [t CaCO3/1000 t]	-19.39	-33.08	-33.34	-133.78	-18.56
NP/AP [ratio]	0.13	0.10	0.07	0.02	0.14
S [%]	0.774	1.31	1.15	4.42	0.793
Acid Leachable SO4-S [%]	0.06	0.13	< 0.04	0.04	0.10
Sulphide [%]	0.71	1.18	1.15	4.38	0.69
C [%]	0.045	0.145	0.092	0.121	0.050
CO3 (HCl) as %CO3 [%]	0.07	0.23	0.09	0.18	0.11

$$*NP = \frac{50 \times (N \text{ of HCL} \times \text{Total HCL added} - N\ NaOH \times NaOH \text{ added})}{\text{Weight of Sample}}$$

*AP (Acid Potential) = % Sulphide Sulphur x 31.25
*Net NP (Net Neutralization Potential) = NP-AP
NP/AP Ratio = NP/AP
*Results expressed as tonnes CaCO3 equivalent/1000 tonnes of material
Samples with a % Sulphide value of <0.04 will be calculated using a 0.04 value.

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OnLine LIMS

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SGS Canada Inc.
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17-February-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 07 December 2022
LR Report: **CA19071-DEC22**
Reference: Berry Composites- Set 1-NP Depleted

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP	6: B QTP-PAG-CO3DP	7: B LGO-PAG-CO3DP	8: B HGO-PAG-Zn-CO3DP
Sample Date & Time					N/A	N/A	N/A	N/A
Sample weight [g]	06-Feb-23	14:04	08-Feb-23	09:52	50	51	50	50
Volume D.I. Water [mL]	06-Feb-23	14:04	08-Feb-23	09:52	150	150	150	150
Final pH [no unit]	07-Feb-23	19:04	08-Feb-23	09:52	5.87	5.90	5.23	6.27
pH [No unit]	08-Feb-23	07:53	08-Feb-23	15:45	6.15	6.46	5.77	6.26
Conductivity [uS/cm]	08-Feb-23	07:53	08-Feb-23	15:45	15	14	32	9
Alkalinity [mg/L as CaCO3]	08-Feb-23	07:53	08-Feb-23	15:45	2	2	< 2	2
F [mg/L]	08-Feb-23	08:49	08-Feb-23	12:28	< 0.06	< 0.06	< 0.06	< 0.06
SO4 [mg/L]	08-Feb-23	11:14	13-Feb-23	14:13	3.1	3.0	10.0	2.1
Hg [mg/L]	09-Feb-23	12:35	10-Feb-23	13:07	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.088	0.112	0.018	0.097
As [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.0004	0.0004	< 0.0002	0.0005
Ba [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00042	0.00042	0.00080	0.00034
B [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.034	0.007	0.013	0.028
Be [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.000038	< 0.000007	0.000012	< 0.000007
Bi [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	< 0.00001	< 0.00001	< 0.00001	0.00001
Ca [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.12	0.12	1.72	0.06
Cd [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.000069	0.000048	< 0.000003	< 0.000003
Co [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.000358	0.000212	0.00188	0.000167
Cr [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00025	0.00029	< 0.00008	< 0.00008
Cu [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.0020	0.0025	0.0073	0.0009
Fe [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.061	0.068	0.048	0.069
K [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.278	0.231	0.546	0.124
Li [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.0007	0.0005	0.0006	0.0003
Mg [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.036	0.046	0.266	0.026
Mn [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00338	0.00969	0.0412	0.00089
Mo [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00129	0.00067	0.00049	0.00073
Na [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	2.47	1.98	2.61	1.71
Ni [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.0005	0.0008	0.0030	0.0003
Pb [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00140	0.00064	0.00004	< 0.00004

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LR Report : **CA19071-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP	6: B QTP-PAG-CO3DP	7: B LGO-PAG-CO3DP	8: B HGO-PAG-Zn-CO3DP
Sn [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	< 0.00006	< 0.00006	< 0.00006	< 0.00006
Si [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	3.25	3.36	2.99	2.68
Sr [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00037	0.00088	0.00250	0.00055
Ti [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00198	0.00163	< 0.00005	0.00144
Tl [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	< 0.000002	< 0.000002	< 0.000002	< 0.000002
V [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00017	0.00011	0.00010	0.00047
W [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00044	0.00021	0.00015	0.00034
Y [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.00003	0.00005	< 0.00002	0.00003
Zn [mg/L]	10-Feb-23	16:59	14-Feb-23	11:19	0.002	0.002	0.005	0.002
pH Check <2 [pH]	09-Feb-23	16:00	14-Feb-23	11:19	1.00	1.00	1.00	1.00

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24-February-2023

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Phone: 709-730-5046
Fax:

Date Rec. : 07 December 2022
LR Report: **CA19072-DEC22**
Reference: Berry Composites - Set 1 - NP Depleted

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP	6: B QTP-PAG-CO3DLP	7: B LGO-PAG-CO3DP
Sample Date & Time					N/A	N/A	N/A
Borate Fusion [Prep]	21-Feb-23	14:35	23-Feb-23	06:13	1	1	1
SiO2 [%]	21-Feb-23	14:35	23-Feb-23	06:13	76.3	76.4	73.5
Al2O3 [%]	21-Feb-23	14:35	23-Feb-23	06:13	11.3	12.1	9.80
Fe2O3 [%]	21-Feb-23	14:35	23-Feb-23	06:13	4.01	3.43	8.49
MgO [%]	21-Feb-23	14:35	23-Feb-23	06:13	0.56	0.41	0.53
CaO [%]	21-Feb-23	14:35	23-Feb-23	06:13	0.35	0.38	0.25
Na2O [%]	21-Feb-23	14:35	23-Feb-23	06:13	4.10	4.48	2.06
K2O [%]	21-Feb-23	14:35	23-Feb-23	06:13	0.60	0.64	0.85
TiO2 [%]	21-Feb-23	14:35	23-Feb-23	06:13	0.30	0.29	0.26
P2O5 [%]	21-Feb-23	14:35	23-Feb-23	06:13	0.05	0.05	0.05
MnO [%]	21-Feb-23	14:35	23-Feb-23	06:13	0.02	0.02	0.02
Cr2O3 [%]	21-Feb-23	14:35	23-Feb-23	06:13	< 0.01	< 0.01	< 0.01
V2O5 [%]	21-Feb-23	14:35	23-Feb-23	06:13	< 0.01	< 0.01	< 0.01
LOI [%]	21-Feb-23	14:35	23-Feb-23	06:13	1.93	1.82	4.10
Sum [%]	21-Feb-23	14:35	23-Feb-23	06:13	99.5	100.0	99.9

Analysis	8: B HGO-PAG-Zn-CO3DP	9: B QPOR-PAG-CO3DP Duplicate	10: B QTP-PAG-CO3DLP Duplicate	11: B LGO-PAG-CO3DP Duplicate	12: B HGO-PAG-Zn-CO3DP Duplicate
Sample Date & Time	N/A	N/A	N/A	N/A	N/A
Borate Fusion [Prep]	1	1	1	1	1
SiO2 [%]	83.0	76.3	75.9	73.1	82.7
Al2O3 [%]	8.04	11.3	12.0	9.79	8.00
Fe2O3 [%]	3.18	4.00	3.41	8.40	3.20
MgO [%]	0.46	0.57	0.41	0.55	0.45
CaO [%]	0.26	0.35	0.38	0.25	0.27

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LR Report : **CA19072-DEC22**

Analysis	8: B HGO-PAG-Zn-CO3DP	9: B QPOR-PAG-CO3DP Duplicate	10: B QTP-PAG-CO3DLP Duplicate	11: B LGO-PAG-CO3DP Duplicate	12: B HGO-PAG-Zn-CO3DP Duplicate
Na2O [%]	2.77	4.12	4.48	2.04	2.77
K2O [%]	0.43	0.59	0.64	0.85	0.42
TiO2 [%]	0.22	0.30	0.30	0.26	0.23
P2O5 [%]	0.04	0.06	0.05	0.06	0.04
MnO [%]	0.01	< 0.01	0.02	0.01	0.02
Cr2O3 [%]	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
V2O5 [%]	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
LOI [%]	1.27	1.92	1.75	4.09	1.29
Sum [%]	99.6	99.6	99.3	99.4	99.4

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24-February-2023

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Phone: 709-730-5046
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Date Rec. : 09 January 2023
LR Report: **CA19049-JAN23**
Reference: Berry Composites - Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR dup	6: B SED dup	7: B MD dup
Sample Date & Time					N/A	N/A	N/A
Paste pH [no unit]	30-Jan-23	08:01	31-Jan-23	16:08	9.38	9.20	8.80
Fizz Rate [rating]	30-Jan-23	08:01	31-Jan-23	16:08	3	3	3
Sample weight [g]	30-Jan-23	08:01	31-Jan-23	16:08	1.98	2.10	2.09
HCl_add [mL]	30-Jan-23	08:01	31-Jan-23	16:08	30.00	55.00	75.00
HCl [Normality]	30-Jan-23	08:01	31-Jan-23	16:08	0.10	0.10	0.10
NaOH [Normality]	30-Jan-23	08:01	31-Jan-23	16:08	0.10	0.10	0.10
Vol NaOH to pH=8.3 [mL]	30-Jan-23	08:01	31-Jan-23	16:08	15.52	18.94	32.15
Final pH [no unit]	30-Jan-23	08:01	31-Jan-23	16:08	1.56	1.77	1.63
NP [t CaCO3/1000 t]	30-Jan-23	08:01	31-Jan-23	16:08	36.6	85.9	102
AP [t CaCO3/1000 t]	03-Feb-23	17:20	03-Feb-23	17:21	6.88	1.25	5.94
Net NP [t CaCO3/1000 t]	03-Feb-23	17:20	03-Feb-23	17:21	29.7	84.6	96.6
NP/AP [ratio]	03-Feb-23	17:20	03-Feb-23	17:21	5.32	68.7	17.3
S [%]	31-Jan-23	14:48	03-Feb-23	17:20	0.280	0.023	0.240
Acid Leachable SO4-S [%]	03-Feb-23	17:18	03-Feb-23	17:20	0.06	<0.04	0.05
Sulphide [%]	03-Feb-23	09:54	03-Feb-23	17:20	0.22	< 0.04	0.19
C [%]	31-Jan-23	14:48	03-Feb-23	17:20	0.408	1.05	1.07
CO3 (HCl) as %CO3 [%]	03-Feb-23	11:44	06-Feb-23	10:52	1.93	5.12	5.22

Analysis	8: B QTP dup	9: B LGO dup	10: B HGO dup
Sample Date & Time	N/A	N/A	N/A
Paste pH [no unit]	9.30	8.74	9.36
Fizz Rate [rating]	3	3	3
Sample weight [g]	2.08	2.02	2.15
HCl_add [mL]	26.00	35.00	27.00
HCl [Normality]	0.10	0.10	0.10
NaOH [Normality]	0.10	0.10	0.10

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LR Report : **CA19049-JAN23**

Analysis	8: B QTP dup	9: B LGO dup	10: B HGO dup
Vol NaOH to pH=8.3 [mL]	12.30	17.37	11.89
Final pH [no unit]	1.59	1.50	1.64
NP [t CaCO3/1000 t]	32.9	43.6	35.1
AP [t CaCO3/1000 t]	7.50	56.6	23.1
Net NP [t CaCO3/1000 t]	25.4	-12.96	12.0
NP/AP [ratio]	4.39	0.77	1.52
S [%]	0.273	1.80	0.738
Acid Leachable SO4-S [%]	< 0.04	< 0.04	< 0.04
Sulphide [%]	0.24	1.81	0.74
C [%]	0.349	0.501	0.402
CO3 (HCl) as %CO3 [%]	1.66	2.37	1.89

*NP (Neutralization Potential)

$$= \frac{50 \times (N \text{ of HCL} \times \text{Total HCL added} - N \text{ NaOH} \times \text{NaOH added})}{\text{Weight of Sample}}$$

*AP (Acid Potential) = % Sulphide Sulphur x 31.25
*Net NP (Net Neutralization Potential) = NP-AP
NP/AP Ratio = NP/AP
*Results expressed as tonnes CaCO3 equivalent/1000 tonnes of material
Samples with a % Sulphide value of <0.04 will be calculated using a 0.04 value.

<original signed by>

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Project Specialist,
Environment, Health & Safety

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24-February-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 07 December 2022
LR Report: **CA19065-DEC22**
Reference: Berry Composites - Set 2

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR	6: B SED	7: B MD	8: B QTP	9: B LGO
Sample Date & Time					N/A	N/A	N/A	N/A	N/A
Sample weight [g]	30-Jan-23	08:21	31-Jan-23	15:34	250	250	251	251	249
Volume D.I. Water [mL]	30-Jan-23	08:21	31-Jan-23	15:34	750	750	750	750	750
Final pH [no unit]	31-Jan-23	10:15	31-Jan-23	15:34	9.38	9.27	8.99	9.37	8.91
pH [No unit]	31-Jan-23	15:18	01-Feb-23	11:30	8.09	8.03	7.94	7.91	7.89
Conductivity [uS/cm]	31-Jan-23	15:18	01-Feb-23	11:30	76	88	95	87	109
Alkalinity [mg/L as CaCO3]	31-Jan-23	15:18	01-Feb-23	11:30	29	35	38	33	34
F [mg/L]	31-Jan-23	15:25	01-Feb-23	09:31	0.16	0.14	0.13	0.08	0.08
SO4 [mg/L]	03-Feb-23	17:06	21-Feb-23	15:16	< 5	11	7.8	6.6	12
Hg [mg/L]	01-Feb-23	13:15	01-Feb-23	17:10	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	1.23	0.884	0.552	0.925	0.745
As [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.0033	0.0021	0.0010	0.0016	0.0016
Ba [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.00091	0.0199	0.00258	0.00099	0.00062
B [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.005	0.019	0.013	0.048	0.029
Be [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.000039	< 0.000007	0.000036	0.000040	0.000014
Bi [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	6.97	6.68	10.6	8.05	11.0
Cd [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.000063	0.000004	0.000067	0.000049	0.000007
Co [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.000015	0.000008	0.000020	0.000020	0.000011
Cr [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.00023	< 0.00008	0.00017	0.00016	< 0.00008
Cu [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.0006	0.0008	0.0007	0.0014	0.0011
Fe [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	< 0.007	< 0.007	< 0.007	0.026	0.008
K [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	2.90	4.48	2.80	2.74	3.00
Li [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.0005	0.0006	0.0003	0.0005	0.0006
Mg [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.450	0.950	1.44	0.746	0.738
Mn [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.00112	0.00143	0.00150	0.00203	0.00517
Mo [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.00185	0.00150	0.00304	0.00572	0.00541
Na [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	5.35	6.70	3.62	5.75	6.30
Ni [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.0001	< 0.0001	0.0001	0.0002	< 0.0001
Pb [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.0013	0.0023	0.0012	0.0013	0.0017
Se [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.00109	0.00024	0.00128	0.00120	0.00018
Sn [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	< 0.00006	< 0.00006	< 0.00006	0.00007	0.00006

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LR Report : **CA19065-DEC22**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR	6: B SED	7: B MD	8: B QTP	9: B LGO
Si [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	2.38	2.07	1.39	2.46	2.18
Sr [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.0100	0.0896	0.0481	0.0258	0.0237
Ti [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.00094	0.00007	0.00111	0.00171	0.00025
Tl [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.000007	< 0.000005	0.000006	0.000008	< 0.000005
U [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.000169	0.000146	0.000022	0.000262	0.000318
V [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	0.00222	0.00416	0.00318	0.00249	0.00134
Zn [mg/L]	01-Feb-23	11:36	02-Feb-23	11:12	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Analysis	10: B HGO	11: B QPOR dup	12: B SED dup	13: B MD dup	14: B QTP dup	15: B LGO dup	16: B HGO dup	17: B QPOR
Sample Date & Time	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sample weight [g]	249	250	250	251	249	249	249	250
Volume D.I. Water [mL]	750	750	750	750	750	750	750	750
Final pH [no unit]	9.26	9.38	9.31	9.10	9.34	9.14	9.27	9.39
pH [No unit]	8.00	8.09	7.96	7.84	7.99	7.94	8.06	8.14
Conductivity [uS/cm]	97	85	90	94	88	110	98	83
Alkalinity [mg/L as CaCO3]	31	34	37	37	33	34	33	32
F [mg/L]	0.06	0.20	0.15	0.14	0.08	0.07	0.07	0.19
SO4 [mg/L]	12	< 5	5.8	5.3	6.6	11	9.1	< 5
Hg [mg/L]	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	0.891	1.08	0.926	0.551	0.918	0.804	0.960	1.13
As [mg/L]	0.0015	0.0043	0.0023	0.0008	0.0018	0.0016	0.0015	0.0044
Ba [mg/L]	0.00076	0.00088	0.0151	0.00231	0.00082	0.00069	0.00088	0.00096
B [mg/L]	0.027	0.005	0.014	0.010	0.051	0.033	0.027	0.005
Be [mg/L]	< 0.000007	0.000028	< 0.000007	0.000018	0.000059	< 0.000007	0.000035	0.000052
Bi [mg/L]	0.00002	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	0.00003	< 0.00001
Ca [mg/L]	9.15	6.96	6.54	10.2	8.09	11.0	9.38	7.13
Cd [mg/L]	0.000010	0.000030	0.000010	0.000037	0.000097	0.000008	0.000062	0.000080
Co [mg/L]	0.000012	0.000011	0.000009	0.000015	0.000037	0.000013	0.000025	0.000023
Cr [mg/L]	0.00009	0.00012	< 0.00008	0.00010	0.00028	< 0.00008	0.00027	0.00022
Cu [mg/L]	0.0021	0.0008	0.0014	0.0007	0.0014	0.0008	0.0014	0.0008
Fe [mg/L]	0.012	0.008	< 0.007	< 0.007	0.026	< 0.007	0.010	< 0.007
K [mg/L]	1.98	2.89	4.72	2.64	2.73	3.07	2.04	2.96
Li [mg/L]	0.0005	0.0007	0.0007	0.0003	0.0005	0.0005	0.0006	0.0007
Mg [mg/L]	0.627	0.509	0.935	1.35	0.754	0.757	0.647	0.509
Mn [mg/L]	0.00227	0.00129	0.00206	0.00148	0.00199	0.00487	0.00227	0.00133
Mo [mg/L]	0.00143	0.00267	0.00140	0.00340	0.00584	0.00520	0.00160	0.00244
Na [mg/L]	6.90	6.13	6.76	3.39	5.99	6.33	6.98	6.07
Ni [mg/L]	0.0001	< 0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0001
Pb [mg/L]	< 0.00009	< 0.00009	0.00012	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	0.0024	0.0017	0.0024	0.0012	0.0013	0.0016	0.0029	0.0016
Se [mg/L]	0.00021	0.00086	0.00021	0.00085	0.00168	0.00015	0.00130	0.00155
Sn [mg/L]	< 0.00006	0.00009	< 0.00006	< 0.00006	0.00008	< 0.00006	0.00006	0.00008
Si [mg/L]	2.55	2.38	2.13	1.40	2.43	2.20	2.63	2.33
Sr [mg/L]	0.0217	0.0113	0.0839	0.0474	0.0249	0.0235	0.0214	0.0116
Ti [mg/L]	0.00064	0.00059	0.00017	0.00053	0.00212	0.00013	0.00129	0.00108
Tl [mg/L]	< 0.000005	0.000005	< 0.000005	0.000005	0.000010	< 0.000005	0.000008	0.000009
U [mg/L]	0.000171	0.000203	0.000149	0.000018	0.000289	0.000246	0.000189	0.000189
V [mg/L]	0.00189	0.00219	0.00420	0.00329	0.00249	0.00130	0.00215	0.00224

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LR Report : **CA19065-DEC22**

Analysis	10: B HGO	11: B QPOR dup	12: B SED dup	13: B MD dup	14: B QTP dup	15: B LGO dup	16: B HGO dup	17: B QPOR
Zn [mg/L]	< 0.002	< 0.002	< 0.002	< 0.002	0.008	< 0.002	< 0.002	< 0.002

<original signed by>

Catharine Arnold, B.Sc., C.Chem
Project Specialist,
Environment, Health & Safety

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Marathon - Berry Set 1

Project : Berry Project

30-December-2022

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 15 December 2022
LR Report: **CA10092-DEC22**
Reference: Wk#0 - Berry Project

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#0	6: B SED-High SFE Wk#0	7: B QTP-PAG Wk#0	8: B LGO-PAG Wk#0	9: B HGO-PAG-ZnB Wk#0	10: OB-ML Wk#0
Sample Date & Time			15-Dec-22	15-Dec-22	15-Dec-22	15-Dec-22	15-Dec-22	15-Dec-22
HumCell Leachate Vol [mL]	16-Dec-22	16:49	462	521	548	513	570	318
pH [No unit]	19-Dec-22	10:07	7.47	8.88	8.44	7.60	8.50	6.84
Acidity [mg/L as CaCO3]	19-Dec-22	10:07	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	19-Dec-22	10:07	22	24	15	14	14	8
Conductivity [uS/cm]	19-Dec-22	10:07	149	34	52	128	38	214
SO4 [mg/L]	30-Dec-22	07:57	33	3.4	16	86	8.7	92
F [mg/L]	16-Dec-22	11:29	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	19-Dec-22	16:37	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	22-Dec-22	10:32	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	22-Dec-22	10:32	0.089	0.118	0.036	0.035	0.040	0.008
As [mg/L]	22-Dec-22	10:32	0.0010	0.0006	0.0005	0.0003	0.0004	0.0028
Ba [mg/L]	22-Dec-22	10:32	0.00095	0.00139	0.00102	0.00210	0.00061	0.0218
Be [mg/L]	22-Dec-22	10:32	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	22-Dec-22	10:32	0.011	0.009	0.011	0.010	0.007	0.029
Bi [mg/L]	22-Dec-22	10:32	< 0.00001	< 0.00001	< 0.00001	0.00001	0.00001	< 0.00001
Ca [mg/L]	22-Dec-22	10:32	13.5	5.31	8.73	35.9	6.06	36.0
Cd [mg/L]	22-Dec-22	10:32	0.000008	0.000013	0.000004	0.000004	< 0.000003	0.000364
Co [mg/L]	22-Dec-22	10:32	0.000137	0.000046	0.000094	0.000202	0.000054	0.00102
Cr [mg/L]	22-Dec-22	10:32	< 0.00008	0.00011	0.00009	0.00008	0.00008	0.00026
Cu [mg/L]	22-Dec-22	10:32	0.0031	0.0008	0.0011	0.0017	0.0009	0.0099
Fe [mg/L]	22-Dec-22	10:32	< 0.007	0.012	< 0.007	< 0.007	< 0.007	0.008
K [mg/L]	22-Dec-22	10:32	2.30	2.68	1.28	2.26	0.833	0.660
Li [mg/L]	22-Dec-22	10:32	0.0012	0.0002	0.0002	0.0006	0.0001	0.0003
Mg [mg/L]	22-Dec-22	10:32	1.68	0.609	0.576	2.20	0.452	3.52
Mn [mg/L]	22-Dec-22	10:32	0.0602	0.0136	0.0272	0.0609	0.0277	0.584
Mo [mg/L]	22-Dec-22	10:32	0.00535	0.03037	0.00186	0.00298	0.00133	0.00166
Na [mg/L]	22-Dec-22	10:32	10.3	2.64	4.02	7.34	3.17	1.27
Ni [mg/L]	22-Dec-22	10:32	0.0020	0.0004	0.0007	0.0011	0.0006	0.0027
Pb [mg/L]	22-Dec-22	10:32	< 0.00009	< 0.00009	< 0.00009	0.00012	< 0.00009	0.00014
Sb [mg/L]	22-Dec-22	10:32	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0010
Se [mg/L]	22-Dec-22	10:32	0.00064	< 0.00004	0.00016	0.00049	0.00008	0.00220
Sr [mg/L]	22-Dec-22	10:32	0.0145	0.0487	0.0257	0.0698	0.0224	0.0621
Sn [mg/L]	22-Dec-22	10:32	0.00806	0.00444	0.0108	0.00088	0.00345	0.00481

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10092-DEC22**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#0	6: B SED-High SFE Wk#0	7: B QTP-PAG Wk#0	8: B LGO-PAG Wk#0	9: B HGO-PAG-ZnB Wk#0	10: OB-ML Wk#0
Ti [mg/L]	22-Dec-22	10:32	0.00015	0.00041	0.00006	0.00005	0.00014	0.00030
Tl [mg/L]	22-Dec-22	10:32	0.000007	0.000009	< 0.000005	0.000006	0.000022	0.000013
U [mg/L]	22-Dec-22	10:32	0.00467	0.000313	0.000133	0.0178	0.00238	0.00204
V [mg/L]	22-Dec-22	10:32	0.00012	0.00059	0.00007	0.00005	0.00010	0.00135
W [mg/L]	22-Dec-22	10:32	0.00121	0.00032	0.00018	0.00027	0.00051	0.00042
Y [mg/L]	22-Dec-22	10:32	0.00015	0.00025	0.00004	0.00012	0.00006	0.00029
Zn [mg/L]	22-Dec-22	10:32	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.010

<original signed by>

Lisa Thompson
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Environment, Health & Safety

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Marathon - Berry Set 1

Project : Berry Project

10-January-2023

Date Rec. : 05 January 2023
LR Report: **CA10041-JAN23**
Reference: Wk#3

Copy: #1

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
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Phone: 709-730-5046
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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#3	6: B SED-High SFE Wk#3	7: B QTP-PAG Wk#3	8: B LGO-PAG Wk#3	9: B HGO-PAG-Zn Wk#3	10: B OB-ML Wk#3
Sample Date & Time			5-Jan-23	5-Jan-23	5-Jan-23	5-Jan-23	5-Jan-23	5-Jan-23
HumCell Leachate Vol [mL]	06-Jan-23	14:57	619	721	690	673	733	499
pH [No unit]	06-Jan-23	10:58	7.55	7.69	7.55	7.48	7.62	7.12
Conductivity [uS/cm]	06-Jan-23	10:58	62	59	66	129	55	141

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Project Specialist Assistant,
Environment, Health & Safety

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Marathon - Berry Set 1

Project : Berry Project

10-January-2023

Date Rec. : 22 December 2022
LR Report: **CA10136-DEC22**
Reference: Wk#1 - Berry Project

Copy: #1

Marathon Gold Corp
Attn : James Powell

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#1	6: B SED-High SFE Wk#1	7: B QTP-PAG Wk#1	8: B LGO-PAG Wk#1	9: B HGO-PAG-ZnB Wk#1	10: OB-ML Wk#1
Sample Date & Time			22-Dec-22	22-Dec-22	22-Dec-22	22-Dec-22	22-Dec-22	22-Dec-22
HumCell Leachate Vol [mL]	29-Dec-22	09:15	521	700	677	606	702	463
pH [No unit]	23-Dec-22	11:02	8.36	8.33	7.85	7.82	7.58	6.97
Acidity [mg/L as CaCO3]	23-Dec-22	11:02	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	23-Dec-22	11:02	14	26	23	14	17	6
Conductivity [uS/cm]	23-Dec-22	11:02	101	77	122	179	79	180
SO4 [mg/L]	06-Jan-23	14:50	29	8.8	31	66	16	84
F [mg/L]	23-Dec-22	08:24	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	29-Dec-22	13:44	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	30-Dec-22	11:17	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	30-Dec-22	11:17	0.085	0.086	0.033	0.062	0.039	0.048
As [mg/L]	30-Dec-22	11:17	0.0029	0.0004	0.0005	< 0.0002	0.0003	0.0025
Ba [mg/L]	30-Dec-22	11:17	0.00110	0.00350	0.00287	0.00155	0.00141	0.0112
Be [mg/L]	30-Dec-22	11:17	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	30-Dec-22	11:17	0.012	0.017	0.024	0.009	0.017	0.006
Bi [mg/L]	30-Dec-22	11:17	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00003	< 0.00001
Ca [mg/L]	30-Dec-22	11:17	11.9	8.35	16.2	28.2	9.88	33.9
Cd [mg/L]	30-Dec-22	11:17	0.000011	0.000046	0.000010	< 0.000003	0.000004	0.000091
Co [mg/L]	30-Dec-22	11:17	0.000045	0.000050	0.000092	0.000092	0.000036	0.000189
Cr [mg/L]	30-Dec-22	11:17	0.00038	0.00016	0.00021	0.00015	0.00024	0.00011
Cu [mg/L]	30-Dec-22	11:17	0.0021	0.0005	0.0008	0.0008	0.0004	0.0037
Fe [mg/L]	30-Dec-22	11:17	0.008	0.008	< 0.007	< 0.007	< 0.007	0.022
K [mg/L]	30-Dec-22	11:17	1.54	3.59	2.07	1.54	1.32	0.405
Li [mg/L]	30-Dec-22	11:17	0.0004	0.0004	0.0004	0.0004	0.0003	0.0001
Mg [mg/L]	30-Dec-22	11:17	1.46	1.37	1.42	1.86	0.986	2.12
Mn [mg/L]	30-Dec-22	11:17	0.0420	0.0255	0.0640	0.0403	0.0467	0.122
Mo [mg/L]	30-Dec-22	11:17	0.00831	0.112	0.00656	0.00329	0.00309	0.00216
Na [mg/L]	30-Dec-22	11:17	7.15	5.40	7.16	4.75	5.69	0.53
Ni [mg/L]	30-Dec-22	11:17	0.0010	0.0007	0.0023	0.0008	0.0005	0.0007
Pb [mg/L]	30-Dec-22	11:17	< 0.00009	0.00010	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	30-Dec-22	11:17	< 0.0009	< 0.0009	0.0011	< 0.0009	0.0009	0.0009
Se [mg/L]	30-Dec-22	11:17	0.00045	0.00006	0.00018	0.00042	0.00013	0.00159
Sr [mg/L]	30-Dec-22	11:17	0.0118	0.0951	0.0550	0.0558	0.0431	0.0471
Sn [mg/L]	30-Dec-22	11:17	0.00230	0.00193	0.00365	0.00054	0.00140	0.00150

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Marathon - Berry Set 2

Project : Berry Project

16-January-2023

Date Rec. : 12 January 2023
LR Report: **CA10087-JAN23**
Reference: Wk#3 - Berry Project

Copy: #1

Marathon Gold Corp
Attn : James Powell

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Phone: 709-730-5046
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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#3	6: B SED Wk#3	7: B MD Wk#3	8: B QTP Wk#3	9: B LGO Wk#3
Sample Date & Time			12-Jan-23	12-Jan-23	12-Jan-23	12-Jan-23	12-Jan-23
HumCell Leachate Vol [mL]	13-Jan-23	10:08	856	913	868	889	902
pH [No unit]	13-Jan-23	14:24	7.30	7.67	7.61	7.54	7.23
Conductivity [uS/cm]	13-Jan-23	14:24	31	42	42	31	30

Analysis	10: B HGO Wk#3
Sample Date & Time	12-Jan-23
HumCell Leachate Vol [mL]	867
pH [No unit]	7.30
Conductivity [uS/cm]	36

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10136-DEC22**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#1	6: B SED-High SFE Wk#1	7: B QTP-PAG Wk#1	8: B LGO-PAG Wk#1	9: B HGO-PAG-ZnB Wk#1	10: OB-ML Wk#1
Ti [mg/L]	30-Dec-22	11:17	0.00015	0.00032	0.00017	0.00007	0.00011	0.00085
Tl [mg/L]	30-Dec-22	11:17	< 0.000005	0.000018	< 0.000005	< 0.000005	0.000013	< 0.000005
U [mg/L]	30-Dec-22	11:17	0.00201	0.0177	0.000684	0.0135	0.00379	0.000851
V [mg/L]	30-Dec-22	11:17	0.00006	0.00065	0.00007	0.00006	0.00014	0.00166
W [mg/L]	30-Dec-22	11:17	0.00039	0.00063	0.00034	0.00026	0.00133	0.00025
Y [mg/L]	30-Dec-22	11:17	0.00006	0.00020	0.00005	0.00005	0.00005	0.00007
Zn [mg/L]	30-Dec-22	11:17	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

18-January-2023

Marathon Gold Corp
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Phone: 709-730-5046
Fax:

Date Rec. : 22 December 2022
LR Report: **CA10137-DEC22**
Reference: Wk#0 - Berry Project

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#	6: B SED Wk#0	7: B MD Wk#0	8: B QTP Wk#0	9: B LGO Wk#0	10: B HGO Wk#0
Sample Date & Time			22-Dec-22	22-Dec-22	22-Dec-22	22-Dec-22	22-Dec-22	22-Dec-22
HumCell Leachate Vol [mL]	29-Dec-22	09:15	834	860	826	831	844	832
pH [No unit]	23-Dec-22	10:19	8.01	8.78	8.32	8.76	8.06	8.64
Acidity [mg/L as CaCO3]	28-Dec-22	10:32	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	23-Dec-22	10:19	21	31	25	28	23	25
Conductivity [uS/cm]	23-Dec-22	10:19	52	59	61	60	66	62
SO4 [mg/L]	18-Jan-23	12:42	2.3	1.9	3.3	3.8	6.4	5.2
F [mg/L]	23-Dec-22	08:24	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	29-Dec-22	13:44	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	30-Dec-22	11:18	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	30-Dec-22	11:18	0.212	0.334	0.200	0.275	0.165	0.200
As [mg/L]	30-Dec-22	11:18	0.0021	0.0008	0.0004	0.0006	0.0030	0.0005
Ba [mg/L]	30-Dec-22	11:18	0.00071	0.00573	0.00154	0.00044	0.00056	0.00049
Be [mg/L]	30-Dec-22	11:18	0.000014	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	30-Dec-22	11:18	0.003	0.006	0.005	0.017	0.011	0.009
Bi [mg/L]	30-Dec-22	11:18	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	30-Dec-22	11:18	5.52	5.16	7.36	5.67	6.78	6.04
Cd [mg/L]	30-Dec-22	11:18	0.000005	0.000004	< 0.000003	< 0.000003	0.000003	0.000005
Co [mg/L]	30-Dec-22	11:18	0.000024	0.000027	0.000014	0.000030	0.000028	0.000059
Cr [mg/L]	30-Dec-22	11:18	0.00013	0.00016	< 0.00008	0.00034	0.00047	0.00031
Cu [mg/L]	30-Dec-22	11:18	0.0015	0.0020	0.0018	0.0028	0.0015	0.0033
Fe [mg/L]	30-Dec-22	11:18	< 0.007	0.010	< 0.007	0.016	0.011	0.009
K [mg/L]	30-Dec-22	11:18	1.42	2.02	1.52	1.74	1.46	1.16
Li [mg/L]	30-Dec-22	11:18	0.0006	0.0004	0.0002	0.0004	0.0004	0.0005
Mg [mg/L]	30-Dec-22	11:18	0.266	0.504	0.807	0.365	0.371	0.306
Mn [mg/L]	30-Dec-22	11:18	0.00970	0.00543	0.00430	0.0121	0.0160	0.0140
Mo [mg/L]	30-Dec-22	11:18	0.00124	0.00082	0.00132	0.00427	0.00233	0.00066
Na [mg/L]	30-Dec-22	11:18	4.03	4.61	2.90	4.80	4.25	4.55
Ni [mg/L]	30-Dec-22	11:18	0.0002	0.0003	0.0002	0.0005	0.0003	0.0006
Pb [mg/L]	30-Dec-22	11:18	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	30-Dec-22	11:18	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	30-Dec-22	11:18	0.00009	< 0.00004	0.00006	0.00007	0.00011	0.00011
Sr [mg/L]	30-Dec-22	11:18	0.00727	0.0403	0.0262	0.0169	0.0145	0.0140
Sn [mg/L]	30-Dec-22	11:18	0.00056	0.00828	0.00070	0.00026	0.00280	0.00092

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Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10137-DEC22**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#	6: B SED Wk#0	7: B MD Wk#0	8: B QTP Wk#0	9: B LGO Wk#0	10: B HGO Wk#0
Ti [mg/L]	30-Dec-22	11:18	0.00027	0.00038	0.00008	0.00084	0.00022	0.00027
Tl [mg/L]	30-Dec-22	11:18	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	30-Dec-22	11:18	0.00167	0.000464	0.000289	0.000497	0.00183	0.00223
V [mg/L]	30-Dec-22	11:18	0.00031	0.00081	0.00271	0.00060	0.00023	0.00032
W [mg/L]	30-Dec-22	11:18	0.00046	0.00044	0.00027	0.00054	0.00038	0.00031
Y [mg/L]	30-Dec-22	11:18	0.00003	< 0.00002	< 0.00002	0.00010	0.00005	0.00005
Zn [mg/L]	30-Dec-22	11:18	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

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Marathon - Berry Set 1

Project : Berry Project

18-January-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 29 December 2022
LR Report: **CA10253-DEC22**
Reference: Wk#2 - Berry Project

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#2	6: B SED-High SFE Wk#2	7: B QTP-PAG Wk#2	8: B LGO-PAG Wk#2	9: B HGO-PAG-ZnB Wk#2	10: OB-ML Wk#2
Sample Date & Time			29-Dec-22	29-Dec-22	29-Dec-22	29-Dec-22	29-Dec-22	29-Dec-22
HumCell Leachate Vol [mL]	03-Jan-23	09:49	574	698	669	642	700	481
pH [No unit]	03-Jan-23	11:19	7.38	7.74	7.75	7.47	7.55	7.03
Acidity [mg/L as CaCO3]	04-Jan-23	10:30	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	03-Jan-23	11:19	16	23	22	10	20	7
Conductivity [uS/cm]	03-Jan-23	11:19	79	71	90	116	66	207
SO4 [mg/L]	18-Jan-23	12:43	15	6.1	16	32	9.7	78
F [mg/L]	03-Jan-23	13:14	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	03-Jan-23	15:54	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	05-Jan-23	12:31	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	05-Jan-23	12:31	0.036	0.060	0.025	0.033	0.029	0.043
As [mg/L]	05-Jan-23	12:31	0.0005	0.0004	0.0005	< 0.0002	0.0007	0.0018
Ba [mg/L]	05-Jan-23	12:31	0.00071	0.00333	0.00231	0.00090	0.00143	0.0119
Be [mg/L]	05-Jan-23	12:31	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	05-Jan-23	12:31	0.019	0.013	0.016	0.007	0.010	0.004
Bi [mg/L]	05-Jan-23	12:31	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	< 0.00001
Ca [mg/L]	05-Jan-23	12:31	9.73	7.04	11.7	16.5	8.99	34.7
Cd [mg/L]	05-Jan-23	12:31	0.000008	0.000019	0.000003	0.000013	0.000009	0.000048
Co [mg/L]	05-Jan-23	12:31	0.000028	0.000038	0.000068	0.000039	0.000027	0.000142
Cr [mg/L]	05-Jan-23	12:31	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	05-Jan-23	12:31	0.0009	0.0003	0.0004	0.0004	0.0004	0.0029
Fe [mg/L]	05-Jan-23	12:31	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	0.031
K [mg/L]	05-Jan-23	12:31	0.981	2.78	1.27	0.822	0.875	0.452
Li [mg/L]	05-Jan-23	12:31	0.0002	0.0002	0.0002	0.0002	0.0001	< 0.0001
Mg [mg/L]	05-Jan-23	12:31	0.934	0.964	0.790	0.963	0.645	1.33
Mn [mg/L]	05-Jan-23	12:31	0.0822	0.0288	0.0559	0.0393	0.0579	0.0795
Mo [mg/L]	05-Jan-23	12:31	0.00675	0.0766	0.00487	0.00216	0.00155	0.00296
Na [mg/L]	05-Jan-23	12:31	2.37	3.13	3.03	1.86	2.59	0.30
Ni [mg/L]	05-Jan-23	12:31	0.0003	0.0002	0.0008	0.0003	0.0005	0.0003
Pb [mg/L]	05-Jan-23	12:31	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	05-Jan-23	12:31	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0009
Se [mg/L]	05-Jan-23	12:31	0.00032	0.00015	0.00020	0.00017	0.00014	0.00185
Sr [mg/L]	05-Jan-23	12:31	0.00901	0.0787	0.0365	0.0295	0.0332	0.0486
Sn [mg/L]	05-Jan-23	12:31	0.00138	0.00067	0.00130	0.00012	0.00043	0.00041

OnLine LIMS

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10253-DEC22**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#2	6: B SED-High SFE Wk#2	7: B QTP-PAG Wk#2	8: B LGO-PAG Wk#2	9: B HGO-PAG-ZnB Wk#2	10: OB-ML Wk#2
Ti [mg/L]	05-Jan-23	12:31	0.00014	0.00018	0.00012	0.00024	0.00022	0.00136
Tl [mg/L]	05-Jan-23	12:31	< 0.000005	0.000008	< 0.000005	< 0.000005	< 0.000005	0.000007
U [mg/L]	05-Jan-23	12:31	0.000718	0.0135	0.000744	0.00257	0.000887	0.00124
V [mg/L]	05-Jan-23	12:31	0.00003	0.00057	0.00007	0.00004	0.00009	0.00143
W [mg/L]	05-Jan-23	12:31	0.00028	0.00050	0.00027	0.00022	0.00096	0.00023
Y [mg/L]	05-Jan-23	12:31	0.00005	0.00014	0.00005	0.00002	0.00003	0.00007
Zn [mg/L]	05-Jan-23	12:31	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

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Project Specialist Assistant,
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Marathon - Berry Set 2

Project : Berry Project

18-January-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 29 December 2022
LR Report: **CA10254-DEC22**
Reference: Wk#1 - Berry Project

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#	6: B SED Wk#1	7: B MD Wk#1	8: B QTP Wk#1	9: B LGO Wk#1	10: B HGO Wk#1
Sample Date & Time			29-Dec-22	29-Dec-22	29-Dec-22	29-Dec-22	29-Dec-22	29-Dec-22
HumCell Leachate Vol [mL]	03-Jan-23	09:49	845	889	917	882	927	890
pH [No unit]	03-Jan-23	11:20	7.75	8.77	8.20	8.00	7.73	7.93
Acidity [mg/L as CaCO3]	04-Jan-23	11:14	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	03-Jan-23	11:20	13	25	21	14	12	14
Conductivity [uS/cm]	03-Jan-23	11:20	62	55	62	58	74	88
SO4 [mg/L]	18-Jan-23	12:44	6.2	4.1	7.2	5.6	11	14
F [mg/L]	03-Jan-23	13:14	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	03-Jan-23	15:54	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	04-Jan-23	14:02	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	04-Jan-23	14:02	0.058	0.120	0.083	0.071	0.047	0.043
As [mg/L]	04-Jan-23	14:02	0.0010	0.0007	0.0003	0.0005	0.0003	0.0005
Ba [mg/L]	04-Jan-23	14:02	0.00072	0.00527	0.00151	0.00058	0.00087	0.00068
Be [mg/L]	04-Jan-23	14:02	0.000012	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	04-Jan-23	14:02	0.005	0.004	0.007	0.021	0.012	0.015
Bi [mg/L]	04-Jan-23	14:02	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	0.00001
Ca [mg/L]	04-Jan-23	14:02	4.09	4.34	6.96	4.39	5.17	8.07
Cd [mg/L]	04-Jan-23	14:02	0.000013	< 0.000003	0.000004	0.000003	0.000003	0.000009
Co [mg/L]	04-Jan-23	14:02	0.000014	0.000008	0.000016	0.000020	0.000031	0.000030
Cr [mg/L]	04-Jan-23	14:02	< 0.00008	< 0.00008	0.00012	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	04-Jan-23	14:02	0.0028	0.0014	0.0009	0.0050	0.0076	0.0026
Fe [mg/L]	04-Jan-23	14:02	< 0.007	< 0.007	0.007	0.013	0.009	0.011
K [mg/L]	04-Jan-23	14:02	1.36	1.49	1.15	1.44	1.28	1.19
Li [mg/L]	04-Jan-23	14:02	0.0003	0.0002	< 0.0001	0.0002	0.0002	0.0001
Mg [mg/L]	04-Jan-23	14:02	0.285	0.465	0.826	0.380	0.418	0.595
Mn [mg/L]	04-Jan-23	14:02	0.0199	0.0131	0.0112	0.0238	0.0276	0.0356
Mo [mg/L]	04-Jan-23	14:02	0.00458	0.00229	0.00301	0.00939	0.00180	0.00753
Na [mg/L]	04-Jan-23	14:02	6.30	4.66	2.71	5.16	7.29	6.32
Ni [mg/L]	04-Jan-23	14:02	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0002	0.0002
Pb [mg/L]	04-Jan-23	14:02	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	0.00010
Sb [mg/L]	04-Jan-23	14:02	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	04-Jan-23	14:02	0.00014	0.00008	0.00016	0.00017	0.00005	0.00008
Sr [mg/L]	04-Jan-23	14:02	0.00792	0.0442	0.0315	0.0175	0.0194	0.0279
Sn [mg/L]	04-Jan-23	14:02	0.00029	0.00097	0.00025	0.00017	0.00021	0.00043

OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10254-DEC22**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#	6: B SED Wk#1	7: B MD Wk#1	8: B QTP Wk#1	9: B LGO Wk#1	10: B HGO Wk#1
Ti [mg/L]	04-Jan-23	14:02	0.00024	0.00016	0.00027	0.00058	0.00036	0.00023
Tl [mg/L]	04-Jan-23	14:02	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	0.000005
U [mg/L]	04-Jan-23	14:02	0.000518	0.000954	0.00101	0.00455	0.000903	0.000496
V [mg/L]	04-Jan-23	14:02	0.00016	0.00058	0.00456	0.00026	0.00015	0.00010
W [mg/L]	04-Jan-23	14:02	0.00058	0.00053	0.00015	0.00072	0.00043	0.00032
Y [mg/L]	04-Jan-23	14:02	0.00006	0.00003	< 0.00002	0.00015	0.00013	0.00014
Zn [mg/L]	04-Jan-23	14:02	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

<original signed by>

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Project Specialist Assistant,
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Marathon - Berry Set 2

Project : Berry Project

18-January-2023

Date Rec. : 05 January 2023
LR Report: **CA10042-JAN23**
Reference: Wk#2

Copy: #1

Marathon Gold Corp
Attn : James Powell

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A1N 0A1, Canada

Phone: 709-730-5046
Fax:

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#2	6: B SED Wk#2	7: B MD Wk#2	8: B QTP Wk#2	9: B LGO Wk#2	10: B HGO Wk#2
Sample Date & Time			5-Jan-23	5-Jan-23	5-Jan-23	5-Jan-23	5-Jan-23	5-Jan-23
HumCell Leachate Vol [mL]	06-Jan-23	15:00	891	926	877	811	900	889
pH [No unit]	09-Jan-23	12:01	8.03	9.19	8.46	7.95	8.03	8.05
Acidity [mg/L as CaCO3]	09-Jan-23	12:01	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	09-Jan-23	12:01	14	23	17	14	12	14
Conductivity [uS/cm]	09-Jan-23	12:01	39	41	48	33	37	49
SO4 [mg/L]	16-Jan-23	15:38	2.2	2.0	4.0	2.0	3.5	6.0
F [mg/L]	06-Jan-23	13:23	0.12	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	06-Jan-23	15:31	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	10-Jan-23	14:18	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	10-Jan-23	14:18	0.065	0.131	0.080	0.065	0.050	0.042
As [mg/L]	10-Jan-23	14:18	0.0014	0.0037	0.0009	0.0008	0.0004	0.0003
Ba [mg/L]	10-Jan-23	14:18	0.00052	0.00656	0.00108	0.00046	0.00040	0.00030
Be [mg/L]	10-Jan-23	14:18	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	10-Jan-23	14:18	0.009	0.008	0.011	0.018	0.009	0.011
Bi [mg/L]	10-Jan-23	14:18	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001
Ca [mg/L]	10-Jan-23	14:18	3.44	4.01	5.20	3.58	3.44	4.75
Cd [mg/L]	10-Jan-23	14:18	0.000010	< 0.000003	< 0.000003	0.000005	< 0.000003	< 0.000003
Co [mg/L]	10-Jan-23	14:18	0.000027	0.000009	0.000011	0.000013	0.000025	0.000038
Cr [mg/L]	10-Jan-23	14:18	< 0.00008	< 0.00008	< 0.00008	0.00011	< 0.00008	< 0.00008
Cu [mg/L]	10-Jan-23	14:18	0.0014	0.0010	0.0008	0.0027	0.0031	0.0015
Fe [mg/L]	10-Jan-23	14:18	< 0.007	< 0.007	0.007	0.010	0.007	0.007
K [mg/L]	10-Jan-23	14:18	0.991	1.28	0.841	0.973	0.724	0.675
Li [mg/L]	10-Jan-23	14:18	0.0003	0.0002	0.0001	0.0002	0.0002	< 0.0001
Mg [mg/L]	10-Jan-23	14:18	0.207	0.405	0.569	0.263	0.237	0.347
Mn [mg/L]	10-Jan-23	14:18	0.0177	0.0131	0.0119	0.0234	0.0236	0.0295
Mo [mg/L]	10-Jan-23	14:18	0.00417	0.00147	0.00294	0.00493	0.00091	0.00414
Na [mg/L]	10-Jan-23	14:18	3.31	2.90	1.77	2.52	3.28	3.20
Ni [mg/L]	10-Jan-23	14:18	0.0002	0.0003	0.0003	0.0002	0.0002	0.0003
Pb [mg/L]	10-Jan-23	14:18	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	10-Jan-23	14:18	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	10-Jan-23	14:18	0.00012	0.00009	0.00014	0.00009	0.00012	0.00016
Sr [mg/L]	10-Jan-23	14:18	0.00499	0.0361	0.0206	0.0112	0.00919	0.0127
Sn [mg/L]	10-Jan-23	14:18	0.00012	0.00050	0.00011	0.00007	0.00011	0.00021

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10042-JAN23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#2	6: B SED Wk#2	7: B MD Wk#2	8: B QTP Wk#2	9: B LGO Wk#2	10: B HGO Wk#2
Ti [mg/L]	10-Jan-23	14:18	0.00017	0.00010	0.00021	0.00044	0.00034	0.00019
Tl [mg/L]	10-Jan-23	14:18	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	10-Jan-23	14:18	0.00647	0.00333	0.00125	0.000597	0.000783	0.000566
V [mg/L]	10-Jan-23	14:18	0.00023	0.00077	0.00559	0.00026	0.00016	0.00013
W [mg/L]	10-Jan-23	14:18	0.00045	0.00041	0.00016	0.00044	0.00030	0.00022
Y [mg/L]	10-Jan-23	14:18	0.00004	0.00002	< 0.00002	0.00011	0.00010	0.00007
Zn [mg/L]	10-Jan-23	14:18	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003198906

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
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Marathon - Berry Set 1

Project : Berry Project

23-January-2023

Date Rec. : 19 January 2023
LR Report: **CA10134-JAN23**
Reference: Wk#5 - Berry Project

Copy: #1

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#5	6: B SED-High SFE Wk#5	7: B QTP-PAG Wk#5	8: B LGO-PAG Wk#5	9: B HGO-PAG-Zn Wk#5	10: B OB-ML Wk#5
Sample Date & Time			18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23
HumCell Leachate Vol [mL]	20-Jan-23	15:07	604	709	681	625	703	532
pH [No unit]	20-Jan-23	10:06	7.14	7.84	7.13	7.10	7.05	6.75
Conductivity [uS/cm]	20-Jan-23	10:06	38	44	38	42	30	114

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003204076

TEST REPORT
Sub-Aqueous Column

Sample Properties

BL1021-43 Detox Tls (g)	3000
Process Water Cover (mL)	2390
Initital Tailings Height in Column (cn	27.6

Analysis of Column Leachate

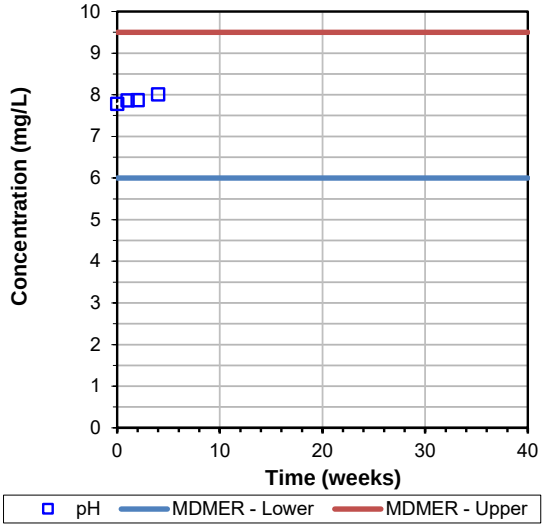
Parameter	Units	CCME FAL / MDMER	0	1	2	4	6
Date			25-Nov-22	01-Dec-22	08-Dec-22	22-Dec-22	05-Jan-23
LIMS			14520-NOV22	14059-DEC22	14281-DEC22	14616-DEC22	n/a
Volume Collected	mL	-	500	450	450	450	450
Temp Upon Receipt	°C	-	20.0	21.0	20.0	20.0	-
pH	no unit	6.0-9.5	7.78	7.86	7.87	8.01	-
Alkalinity	mg/L as $CaCO_3$	-	53	65	78	104	-
Conductivity	µS/cm	-	1840	1890	1870	1950	-
Redox Potential	mV	-	164	329	333	286	-
TDS	mg/L	-	1260	1160	1320	1310	-
F	mg/L	0.12	**0.14**	0.10	0.08	0.07	-
NO_2	as N mg/L	0.06	< 0.3	< 0.3	< 0.3	< 0.3	-
NO_3	as N mg/L	13	0.95	< 0.6	< 0.6	< 0.6	-
NO_2+NO_3	as N mg/L	-	0.95	< 0.6	< 0.06	< 0.6	-
Cl	mg/L	120	12	9.7	7.4	7.8	-
SO_4	mg/L	-	710	760	800	910	-
$CN_{(T)}$	mg/L	0.50	**0.79**	**1.90**	**2.66**	**2.74**	-
CN_{WAD}	mg/L	0.005 as CNF	**0.774**	**1.51**	**2.25**	**2.29**	-
CNS	mg/L	-	< 2	5.7	5.6	4.0	-
CNO	mg/L	-	62	14 UAL	1.5	< 1	-
NH_3+NH_4	as N mg/L	-	3.6	5.8	7.3	7.2	-
Un-ionized NH_3 (calc'd)	as N mg/L	0.02 / 0.50	**0.08**	**0.16**	**0.21**	**0.28**	-
S_2O_3	as S_2O_3 mg/L	-	< 20	< 20	< 20	< 20	-
Hg	mg/L	).000026 / 0.000	**0.00004**	**0.00024**	**0.00003**	< 0.00001	-
Ag	mg/L	0.00025	**0.00029**	**0.00234**	**0.00083**	**0.00031**	-
Al	mg/L	0.1@pH>6.5	0.035	0.029	0.021	0.018	-
As	mg/L	0.005 / 0.10	0.0003	0.0005	0.0004	0.0006	-
B	mg/L	1.5	0.039	0.042	0.097	0.053	-
Ba	mg/L	-	0.00789	0.00932	0.01056	0.00914	-
Be	mg/L		< 0.000007	< 0.000007	< 0.000007	< 0.000007	-
Bi	mg/L	-	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-
Ca	mg/L	-	100	95.5	87.6	102	-
Cd	mg/L	0.00009	0.000021	0.000024	0.000022	0.000032	-
Co	mg/L	-	0.00479	0.00247	0.00389	0.0102	-
Cr	mg/L	-	0.00011	< 0.00008	0.00016	< 0.00008	-
Cu	mg/L	0.002 / 0.10	**0.743**	**1.63**	**2.70**	**2.45**	-
Fe	mg/L	0.3	0.030	< 0.007	< 0.007	0.036	-
K	mg/L	-	7.09	11.9	10.2	10.7	-
Li	mg/L	-	0.0037	0.0038	0.0018	0.0012	-
Mg	mg/L	-	4.81	7.20	6.73	8.10	-
Mn	mg/L	-	0.103	0.0543	0.0848	0.0959	-
Mo	mg/L	0.073	0.0163	0.0342	0.0377	0.0382	-
Na	mg/L	-	256	299	287	316	-
Ni	mg/L	0.025 / 0.25	0.0123	0.0012	0.0019	0.0041	-
P	mg/L	-	0.013	0.007	0.006	0.004	-
Pb	mg/L	0.001 / 0.08	**0.00103**	< 0.00009	< 0.00009	< 0.00009	-
S	mg/L	-	292	302	293	312	-
Sb	mg/L	-	0.0013	0.0012	0.0013	0.0013	-
Se	mg/L	0.001 / 0.01	**0.00131**	0.00060	0.00036	0.00029	-
Si	mg/L	-	1.25	2.36	2.23	2.45	-
Sn	mg/L	-	0.00389	0.00023	0.00025	0.00016	-
Sr	mg/L	-	0.351	0.361	0.347	0.367	-
Th	mg/L	-	< 0.0001	< 0.0001	0.0008	< 0.0001	-
Ti	mg/L	-	< 0.00005	< 0.00005	< 0.00005	0.00010	-
Tl	mg/L	0.0008	< 0.000005	0.000007	0.000019	0.000008	-
U	mg/L	0.015	0.000524	0.000253	0.000379	0.000868	-
V	mg/L	-	0.00002	0.00003	0.00004	0.00003	-
W	mg/L	-	0.00009	0.00010	0.00010	0.00006	-
Y	mg/L	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	-
Zn	mg/L	0.007 / 0.40	< 0.002	**0.009**	**0.015**	**0.011**	-

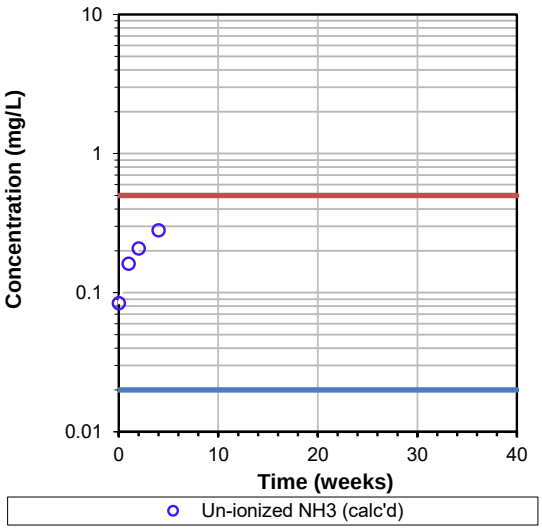
Parameters outside the CCME FAL guidelines are indicated in bold type.
Parameters outside the MDMER limits are indicated in bold blue type.

Raised RL's for CNS, Nitrates + $S2O_3$ due to sample matrix
UAL=CNO process past holding time

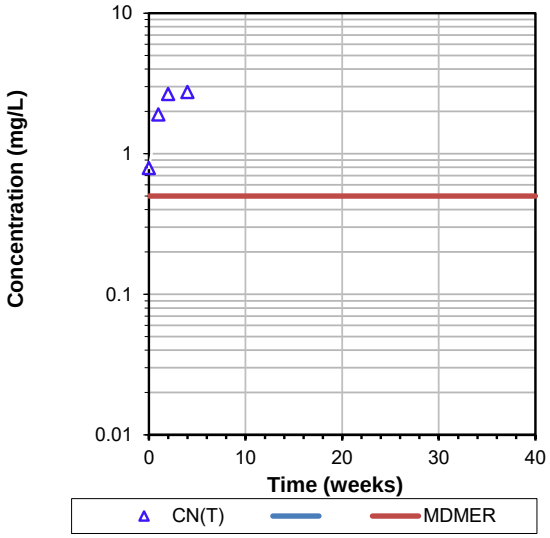
TEST REPORT
Sub-Aqueous Column

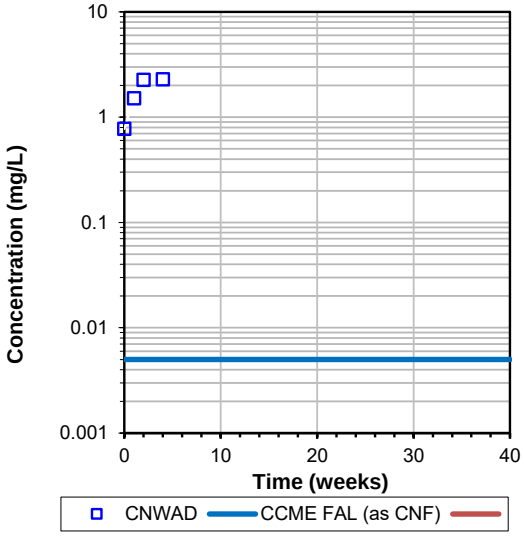
Selected Parameters - BL1021-43 Detox Tls (g)





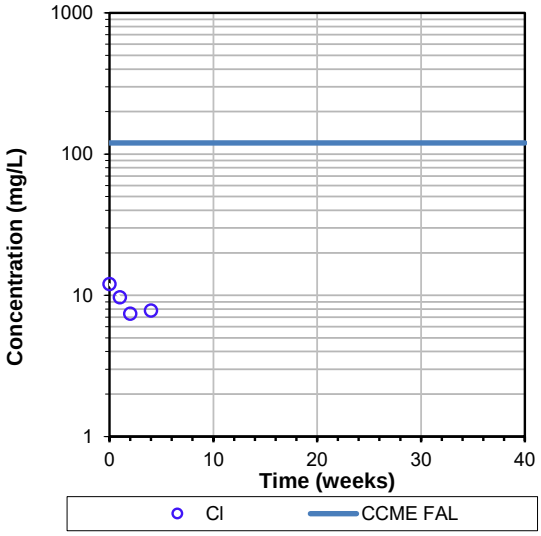
Selected Parameters - BL1021-43 Detox Tls (g)

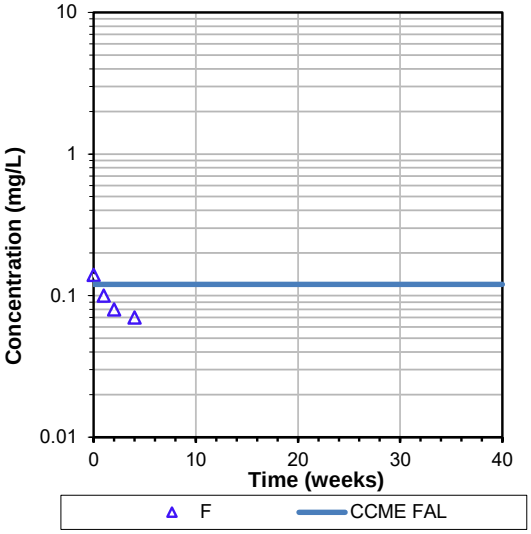




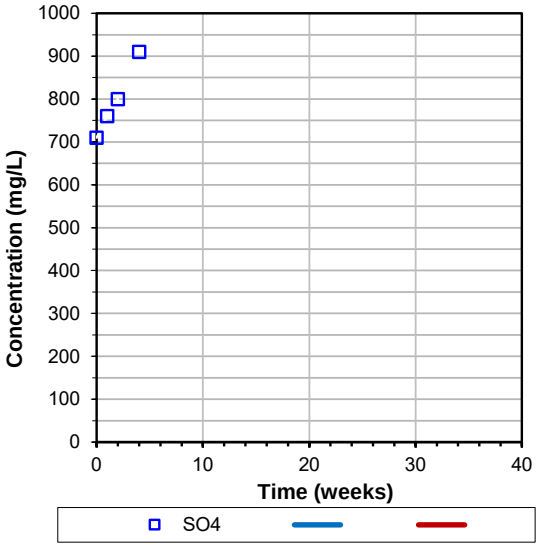
TEST REPORT
Sub-Aqueous Column

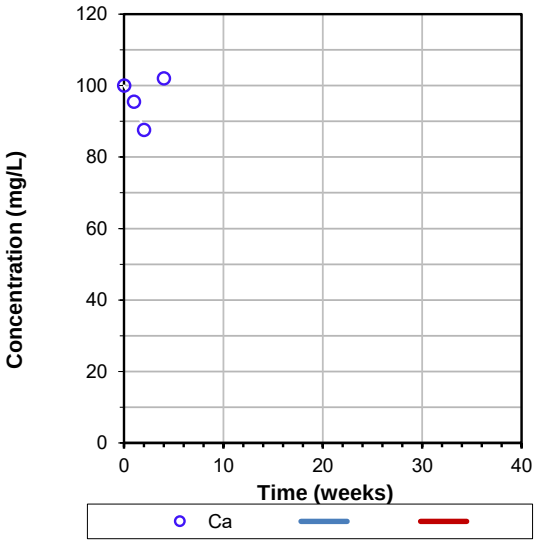
Selected Parameters - BL1021-43 Detox Tls (g)





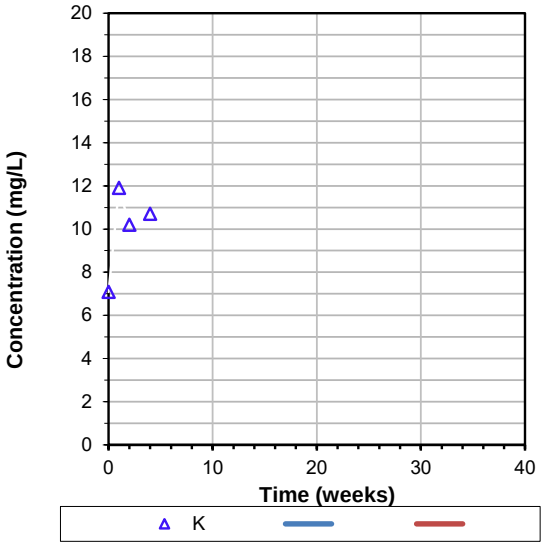
Selected Parameters - BL1021-43 Detox Tls (g)

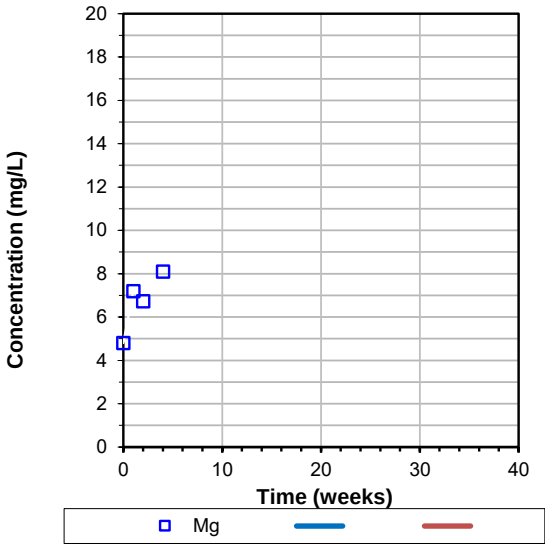




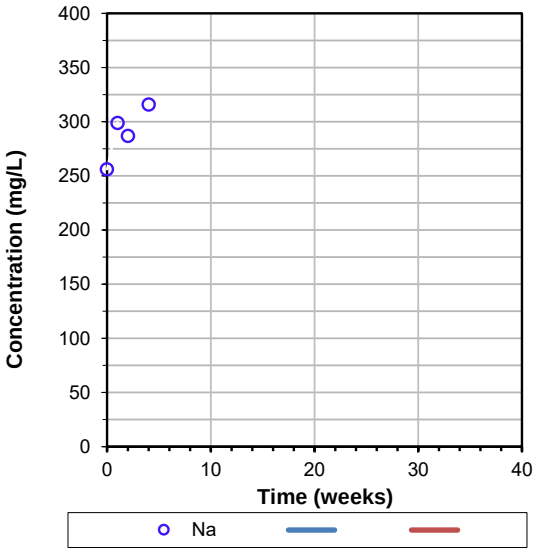
TEST REPORT
Sub-Aqueous Column

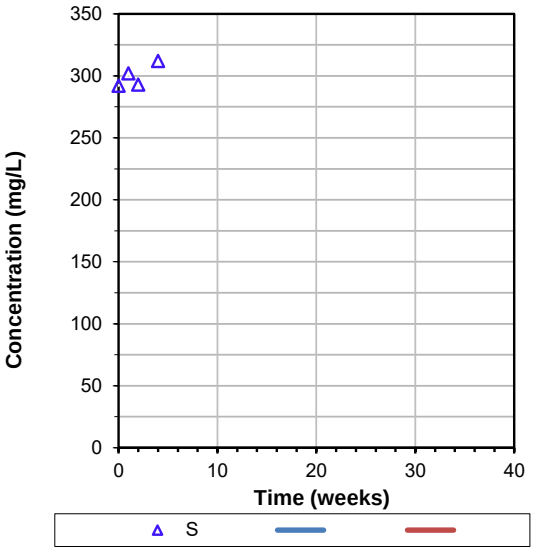
Selected Parameters - BL1021-43 Detox Tls (g)





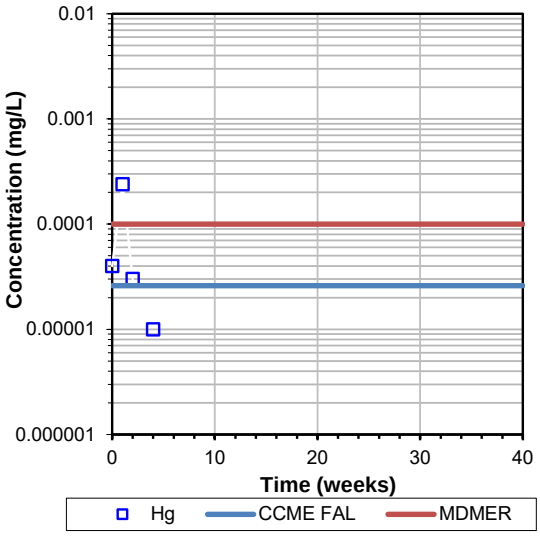
Selected Parameters - BL1021-43 Detox Tls (g)

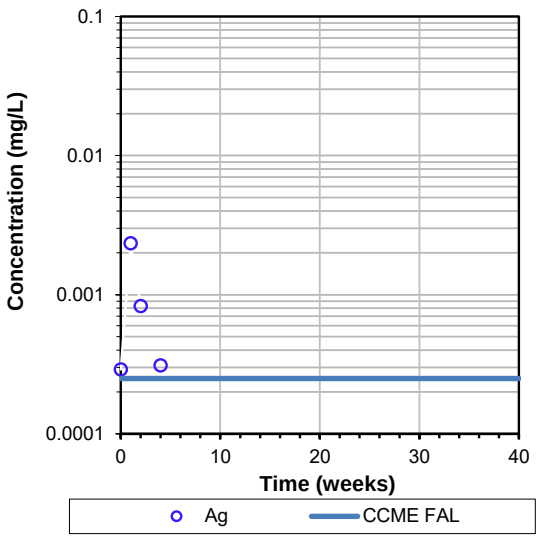




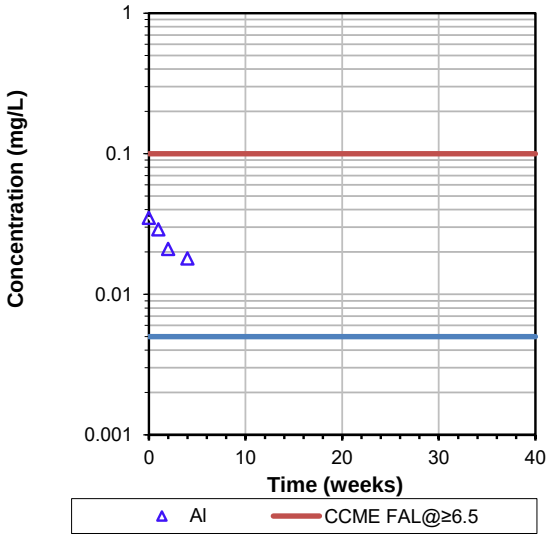
TEST REPORT
Sub-Aqueous Column

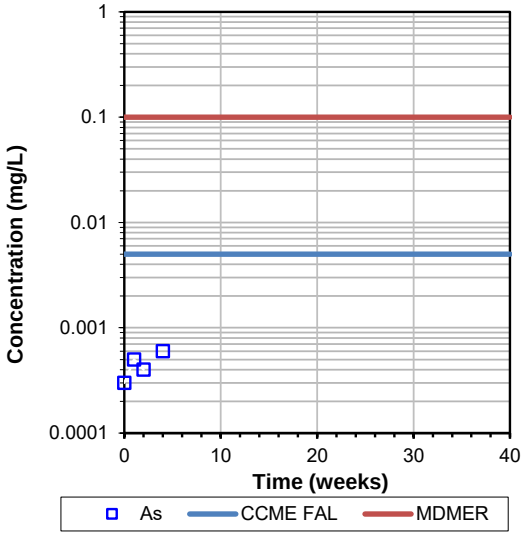
Selected Parameters - BL1021-43 Detox Tls (g)





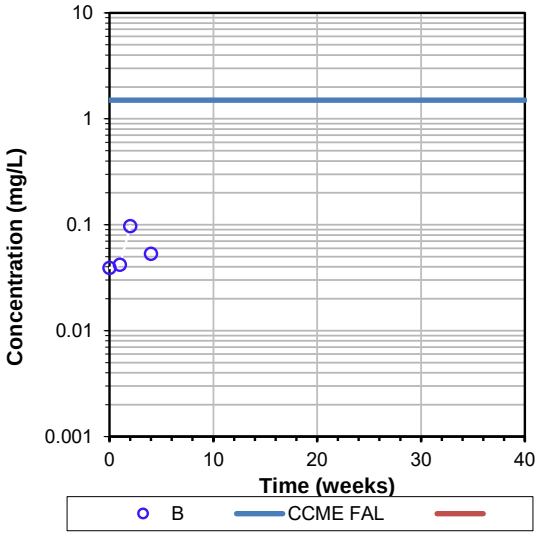
Selected Parameters - BL1021-43 Detox Tls (g)

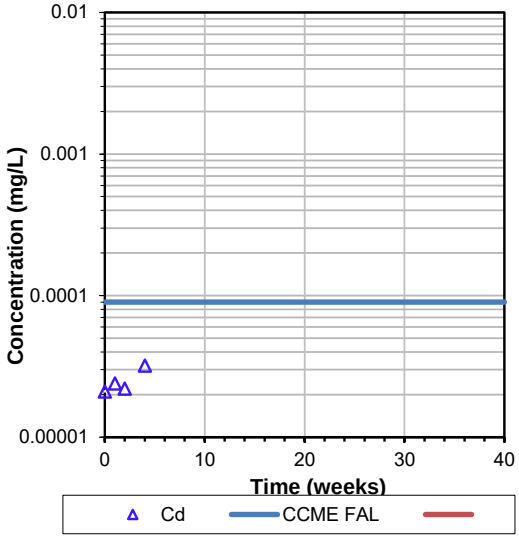




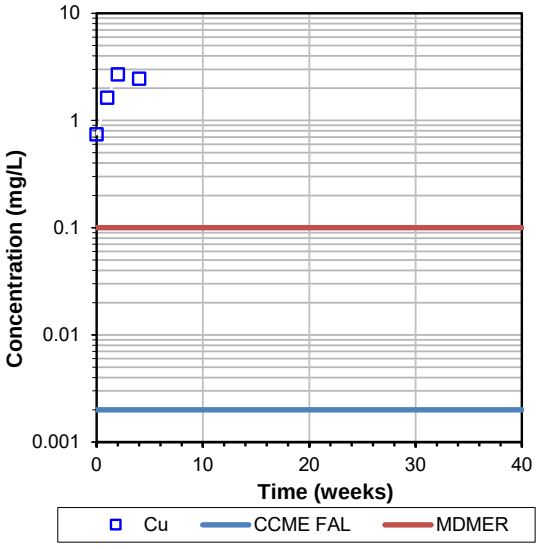
TEST REPORT
Sub-Aqueous Column

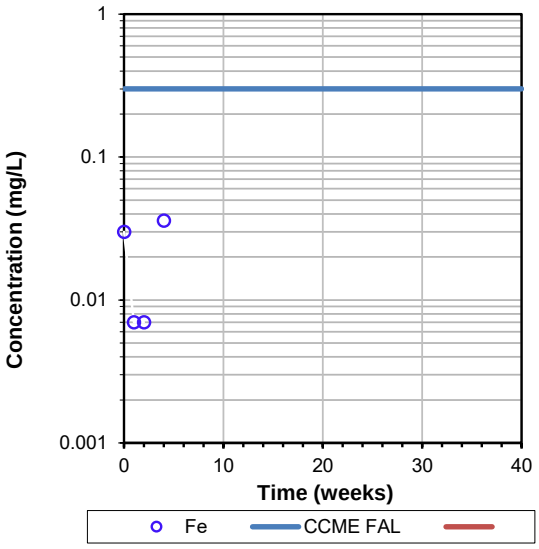
Selected Parameters - BL1021-43 Detox Tls (g)





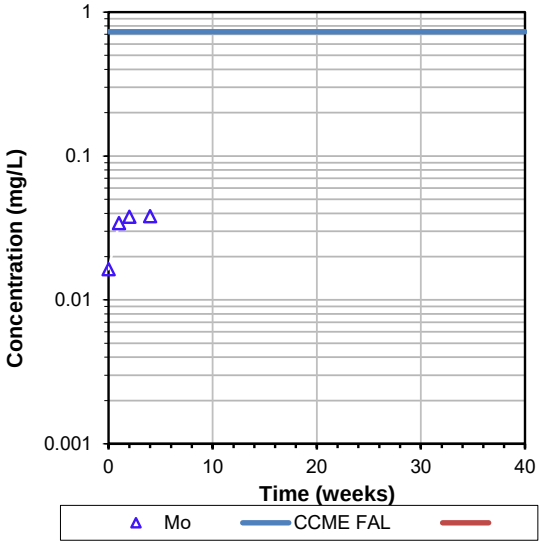
Selected Parameters - BL1021-43 Detox Tls (g)

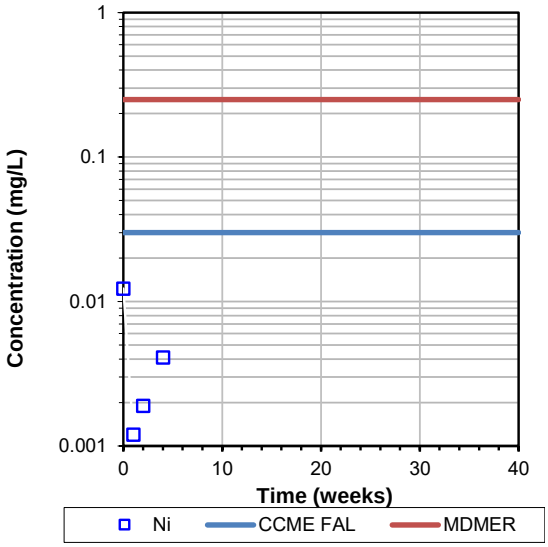




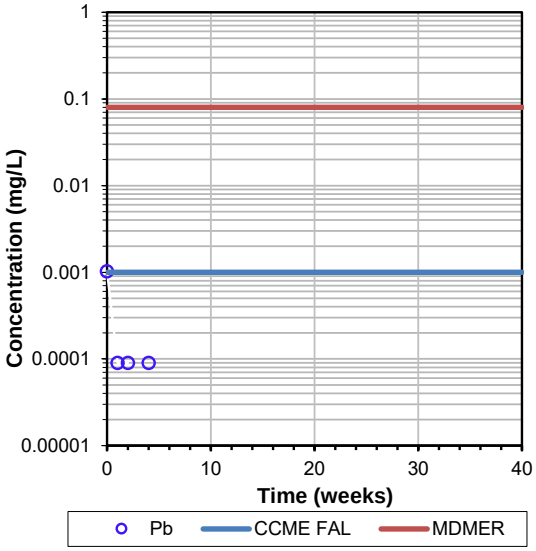
TEST REPORT
Sub-Aqueous Column

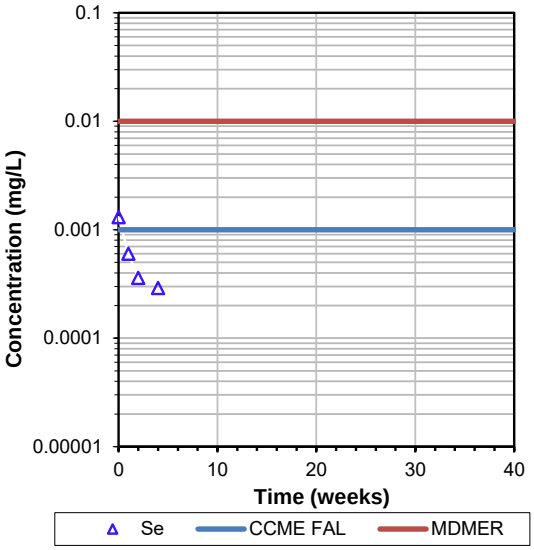
Selected Parameters - BL1021-43 Detox Tls (g)





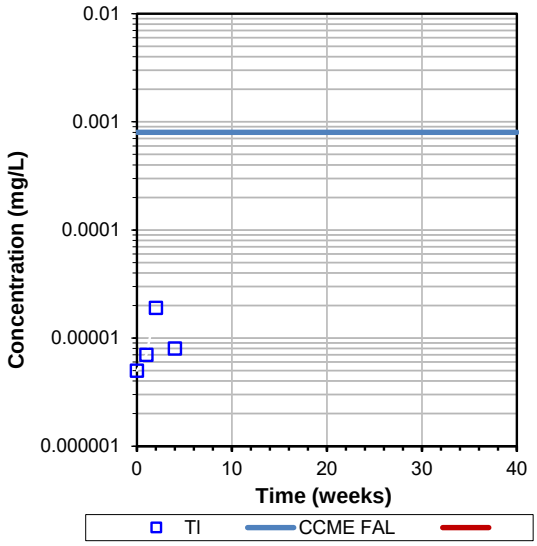
Selected Parameters - BL1021-43 Detox Tls (g)

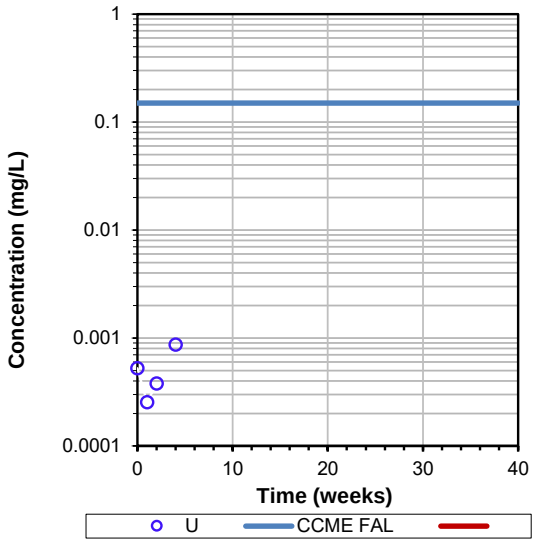




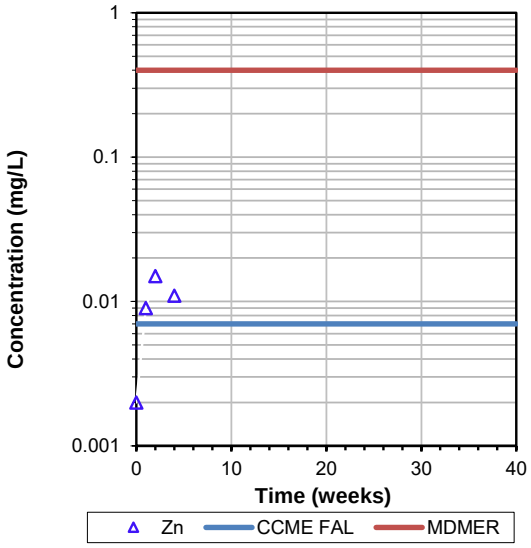
TEST REPORT
Sub-Aqueous Column

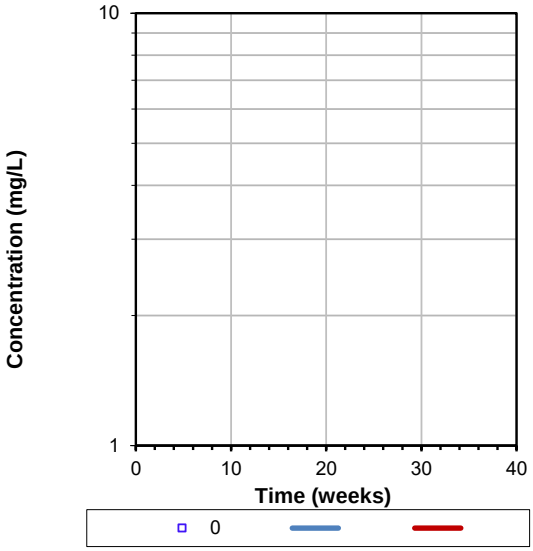
Selected Parameters - BL1021-43 Detox Tls (g)





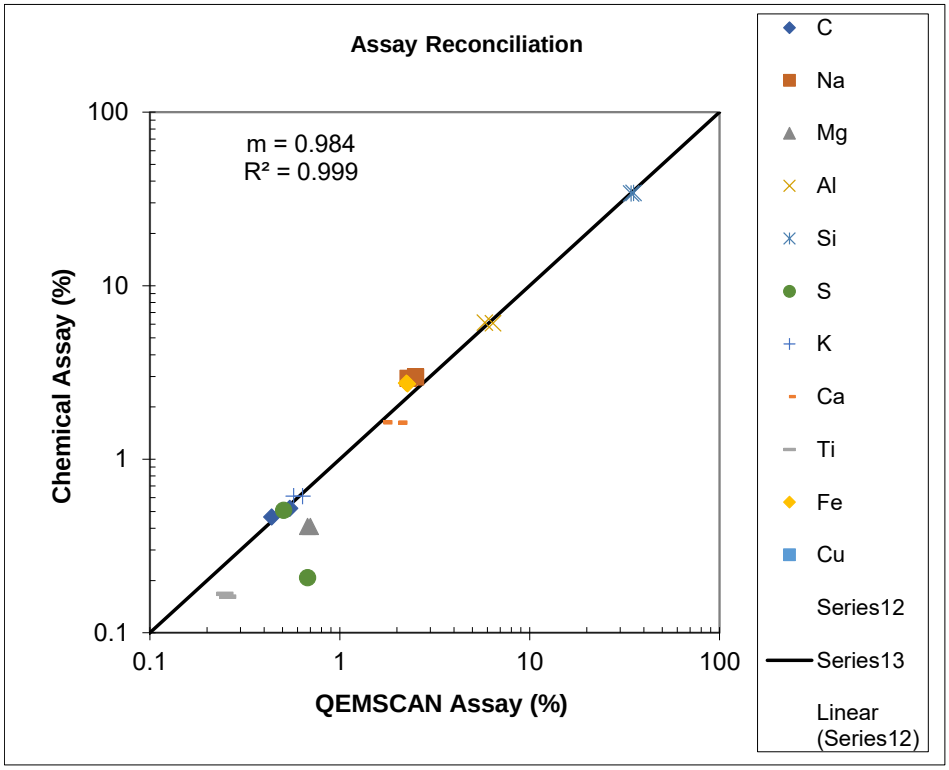
Selected Parameters - BL1021-43 Detox Tls (g)





Marathon Gold
16863-02
MI5051-NOV22

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)



Sample/Element	BL1021-24D Detox Tls	BL1021-43 Detox Tls
C (QEMSCAN)*	0.44	0.55
C (Chemical)	0.47	0.52
Na (QEMSCAN)	2.51	2.29
Na (Chemical)	2.98	2.93
Mg (QEMSCAN)	0.70	0.68
Mg (Chemical)	0.41	0.41
Al (QEMSCAN)	5.82	6.40
Al (Chemical)	6.14	6.09
Si (QEMSCAN)	35.3	34.2
Si (Chemical)	34.3	34.0
S (QEMSCAN)	0.51	0.68
S (Chemical)	0.51	0.21
K (QEMSCAN)	0.57	0.64
K (Chemical)	0.61	0.61
Ca (QEMSCAN)	1.70	2.05
Ca (Chemical)	1.64	1.63
Ti (QEMSCAN)	0.26	0.25
Ti (Chemical)	0.16	0.17
Fe (QEMSCAN)	2.25	2.27
Fe (Chemical)	2.75	2.72
Cu (QEMSCAN)	0.00	0.00
Cu (Chemical)	0.01	0.02

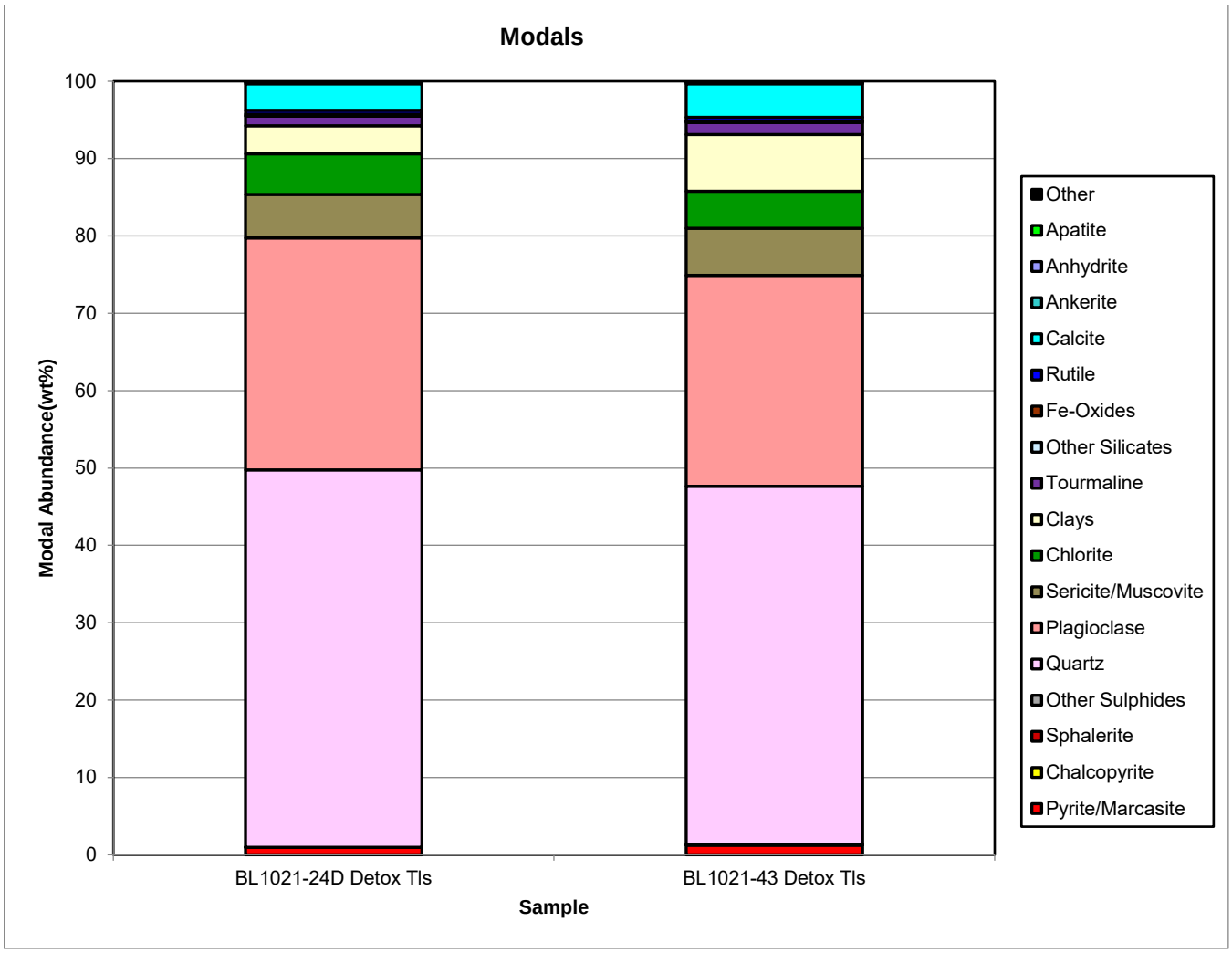
* Note: "C (QEMSCAN)" reflects carbonate carbon since QEMSCAN cannot measure graphitic or organic carbon.

Marathon Gold
16863-02
MI5051-NOV22

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Modals

Sample		BL1021-24D Detox Tls	BL1021-43 Detox Tls
Fraction		**-300/+3um**	**-300/+3um**
Calculated ESD Particle Size (µm)		33	32
Mineral Mass (%)	Pyrite/Marcasite	0.95	1.27
	Chalcopyrite	0.01	0.01
	Sphalerite	0.00	0.00
	Other Sulphides	0.00	0.00
	Quartz	48.8	46.4
	Plagioclase	30.0	27.3
	Sericite/Muscovite	5.61	6.07
	Chlorite	5.26	4.80
	Clays	3.61	7.32
	Tourmaline	1.26	1.54
	Other Silicates	0.09	0.14
	Fe-Oxides	0.16	0.07
	Rutile	0.49	0.46
	Calcite	3.45	4.34
	Ankerite	0.20	0.21
	Anhydrite	0.02	0.01
	Apatite	0.09	0.10
	Other	0.02	0.02
	Total	100.0	100.0
Mean Grain Size by Frequency (µm)	Pyrite/Marcasite	10	11
	Chalcopyrite	10	10
	Sphalerite	6	8
	Other Sulphides	17	6
	Quartz	36	34
	Plagioclase	24	18
	Sericite/Muscovite	14	14
	Chlorite	20	19
	Clays	6	7
	Tourmaline	19	20
	Other Silicates	7	7
	Fe-Oxides	12	10
	Rutile	14	13
	Calcite	19	20
	Ankerite	20	21
	Anhydrite	11	8
	Apatite	13	14
	Other	8	7


Modals
Modal Abundance(wt%)
100
90
80
70
60
50
40
30
20
10
0
BL1021-24D Detox Tls
BL1021-43 Detox Tls
Sample
Other
Apatite
Anhydrite
Ankerite
Calcite
Rutile
Fe-Oxides
Other Silicates
Tourmaline
Clays
Chlorite
Sericite/Muscovite
Plagioclase
Quartz
Other Sulphides
Sphalerite
Chalcopyrite
Pyrite/Marcasite

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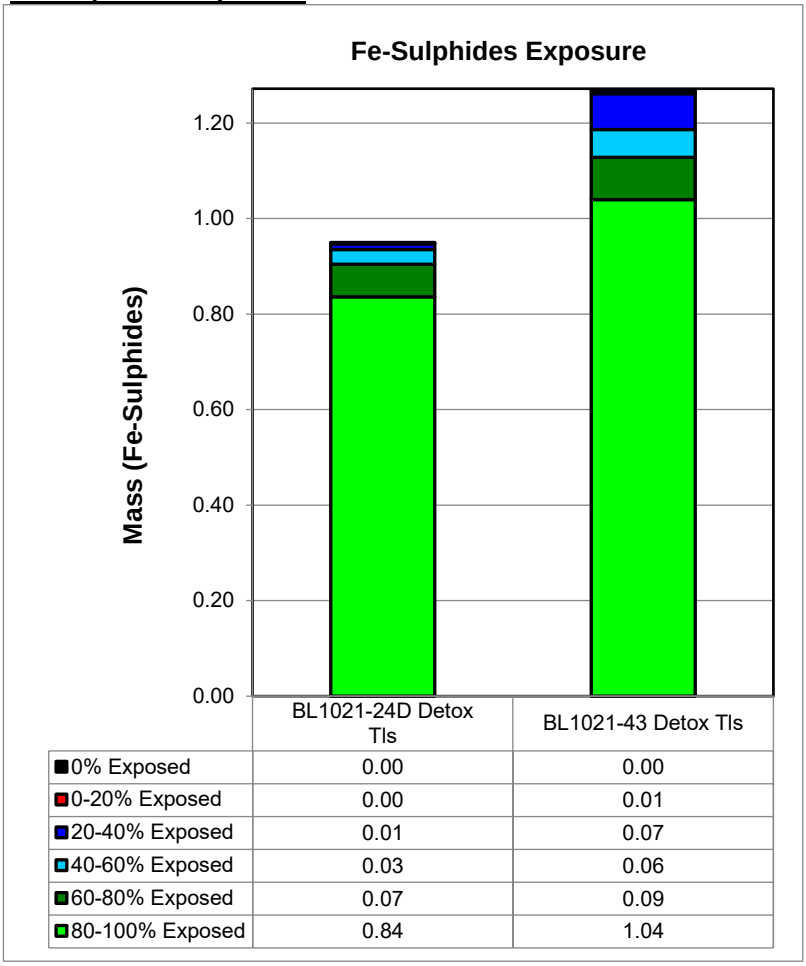
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

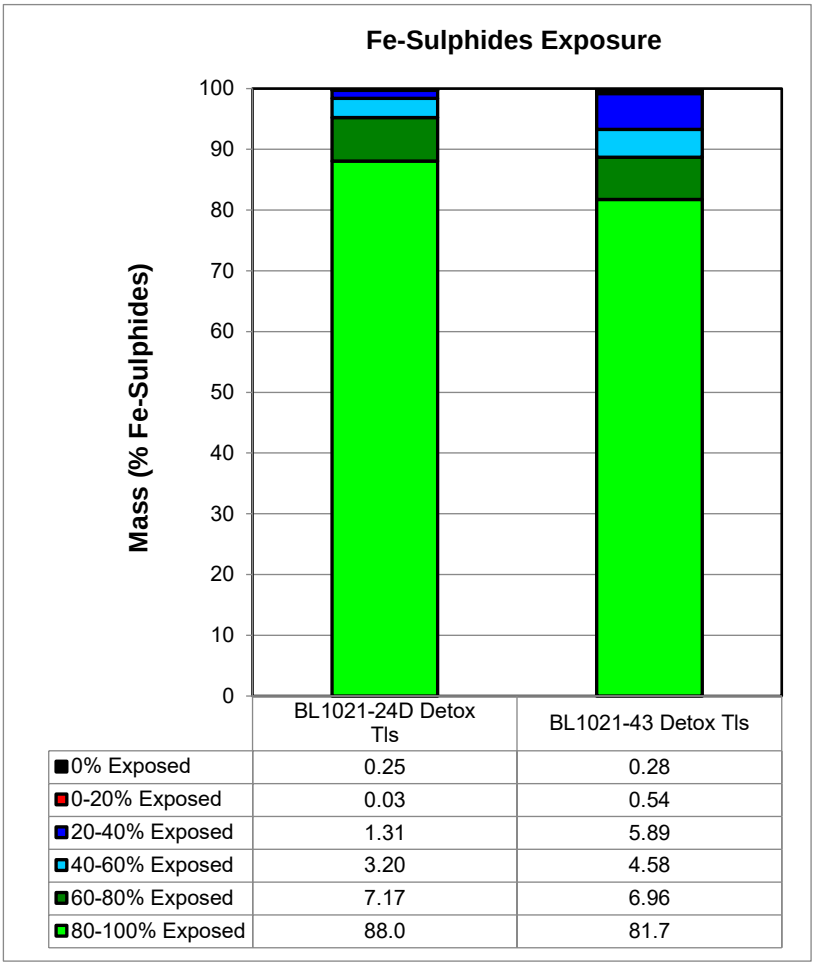
Fe-Sulphides Exposure



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
0% Exposed	0.00	0.00
0-20% Exposed	0.00	0.01
20-40% Exposed	0.01	0.07
40-60% Exposed	0.03	0.06
60-80% Exposed	0.07	0.09
80-100% Exposed	0.84	1.04

Absolute Mass of Fe-Sulphides Across Samples

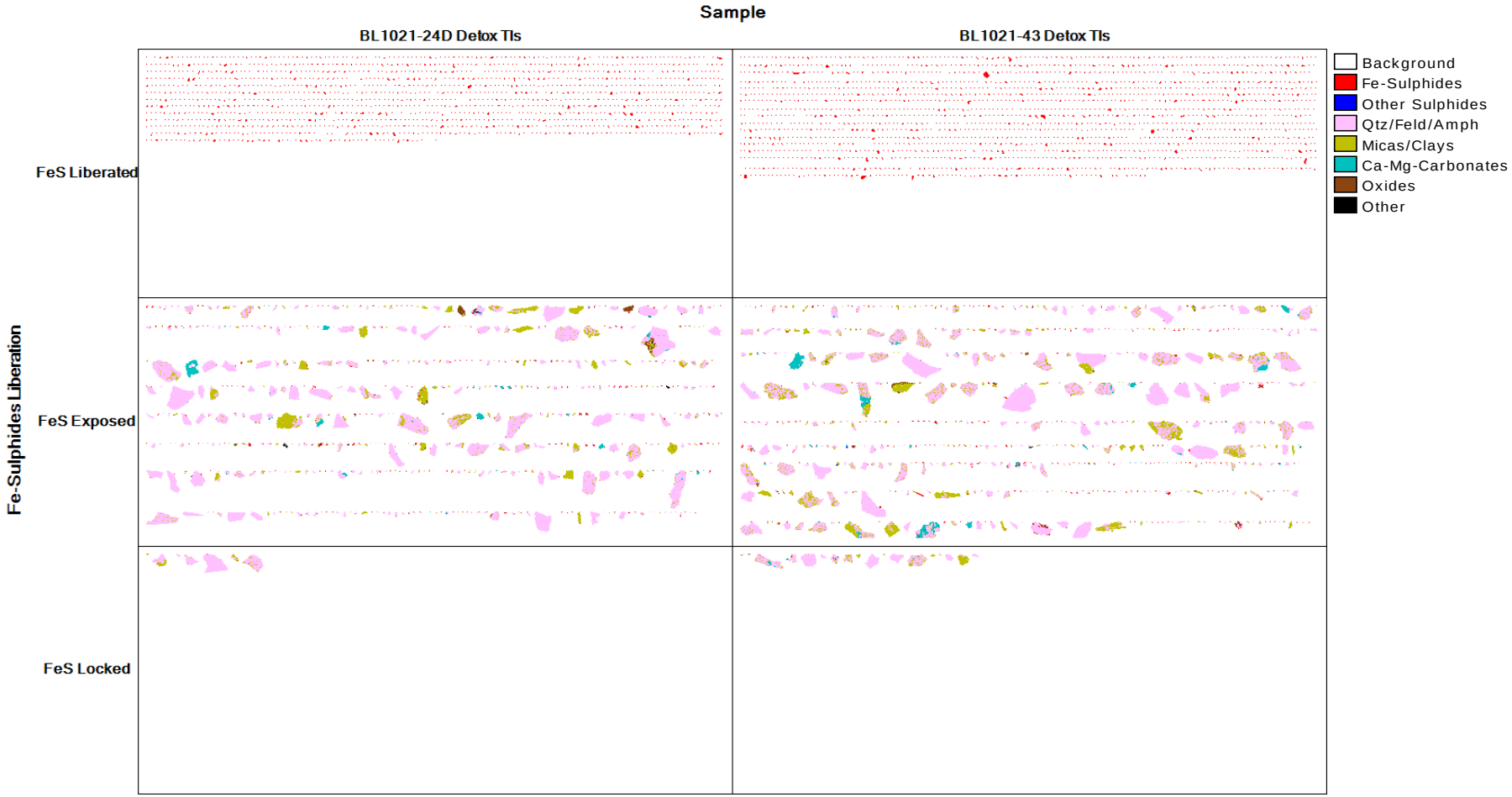
Mineral Name	BL1021-24D Detox Tls	BL1021-43 Detox Tls
80-100% Exposed	0.84	1.04
60-80% Exposed	0.07	0.09
40-60% Exposed	0.03	0.06
20-40% Exposed	0.01	0.07
0-20% Exposed	0.00	0.01
0% Exposed	0.00	0.00
Total	0.95	1.27



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
0% Exposed	0.25	0.28
0-20% Exposed	0.03	0.54
20-40% Exposed	1.31	5.89
40-60% Exposed	3.20	4.58
60-80% Exposed	7.17	6.96
80-100% Exposed	88.0	81.7

Normalized Mass of Fe-Sulphides Across Samples

Mineral Name	BL1021-24D Detox Tls	BL1021-43 Detox Tls
80-100% Exposed	88.0	81.7
60-80% Exposed	7.17	6.96
40-60% Exposed	3.20	4.58
20-40% Exposed	1.31	5.89
0-20% Exposed	0.03	0.54
0% Exposed	0.25	0.28
Total	100.0	100.0
Total Exposed	99.8	99.7


Sample
BL1021-24D Detox Tls
BL1021-43 Detox Tls
Fe-Sulphides Liberation
FeS Liberated
FeS Exposed
FeS Locked
Background
Fe-Sulphides
Other Sulphides
Qtz/Feld/Amph
Micas/Clays
Ca-Mg-Carbonates
Oxides
Other

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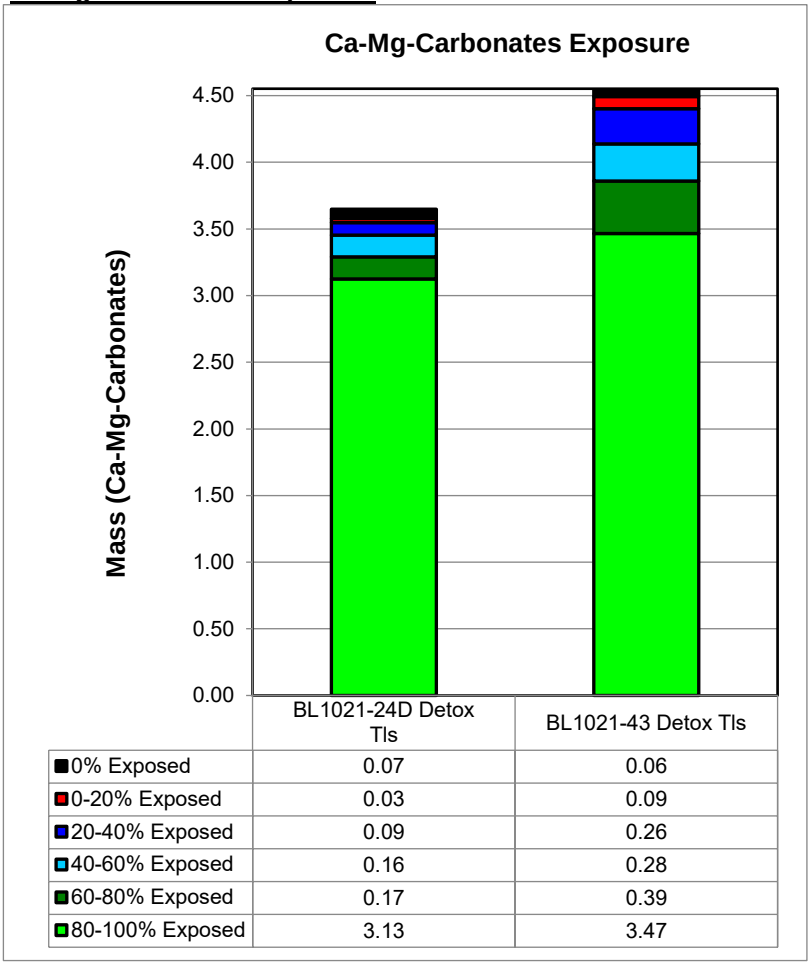
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

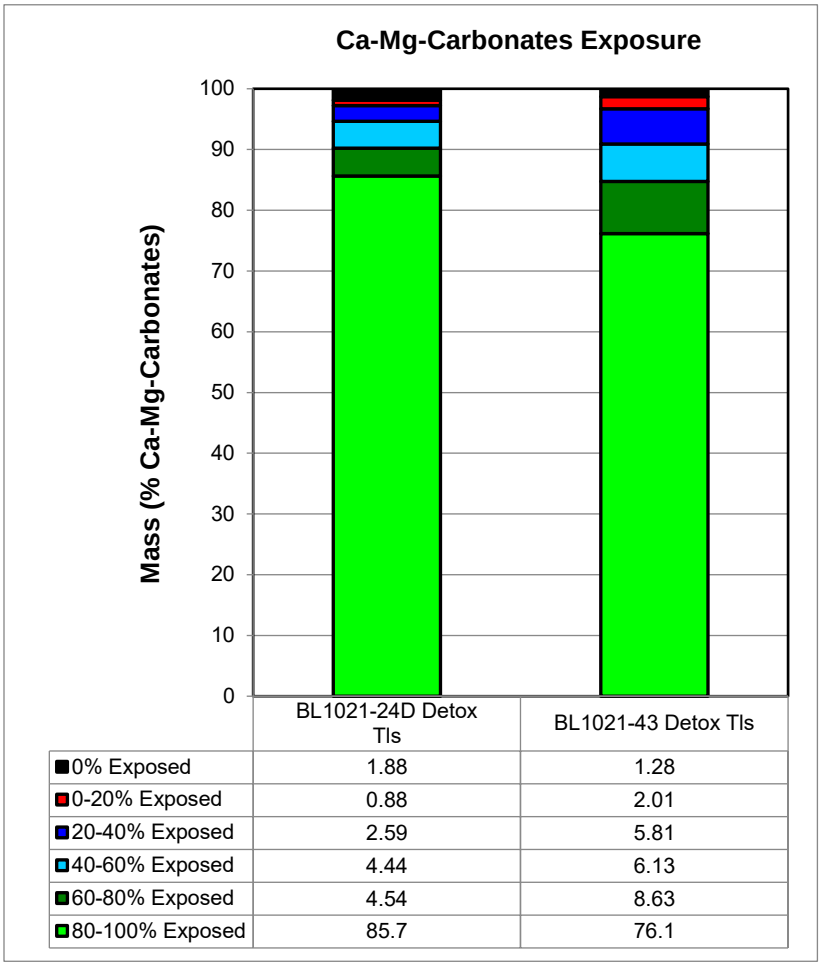
Ca-Mg-Carbonates Exposure



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
0% Exposed	0.07	0.06
0-20% Exposed	0.03	0.09
20-40% Exposed	0.09	0.26
40-60% Exposed	0.16	0.28
60-80% Exposed	0.17	0.39
80-100% Exposed	3.13	3.47

Absolute Mass of Ca-Mg-Carbonates Across Sampl

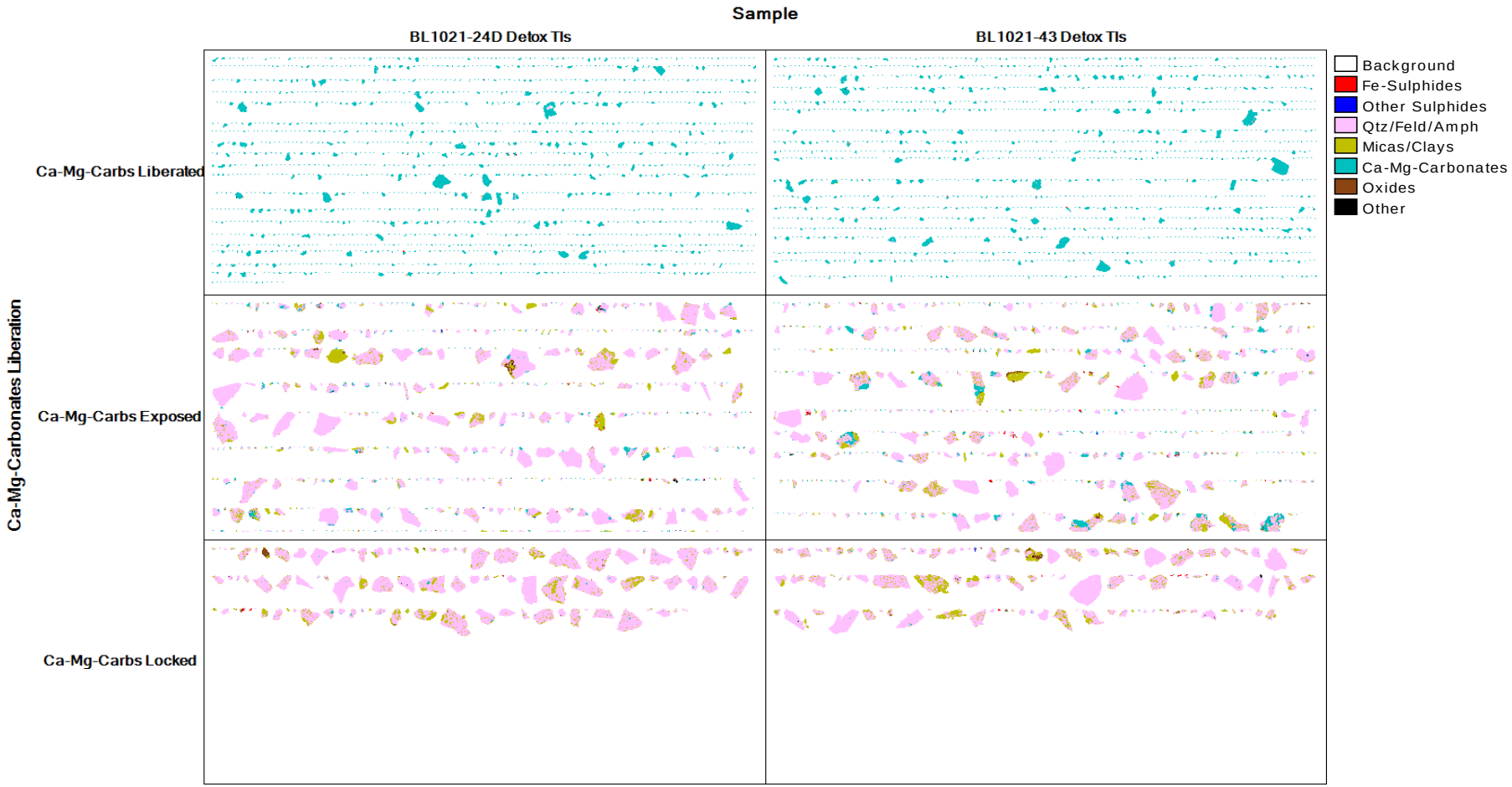
Mineral Name	BL1021-24D Detox Tls	BL1021-43 Detox Tls
80-100% Exposed	3.13	3.47
60-80% Exposed	0.17	0.39
40-60% Exposed	0.16	0.28
20-40% Exposed	0.09	0.26
0-20% Exposed	0.03	0.09
0% Exposed	0.07	0.06
Total	3.65	4.55



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
0% Exposed	1.88	1.28
0-20% Exposed	0.88	2.01
20-40% Exposed	2.59	5.81
40-60% Exposed	4.44	6.13
60-80% Exposed	4.54	8.63
80-100% Exposed	85.7	76.1

Normalized Mass of Ca-Mg-Carbonates Across Samples

Mineral Name	BL1021-24D Detox Tls	BL1021-43 Detox Tls
80-100% Exposed	85.7	76.1
60-80% Exposed	4.54	8.63
40-60% Exposed	4.44	6.13
20-40% Exposed	2.59	5.81
0-20% Exposed	0.88	2.01
0% Exposed	1.88	1.28
Total	100.0	100.0
Total Exposed	98.1	98.7


Sample
BL1021-24D Detox Tls
BL1021-43 Detox Tls
Ca-Mg-Carbonates Liberation
Ca-Mg-Carbs Liberated
Ca-Mg-Carbs Exposed
Ca-Mg-Carbs Locked
Background
Fe-Sulphides
Other Sulphides
Qtz/Feld/Amph
Micas/Clays
Ca-Mg-Carbonates
Oxides
Other

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16863-02
MI5051-NOV22

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Mineralogical Acid-Base Accounting

Parameter	BL1021-24D Detox Tls	BL1021-43 Detox Tls
NP from Ca-Mg Carbonates (tonnes CaCO3/1000 tonnes)	36.4	45.5
AP from Fe-Sulphides (tonnes CaCO3/1000 tonnes)	15.9	21.2
NP/AP	2.30	2.14
Available NP/AP	2.26	2.12

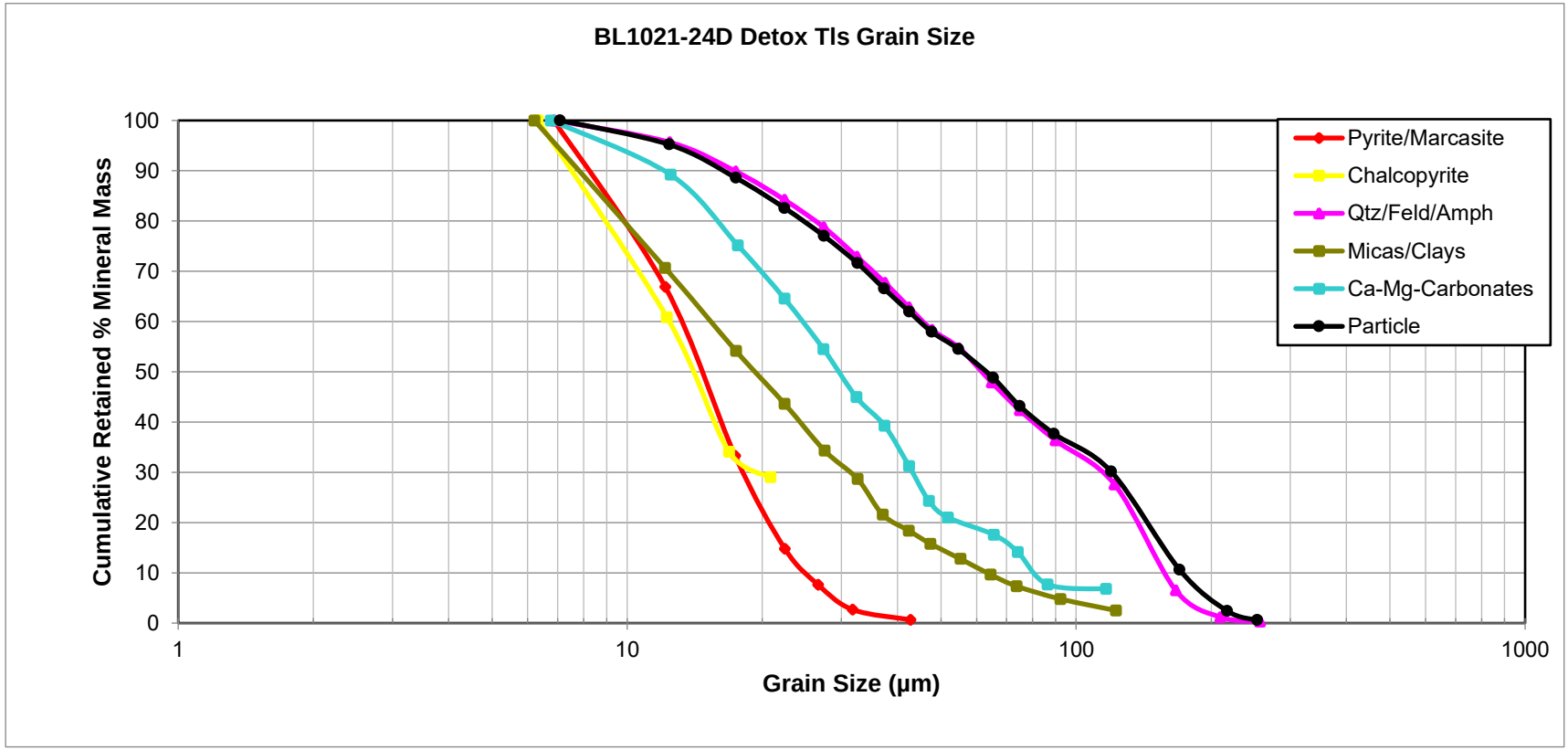
Notes:
NP = Neutralization Potential
AP = Acid Generation Potential
"Available NP/AP" takes into account the exposure of Ca-Mg-carbonates and Fe-sulphides

A carbonate/sulphide ratio > 2 indicates probable net neutralizing conditions. Only net acid consuming carbonates (Ca-Mg carbonates) are used for the mineralogical neutralization potential (NP) determination. Only Fe-sulphides are used for the mineralogical acid generation potential (AGP) as they are the main sulphides to contribute to net acidity.

In cases of low carbonate and sulphide abundance (typically <0.5 wt.% of each), values are only semi-quantitative due to low particle statistics for study. More replicate analyses are recommended to properly quantify the NP/AGP potential of these samples.

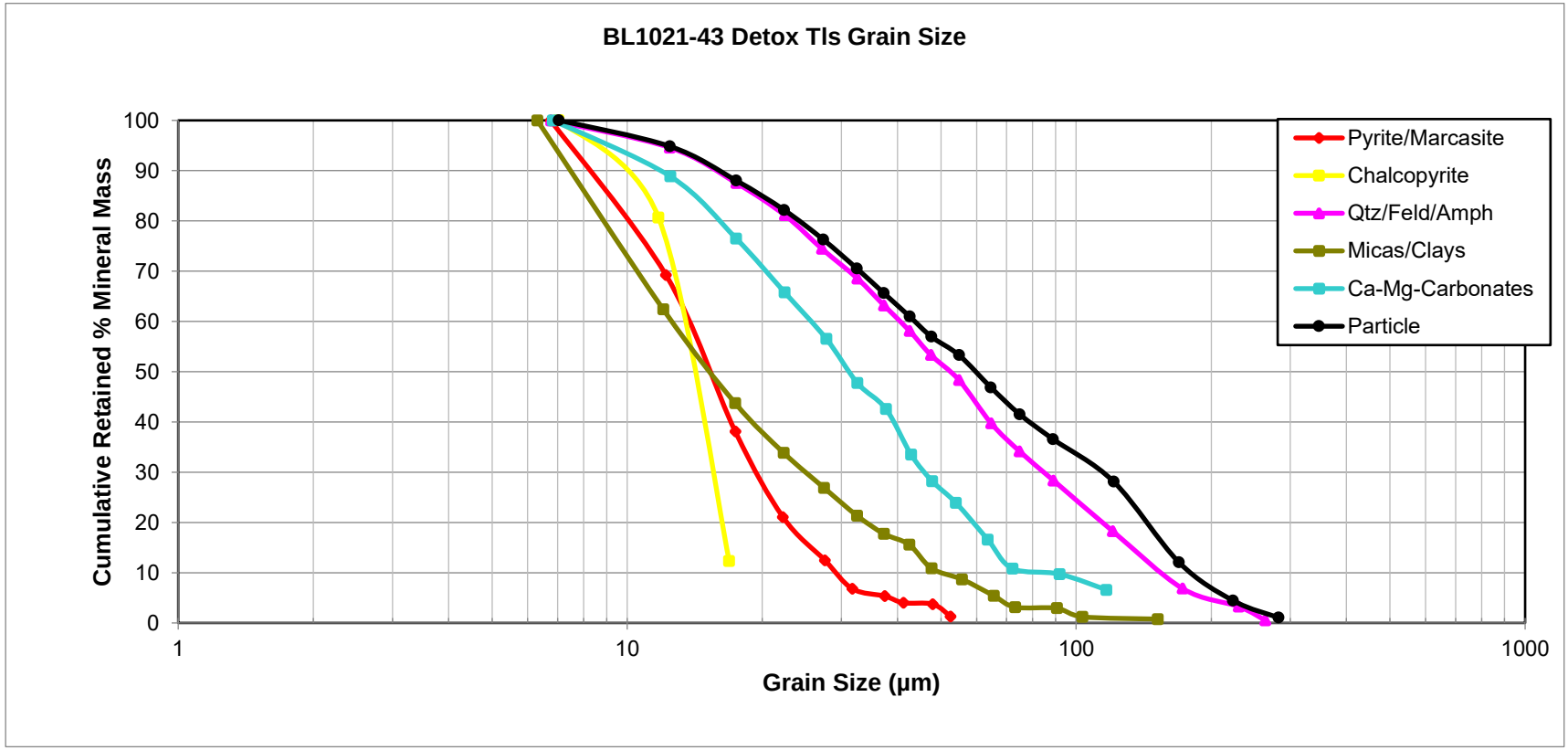
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Cumulative Retained Grain Size Distribution



High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Cumulative Retained Grain Size Distribution



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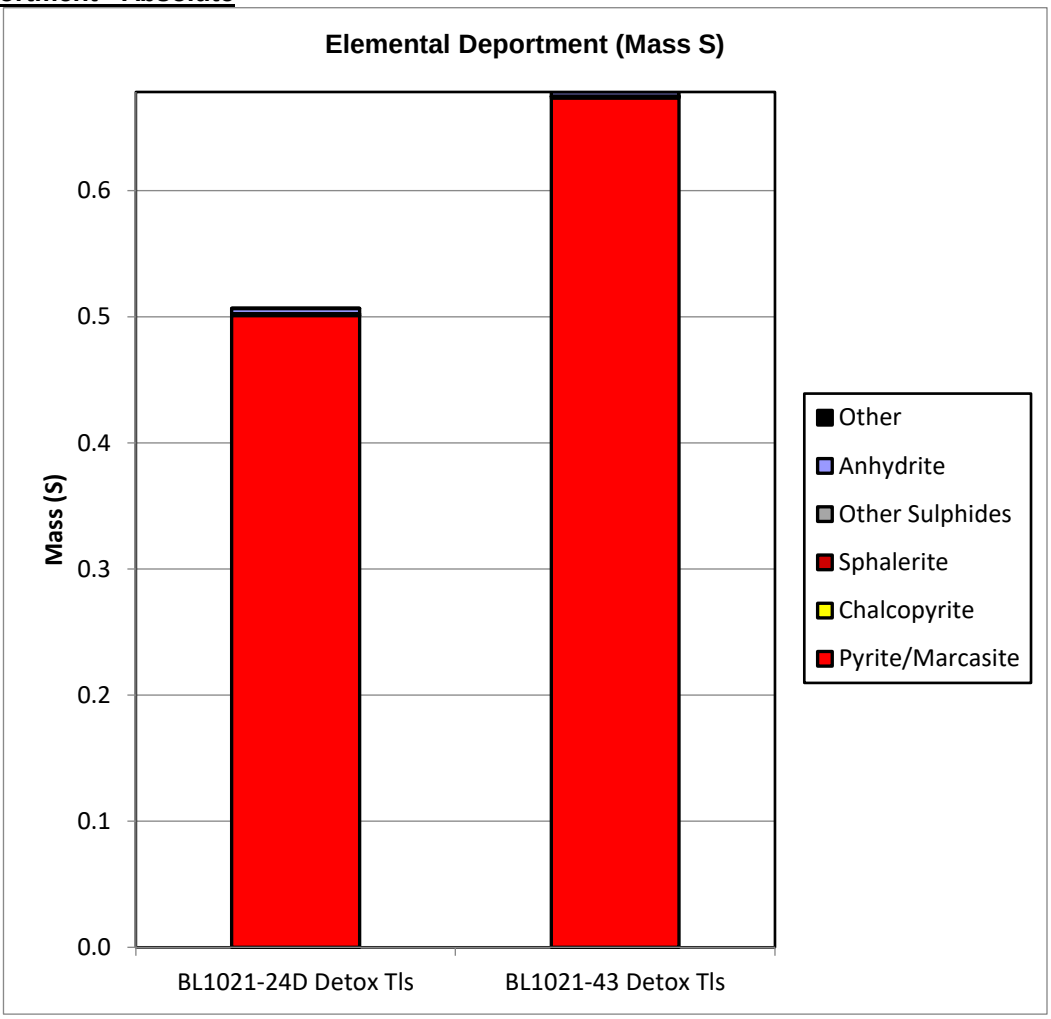
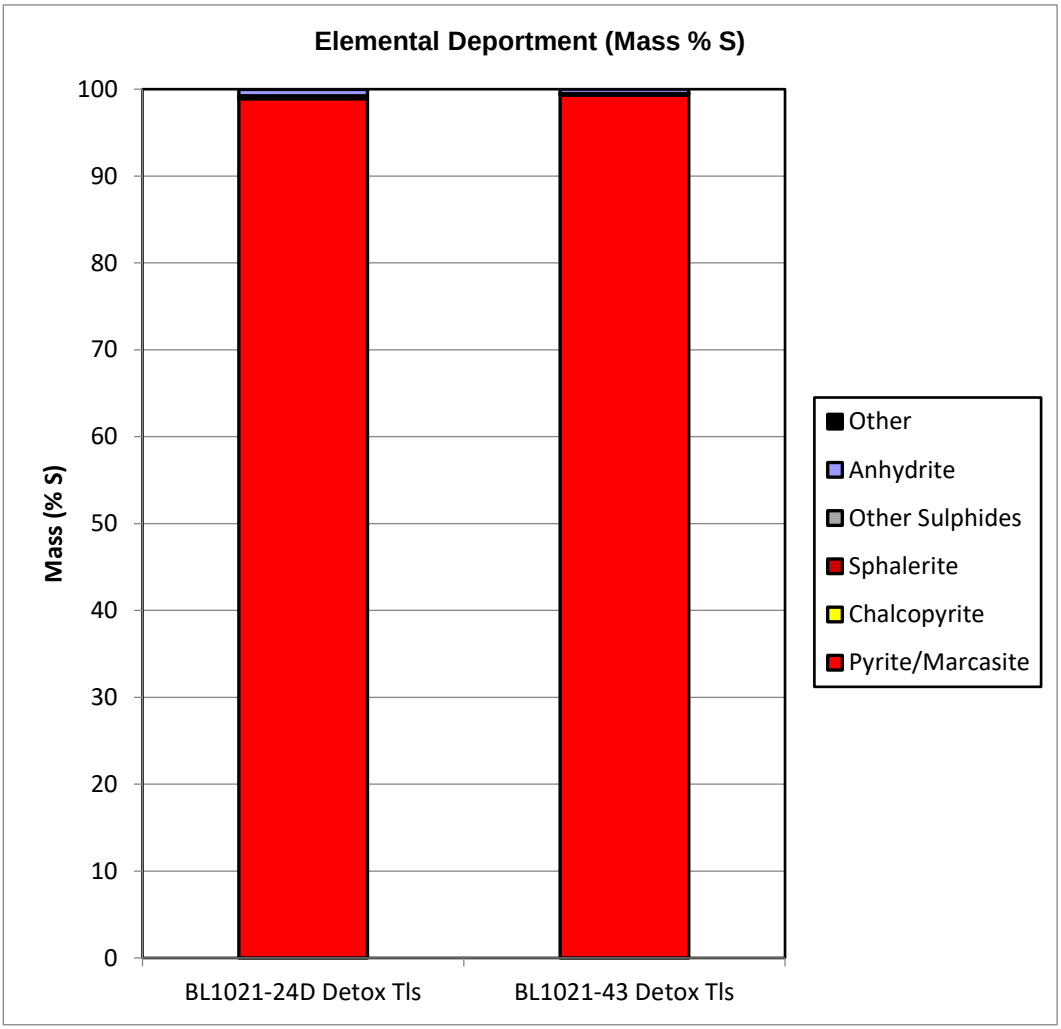
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

S Deportment - Absolute



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Pyrite/Marcasite	0.50	0.67
Chalcopyrite	0.00	0.00
Sphalerite	0.00	0.00
Other Sulphides	0.00	0.00
Anhydrite	0.00	0.00
Other	0.00	0.00
Total	0.51	0.68

S Deportment - Normalized



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Pyrite/Marcasite	98.9	99.3
Chalcopyrite	0.04	0.16
Sphalerite	0.06	0.03
Other Sulphides	0.21	0.02
Anhydrite	0.77	0.49
Other	0.01	0.00
Total	100.0	100.0

Marathon Gold
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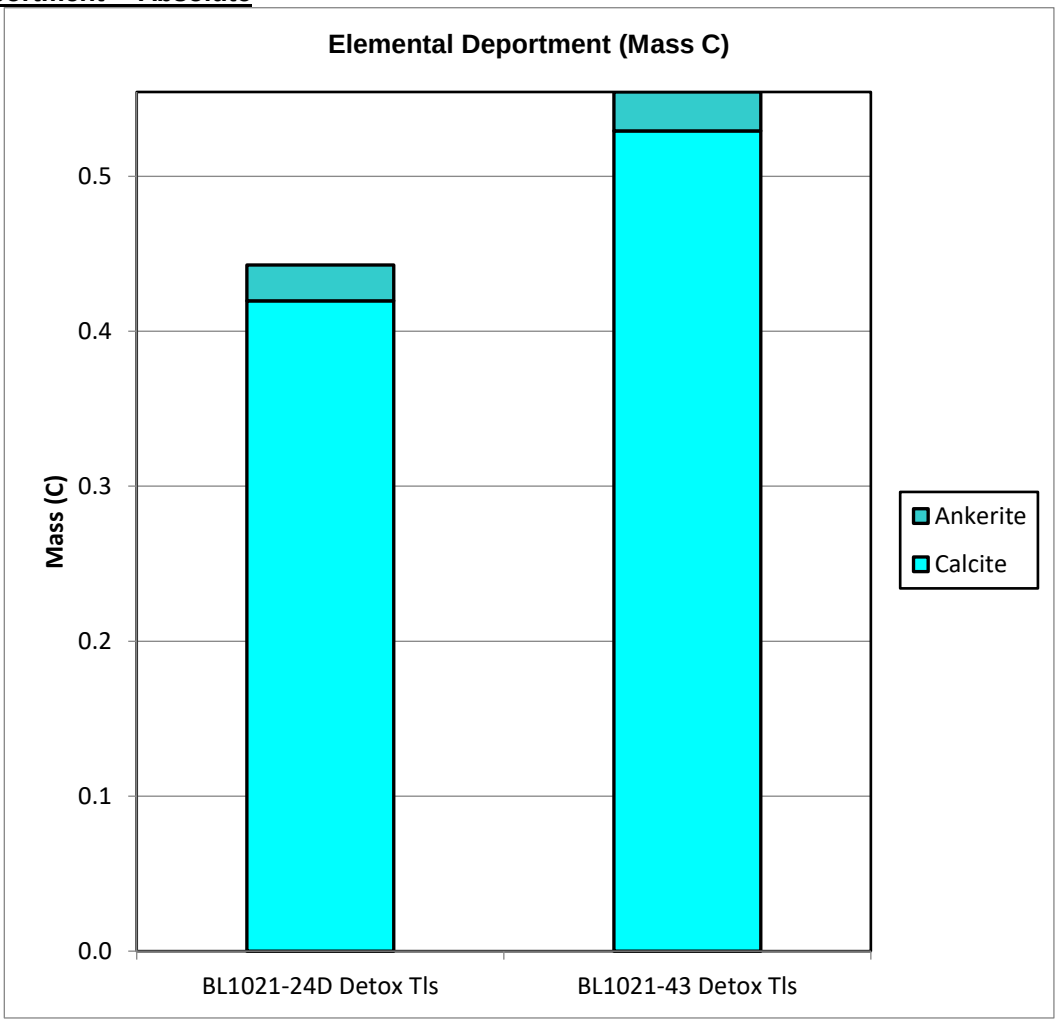
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

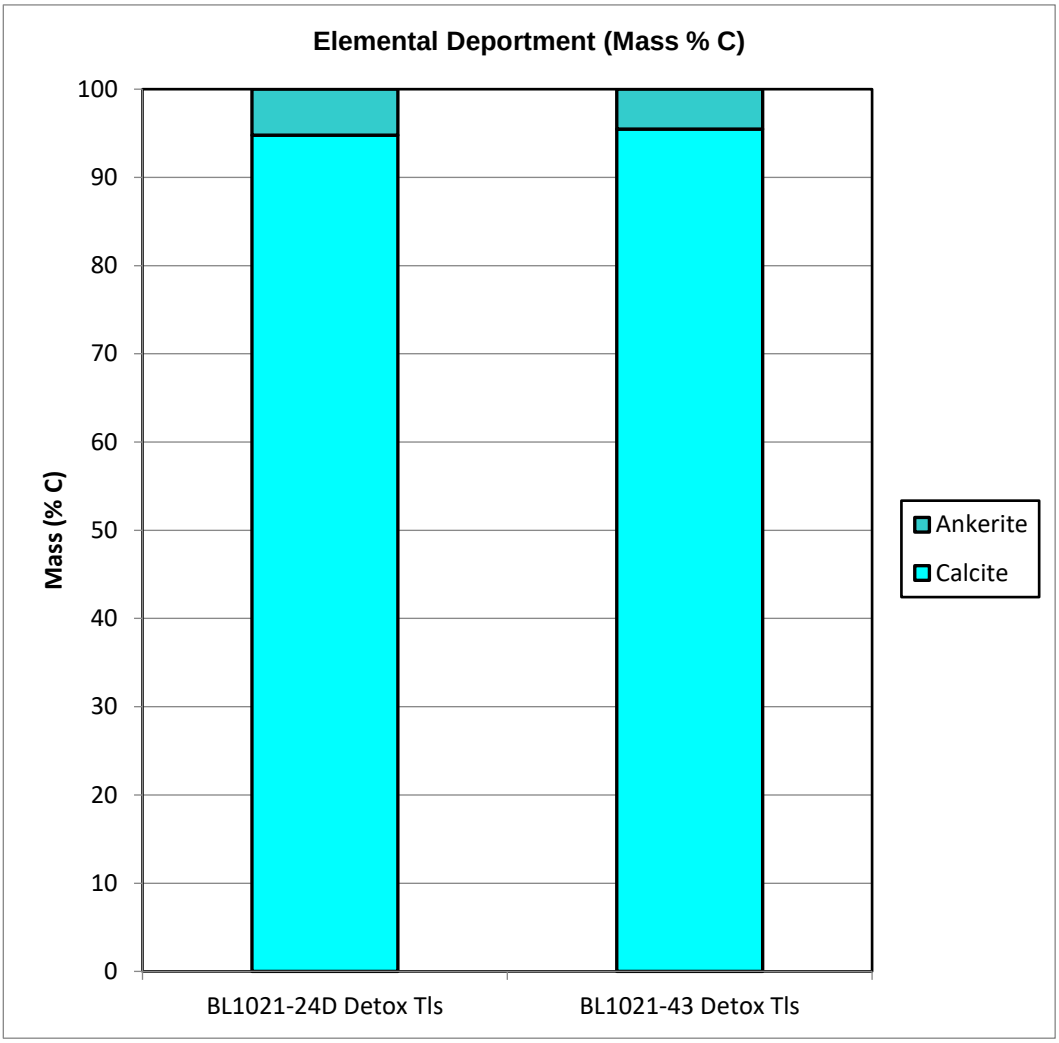
C Deportment* - Absolute



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Calcite	0.42	0.53
Ankerite	0.02	0.03
Total	0.44	0.55

*Carbon deportment is for carbonate carbon only.

C Deportment* - Normalized



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Calcite	94.8	95.5
Ankerite	5.23	4.53
Total	100.0	100.0

*Carbon deportment is for carbonate carbon only.

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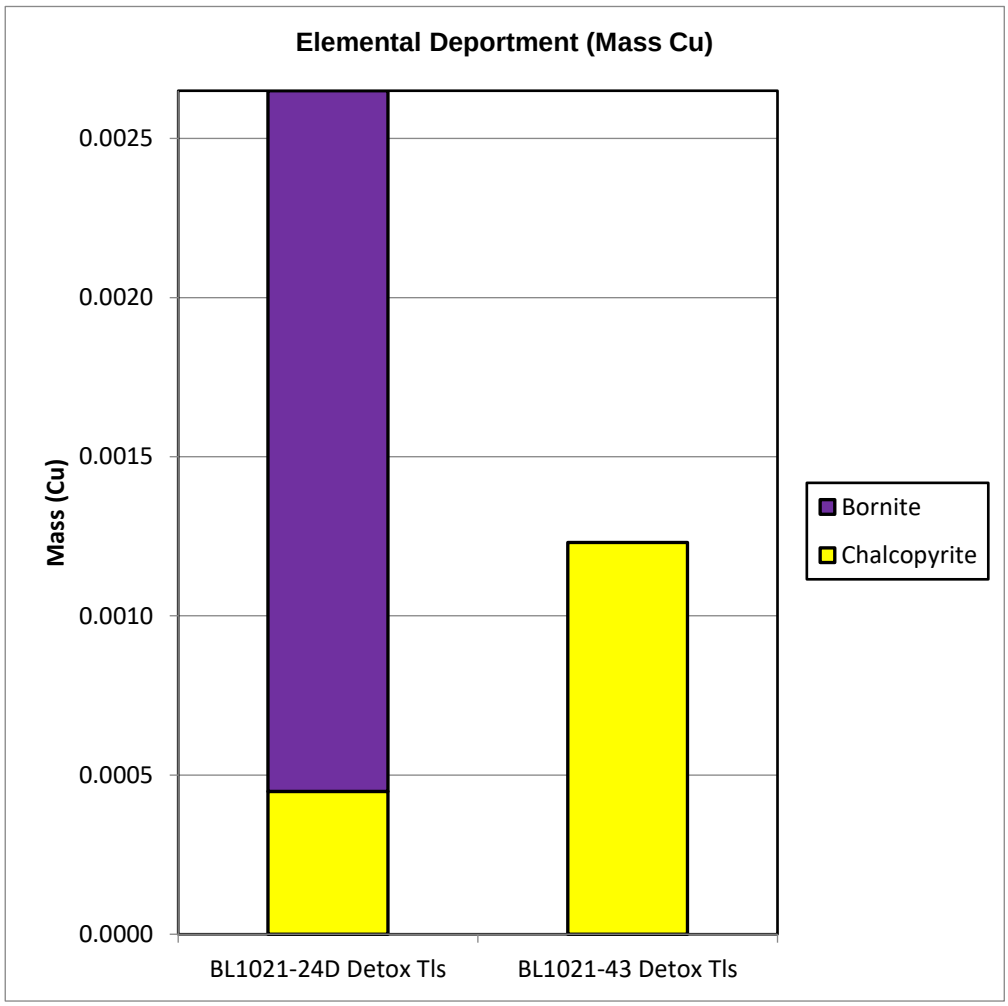
MI5051-NOV22

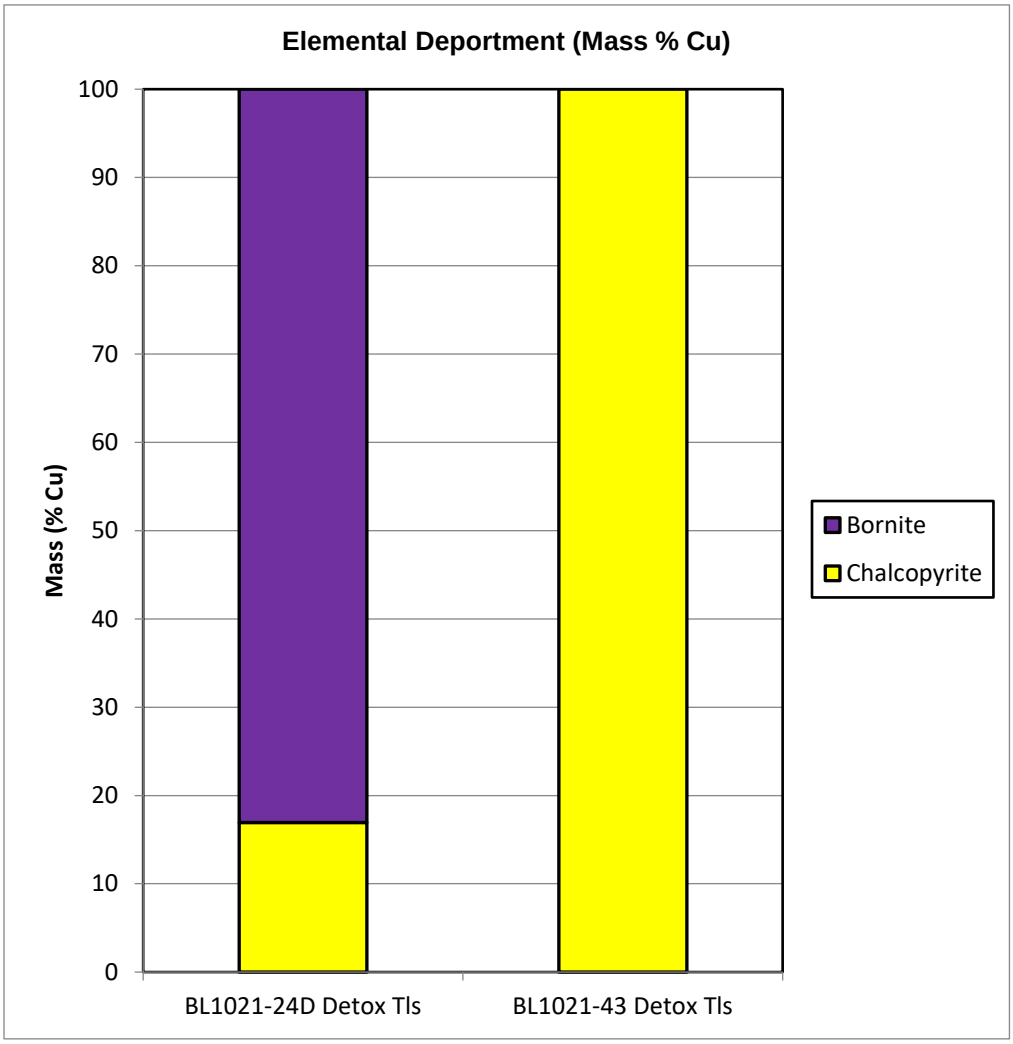
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Cu Deportment - Absolute



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Chalcopyrite	0.0004	0.0012
Bornite	0.0022	0.0000
Total	0.0026	0.0012

Cu Deportment - Normalized



	BL1021-24D Detox Tls	BL1021-43 Detox Tls
Chalcopyrite	16.9	100.0
Bornite	83.1	0.00
Total	100.0	100.0

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 1

Project : Berry Project

30-January-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 12 January 2023
LR Report: **CA10086-JAN23**
Reference: Wk#4 - Berry Project

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#4	6: B SED-High SFE Wk#4	7: B QTP-PAG Wk#4	8: B LGO-PAG Wk#4	9: B HGO-PAG-ZnB Wk#4	10: OB-ML Wk#4
Sample Date & Time			12-Jan-23	12-Jan-23	12-Jan-23	12-Jan-23	12-Jan-23	12-Jan-23
HumCell Leachate Vol [mL]	13-Jan-23	10:08	622	719	594	582	650	424
pH [No unit]	17-Jan-23	13:34	7.80	8.13	8.45	8.17	8.43	7.00
Acidity [mg/L as CaCO3]	17-Jan-23	13:34	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	17-Jan-23	13:34	15	20	11	10	10	5
Conductivity [uS/cm]	17-Jan-23	13:34	48	46	38	54	30	180
SO4 [mg/L]	26-Jan-23	06:12	7.1	3.5	6.7	14	3.9	79
F [mg/L]	13-Jan-23	10:21	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	16-Jan-23	12:33	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	26-Jan-23	16:26	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	26-Jan-23	16:26	0.029	0.054	0.057	0.050	0.038	0.081
As [mg/L]	26-Jan-23	16:26	< 0.0002	0.0005	0.0002	< 0.0002	0.0004	0.0016
Ba [mg/L]	26-Jan-23	16:26	0.00040	0.00229	0.00098	0.00040	0.00051	0.00939
Be [mg/L]	26-Jan-23	16:26	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	26-Jan-23	16:26	0.004	0.007	0.004	0.003	0.006	< 0.002
Bi [mg/L]	26-Jan-23	16:26	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00003	< 0.00001
Ca [mg/L]	26-Jan-23	16:26	7.80	6.12	5.80	8.99	4.55	33.5
Cd [mg/L]	26-Jan-23	16:26	0.000005	0.000010	< 0.000003	< 0.000003	< 0.000003	0.000035
Co [mg/L]	26-Jan-23	16:26	0.000016	0.000082	0.000030	0.000019	0.000023	0.000172
Cr [mg/L]	26-Jan-23	16:26	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00013
Cu [mg/L]	26-Jan-23	16:26	0.0004	0.0003	0.0003	0.0005	< 0.0002	0.0032
Fe [mg/L]	26-Jan-23	16:26	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	0.072
K [mg/L]	26-Jan-23	16:26	0.529	2.08	0.585	0.407	0.312	0.390
Li [mg/L]	26-Jan-23	16:26	0.0002	0.0002	0.0002	0.0002	0.0001	< 0.0001
Mg [mg/L]	26-Jan-23	16:26	0.539	0.741	0.295	0.313	0.251	0.960
Mn [mg/L]	26-Jan-23	16:26	0.0768	0.0285	0.0262	0.0283	0.0396	0.0510
Mo [mg/L]	26-Jan-23	16:26	0.00292	0.0354	0.00123	0.00072	0.00084	0.00245
Na [mg/L]	26-Jan-23	16:26	0.83	1.60	0.84	0.53	0.66	0.24
Ni [mg/L]	26-Jan-23	16:26	0.0004	0.0004	0.0003	0.0002	0.0003	0.0007
Pb [mg/L]	26-Jan-23	16:26	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	26-Jan-23	16:26	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	26-Jan-23	16:26	0.00010	0.00008	0.00005	0.00005	0.00009	0.00144
Sr [mg/L]	26-Jan-23	16:26	0.00604	0.0566	0.0139	0.0119	0.0114	0.0442
Sn [mg/L]	26-Jan-23	16:26	0.00071	0.00034	0.00094	< 0.00006	0.00016	0.00016

OnLine LIMS

0003212909

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10086-JAN23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#4	6: B SED-High SFE Wk#4	7: B QTP-PAG Wk#4	8: B LGO-PAG Wk#4	9: B HGO-PAG-ZnB Wk#4	10: OB-ML Wk#4
Ti [mg/L]	26-Jan-23	16:26	0.00006	0.00013	0.00020	0.00007	0.00023	0.00331
Tl [mg/L]	26-Jan-23	16:26	< 0.000005	0.000011	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	26-Jan-23	16:26	0.000299	0.0131	0.000396	0.000384	0.000490	0.000103
V [mg/L]	26-Jan-23	16:26	0.00002	0.00054	0.00009	0.00004	0.00008	0.00159
W [mg/L]	26-Jan-23	16:26	0.00016	0.00038	0.00012	0.00012	0.00032	0.00015
Y [mg/L]	26-Jan-23	16:26	0.00002	0.00008	0.00004	< 0.00002	< 0.00002	0.00008
Zn [mg/L]	26-Jan-23	16:26	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003212909

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P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 2

Project : Berry Project

30-January-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 26 January 2023
LR Report: **CA10183-JAN23**
Reference: Wk#5 - Berry Project (Set 2)

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#5	6: B SED Wk#5	7: B MD Wk#5	8: B QTP Wk#5	9: B LGO Wk#5	10: B HGO Wk#5
Sample Date & Time			26-Jan-23	26-Jan-23	26-Jan-23	26-Jan-23	26-Jan-23	26-Jan-23
HumCell Leachate Vol [mL]	27-Jan-23	11:09	872	895	882	864	857	884
pH [No unit]	30-Jan-23	11:54	7.48	7.51	7.56	7.62	7.49	7.43
Conductivity [uS/cm]	30-Jan-23	11:54	30	37	37	27	27	37

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003213158

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Lakefield - Ontario - KOL 2HO
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Marathon - Berry Set 1

Project : Berry Project

06-February-2023

Date Rec. : 02 February 2023
LR Report: **CA10021-FEB23**
Reference: Wk#7 - Berry Project

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Attn : James Powell

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Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#7	6: B SED-High SFE Wk#7	7: B QTP-PAG Wk#7	8: B LGO-PAG Wk#7	9: B HGO-PAG-Zn Wk#7	10: B OB-ML Wk#7
Sample Date & Time			02-Feb-23	02-Feb-23	02-Feb-23	02-Feb-23	02-Feb-23	02-Feb-23
HumCell Leachate Vol [mL]	06-Feb-23	10:23	637	701	646	603	700	536
pH [No unit]	03-Feb-23	10:42	7.27	7.70	7.46	7.28	7.37	6.73
Conductivity [uS/cm]	03-Feb-23	10:42	40	44	36	47	30	95

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

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SGS Canada Inc.
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Lakefield - Ontario - KOL 2HO
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Marathon - Berry Set 2

Project : Berry Project

06-February-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 19 January 2023
LR Report: **CA10135-JAN23**
Reference: Wk#4 - Berry Project (Set 2)

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#4	6: B SED Wk#4	7: B MD Wk#4	8: B QTP Wk#4	9: B LGO Wk#4	10: B HGO Wk#4
Sample Date & Time			18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23
HumCell Leachate Vol [mL]	20-Jan-23	15:11	928	931	911	959	930	913
pH [No unit]	20-Jan-23	12:06	9.03	8.94	8.91	8.91	8.96	8.67
Acidity [mg/L as CaCO3]	20-Jan-23	12:06	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	20-Jan-23	12:06	13	15	15	13	12	11
Conductivity [uS/cm]	20-Jan-23	12:06	28	32	33	27	27	30
SO4 [mg/L]	02-Feb-23	15:11	1.4	1.0	1.9	1.1	1.7	3.4
F [mg/L]	23-Jan-23	09:05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	20-Jan-23	15:49	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	24-Jan-23	15:49	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	24-Jan-23	15:49	0.057	0.090	0.073	0.046	0.061	0.040
As [mg/L]	24-Jan-23	15:49	0.0010	0.0004	0.0003	< 0.0002	< 0.0002	0.0003
Ba [mg/L]	24-Jan-23	15:49	0.00063	0.00713	0.00084	0.00035	0.00046	0.00029
Be [mg/L]	24-Jan-23	15:49	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	24-Jan-23	15:49	0.009	0.008	0.006	0.012	0.006	0.008
Bi [mg/L]	24-Jan-23	15:49	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	24-Jan-23	15:49	3.82	4.23	5.20	3.86	3.97	4.62
Cd [mg/L]	24-Jan-23	15:49	0.000017	< 0.000003	< 0.000003	0.000003	< 0.000003	< 0.000003
Co [mg/L]	24-Jan-23	15:49	0.000012	0.000013	0.000014	0.000013	0.000018	0.000031
Cr [mg/L]	24-Jan-23	15:49	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	24-Jan-23	15:49	0.0007	0.0007	0.0006	0.0011	0.0018	0.0008
Fe [mg/L]	24-Jan-23	15:49	< 0.007	< 0.007	0.009	< 0.007	< 0.007	< 0.007
K [mg/L]	24-Jan-23	15:49	0.775	0.957	0.594	0.583	0.459	0.443
Li [mg/L]	24-Jan-23	15:49	0.0002	0.0002	< 0.0001	0.0002	0.0002	< 0.0001
Mg [mg/L]	24-Jan-23	15:49	0.203	0.390	0.463	0.256	0.191	0.241
Mn [mg/L]	24-Jan-23	15:49	0.0281	0.0230	0.0166	0.0353	0.0315	0.0392
Mo [mg/L]	24-Jan-23	15:49	0.00154	0.00089	0.00140	0.00250	0.00045	0.00208
Na [mg/L]	24-Jan-23	15:49	1.26	1.26	0.91	0.87	0.98	1.13
Ni [mg/L]	24-Jan-23	15:49	0.0002	0.0002	0.0003	0.0004	0.0005	0.0003
Pb [mg/L]	24-Jan-23	15:49	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	24-Jan-23	15:49	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	24-Jan-23	15:49	0.00011	< 0.00004	0.00004	< 0.00004	< 0.00004	< 0.00004
Sr [mg/L]	24-Jan-23	15:49	0.00487	0.0357	0.0174	0.0108	0.00855	0.00936

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Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10135-JAN23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#4	6: B SED Wk#4	7: B MD Wk#4	8: B QTP Wk#4	9: B LGO Wk#4	10: B HGO Wk#4
Sn [mg/L]	24-Jan-23	15:49	< 0.00006	0.00017	< 0.00006	< 0.00006	< 0.00006	0.00010
Ti [mg/L]	24-Jan-23	15:49	0.00015	0.00009	0.00031	0.00024	0.00041	0.00017
Tl [mg/L]	24-Jan-23	15:49	< 0.000005	< 0.000005	< 0.000005	0.000008	< 0.000005	< 0.000005
U [mg/L]	30-Jan-23	14:27	0.00139	0.000265	0.00206	0.00141	0.000268	0.00541
V [mg/L]	24-Jan-23	15:49	0.00019	0.00058	0.00789	0.00018	0.00015	0.00013
W [mg/L]	24-Jan-23	15:49	0.00018	0.00017	0.00009	0.00042	0.00012	0.00015
Y [mg/L]	24-Jan-23	15:49	0.00003	0.00002	< 0.00002	0.00004	0.00004	0.00004
Zn [mg/L]	24-Jan-23	15:49	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

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Marathon - Berry Set 2

Project : Berry Project

07-February-2023

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Date Rec. : 03 February 2023
LR Report: **CA14053-FEB23**
Reference: Wk#4 - Berry Project (Set 2)

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#4	6: B SED Wk#4	7: B MD Wk#4	8: B QTP Wk#4	9: B LGO Wk#4	10: B HGO Wk#4
Sample Date & Time			18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23
pH [No unit]	07-Feb-23	10:46	8.87	8.91	8.84	7.64	7.60	7.03

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Marathon - Berry Set 1

Project : Berry Project

10-February-2023

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Date Rec. : 26 January 2023
LR Report: **CA10182-JAN23**
Reference: Wk#6 - Berry Project (Berry Set 1)

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#6	6: B SED-High SFE Wk#6	7: B QTP-PAG Wk#6	8: B LGO-PAG Wk#6	9: B HGO-PAG-ZnB Wk#6	10: OB-ML Wk#6
Sample Date & Time			26-Jan-23	26-Jan-23	26-Jan-23	26-Jan-23	26-Jan-23	26-Jan-23
HumCell Leachate Vol [mL]	27-Jan-23	11:09	611	700	623	611	657	459
pH [No unit]	30-Jan-23	11:41	7.07	7.59	6.97	6.91	6.84	6.61
Acidity [mg/L as CaCO3]	30-Jan-23	11:41	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	30-Jan-23	11:41	24	30	17	14	8	6
Conductivity [uS/cm]	30-Jan-23	11:41	42	40	31	42	27	105
SO4 [mg/L]	07-Feb-23	17:11	11	2.8	7.0	10	4.8	43
F [mg/L]	27-Jan-23	08:58	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	30-Jan-23	15:46	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	30-Jan-23	15:38	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	30-Jan-23	15:38	0.036	0.074	0.055	0.046	0.048	0.235
As [mg/L]	31-Jan-23	14:16	< 0.0002	0.0007	0.0003	< 0.0002	0.0003	0.0018
Ba [mg/L]	30-Jan-23	15:38	0.00029	0.00213	0.00077	0.00035	0.00042	0.00820
Be [mg/L]	30-Jan-23	15:38	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	0.000013
B [mg/L]	30-Jan-23	15:38	0.005	0.006	0.005	0.003	0.002	< 0.002
Bi [mg/L]	30-Jan-23	15:38	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	0.00003
Ca [mg/L]	30-Jan-23	15:38	6.54	5.53	4.80	6.98	4.00	17.4
Cd [mg/L]	30-Jan-23	15:38	< 0.000003	0.000007	0.000003	< 0.000003	< 0.000003	0.000092
Co [mg/L]	30-Jan-23	15:38	0.000188	0.000020	0.00102	0.000022	0.000063	0.000260
Cr [mg/L]	30-Jan-23	15:38	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.00162	0.00179
Cu [mg/L]	30-Jan-23	15:38	0.0006	0.0002	0.0005	0.0002	< 0.0002	0.0140
Fe [mg/L]	30-Jan-23	15:38	0.008	0.009	0.009	< 0.007	0.055	0.203
K [mg/L]	30-Jan-23	15:38	0.381	1.70	0.365	0.251	0.225	0.334
Li [mg/L]	30-Jan-23	15:39	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0007
Mg [mg/L]	30-Jan-23	15:39	0.384	0.617	0.213	0.217	0.201	0.634
Mn [mg/L]	30-Jan-23	15:39	0.0556	0.0324	0.0293	0.0284	0.0313	0.0485
Mo [mg/L]	30-Jan-23	15:39	0.00577	0.0196	0.00364	0.00238	0.00287	0.00867
Na [mg/L]	30-Jan-23	15:39	0.52	0.86	0.38	0.30	0.35	0.18
Ni [mg/L]	30-Jan-23	15:39	0.0002	0.0002	0.0002	0.0002	0.0004	0.0031
Pb [mg/L]	30-Jan-23	15:39	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	0.00049
Sb [mg/L]	30-Jan-23	15:39	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0009
Se [mg/L]	30-Jan-23	15:39	0.00021	< 0.00004	< 0.00004	0.00009	< 0.00004	0.00070
Sr [mg/L]	30-Jan-23	15:39	0.00570	0.0512	0.0113	0.00919	0.0125	0.0289

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10182-JAN23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#6	6: B SED-High SFE Wk#6	7: B QTP-PAG Wk#6	8: B LGO-PAG Wk#6	9: B HGO-PAG-ZnB Wk#6	10: OB-ML Wk#6
Sn [mg/L]	30-Jan-23	15:39	0.00040	0.00027	0.00035	< 0.00006	0.00015	0.00048
Ti [mg/L]	30-Jan-23	15:39	0.00008	0.00044	0.00020	< 0.00005	0.00020	0.00508
Tl [mg/L]	30-Jan-23	15:39	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	30-Jan-23	15:39	0.00138	0.00127	0.000139	0.000788	0.00572	0.000112
V [mg/L]	30-Jan-23	15:39	0.00002	0.00058	0.00008	0.00004	0.00015	0.00188
W [mg/L]	30-Jan-23	15:39	0.00026	0.00040	0.00031	0.00046	0.00021	0.00017
Y [mg/L]	30-Jan-23	15:39	0.00003	0.00008	0.00003	< 0.00002	< 0.00002	0.00012
Zn [mg/L]	30-Jan-23	15:39	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.016

<original signed by>

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Marathon - Berry Set 2

Project : Berry Project

21-February-2023

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Date Rec. : 02 February 2023
LR Report: **CA10022-FEB23**
Reference: Wk#6 - Berry Project Set 2

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#6	6: B SED Wk#6	7: B MD Wk#6	8: B QTP Wk#6	9: B LGO Wk#6	10: B HGO Wk#6
Sample Date & Time			02-Feb-23	02-Feb-23	02-Feb-23	02-Feb-23	02-Feb-23	02-Feb-23
HumCell Leachate Vol [mL]	06-Feb-23	10:23	980	1005	1006	1016	991	1004
pH [No unit]	03-Feb-23	12:39	7.03	7.68	7.52	7.10	7.11	7.20
Acidity [mg/L as CaCO3]	03-Feb-23	12:39	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	03-Feb-23	12:39	14	15	16	12	10	10
Conductivity [uS/cm]	03-Feb-23	12:39	26	30	30	24	23	25
SO4 [mg/L]	09-Feb-23	13:32	0.9	0.8	1.2	0.7	1.3	2.4
F [mg/L]	03-Feb-23	12:50	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	19-Feb-23	13:37	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	08-Feb-23	13:39	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	08-Feb-23	13:39	0.040	0.061	0.051	0.039	0.032	0.029
As [mg/L]	08-Feb-23	13:39	0.0006	0.0005	0.0005	0.0005	0.0002	0.0004
Ba [mg/L]	08-Feb-23	13:39	0.00062	0.00726	0.00089	0.00046	0.00042	0.00031
Be [mg/L]	08-Feb-23	13:39	0.000008	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	08-Feb-23	13:39	0.024	0.015	0.009	0.015	0.018	0.016
Bi [mg/L]	08-Feb-23	13:39	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	0.00007
Ca [mg/L]	08-Feb-23	13:39	4.19	4.01	4.66	3.79	3.93	3.96
Cd [mg/L]	08-Feb-23	13:39	0.000015	< 0.000003	0.000004	0.000003	0.000005	< 0.000003
Co [mg/L]	08-Feb-23	13:39	0.000034	0.000034	0.000013	0.000018	0.000013	0.000048
Cr [mg/L]	08-Feb-23	13:39	< 0.00008	< 0.00008	0.00040	0.00045	< 0.00008	< 0.00008
Cu [mg/L]	08-Feb-23	13:39	0.0004	0.0006	0.0003	0.0010	0.0010	0.0005
Fe [mg/L]	08-Feb-23	13:39	< 0.007	< 0.007	0.011	0.012	< 0.007	< 0.007
K [mg/L]	08-Feb-23	13:39	0.584	0.706	0.430	0.423	0.293	0.294
Li [mg/L]	08-Feb-23	13:39	0.0004	0.0002	< 0.0001	0.0002	0.0002	< 0.0001
Mg [mg/L]	08-Feb-23	13:39	0.295	0.415	0.467	0.304	0.230	0.232
Mn [mg/L]	08-Feb-23	13:39	0.0311	0.0315	0.0189	0.0344	0.0329	0.0376
Mo [mg/L]	08-Feb-23	13:39	0.00163	0.00096	0.00142	0.00150	0.00056	0.00308
Na [mg/L]	08-Feb-23	13:39	0.52	0.55	0.42	0.45	0.45	0.47
Ni [mg/L]	08-Feb-23	13:39	0.0002	0.0002	0.0002	0.0004	0.0002	0.0004
Pb [mg/L]	08-Feb-23	13:39	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	08-Feb-23	13:39	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	08-Feb-23	13:39	0.00014	0.00019	0.00017	0.00048	< 0.00004	0.00043
Sr [mg/L]	08-Feb-23	13:39	0.00698	0.0407	0.0191	0.0133	0.0103	0.00942
Sn [mg/L]	08-Feb-23	13:39	0.00007	0.00040	0.00006	0.00007	0.00008	0.00026

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Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10022-FEB23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#6	6: B SED Wk#6	7: B MD Wk#6	8: B QTP Wk#6	9: B LGO Wk#6	10: B HGO Wk#6
Ti [mg/L]	08-Feb-23	13:39	0.00011	0.00012	0.00016	0.00042	0.00007	0.00011
Tl [mg/L]	08-Feb-23	13:39	0.000043	< 0.000005	< 0.000005	< 0.000005	< 0.000005	0.000053
U [mg/L]	08-Feb-23	13:39	0.00468	0.0124	0.000407	0.000823	0.000715	0.00448
V [mg/L]	08-Feb-23	13:39	0.00016	0.00058	0.00814	0.00015	0.00012	0.00010
W [mg/L]	08-Feb-23	13:39	0.00013	0.00020	0.00007	0.00011	0.00016	0.00016
Y [mg/L]	08-Feb-23	13:39	0.00002	0.00003	< 0.00002	0.00003	0.00004	0.00003
Zn [mg/L]	08-Feb-23	13:39	0.002	< 0.002	0.002	0.002	0.002	0.002

<original signed by>

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Project Specialist Assistant,
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Marathon - Berry Set 1

Project : Berry Project

21-February-2023

Marathon Gold Corp
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Phone: 709-730-5046
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Date Rec. : 09 February 2023
LR Report: **CA10067-FEB23**
Reference: Wk#8 - Berry Project

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#8	6: B SED-High SFE Wk#8	7: B QTP-PAG Wk#8	8: B LGO-PAG Wk#8	9: B HGO-PAG-ZnB Wk#8	10: OB-ML Wk#8
Sample Date & Time			09-Feb-23	09-Feb-23	09-Feb-23	09-Feb-23	09-Feb-23	09-Feb-23
HumCell Leachate Vol [mL]	13-Feb-23	15:36	620	710	644	639	705	548
pH [No unit]	10-Feb-23	12:54	7.93	8.73	7.91	7.90	7.87	7.27
Acidity [mg/L as CaCO3]	15-Feb-23	11:10	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	10-Feb-23	12:54	14	22	11	11	10	8
Conductivity [uS/cm]	10-Feb-23	12:54	41	42	26	78	25	79
SO4 [mg/L]	16-Feb-23	15:35	4.7	1.9	2.2	22	2.7	22
F [mg/L]	14-Feb-23	09:06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	13-Feb-23	16:03	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002
Ag [mg/L]	13-Feb-23	16:03	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	13-Feb-23	16:03	0.032	0.052	0.038	0.040	0.031	0.098
As [mg/L]	13-Feb-23	16:03	< 0.0002	0.0019	0.0004	0.0003	0.0003	0.0046
Ba [mg/L]	13-Feb-23	16:03	0.00023	0.00185	0.00063	0.00037	0.00032	0.00665
Be [mg/L]	13-Feb-23	16:03	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	13-Feb-23	16:03	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bi [mg/L]	13-Feb-23	16:03	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	< 0.00001
Ca [mg/L]	13-Feb-23	16:03	6.74	5.30	3.91	12.9	3.68	11.7
Cd [mg/L]	13-Feb-23	16:03	< 0.000003	0.000006	< 0.000003	< 0.000003	< 0.000003	0.000028
Co [mg/L]	13-Feb-23	16:03	0.000012	0.000006	0.000025	0.000039	0.000133	0.000146
Cr [mg/L]	13-Feb-23	16:03	< 0.00008	< 0.00008	0.00030	0.00052	0.00029	0.00015
Cu [mg/L]	13-Feb-23	16:03	0.0003	0.0005	< 0.0002	0.0004	0.0015	0.0027
Fe [mg/L]	13-Feb-23	16:03	< 0.007	< 0.007	0.014	0.018	0.014	0.091
K [mg/L]	13-Feb-23	16:03	0.304	1.30	0.235	0.224	0.169	0.330
Li [mg/L]	13-Feb-23	16:03	< 0.0001	0.0002	< 0.0001	0.0001	< 0.0001	< 0.0001
Mg [mg/L]	13-Feb-23	16:03	0.314	0.513	0.150	0.220	0.156	0.540
Mn [mg/L]	13-Feb-23	16:03	0.0499	0.0332	0.0293	0.0271	0.0306	0.0409
Mo [mg/L]	13-Feb-23	16:03	0.00191	0.0123	0.00069	0.00255	0.00103	0.00346
Na [mg/L]	13-Feb-23	16:03	0.42	0.56	0.23	0.28	0.24	0.27
Ni [mg/L]	13-Feb-23	16:03	0.0003	0.0002	0.0003	0.0003	0.0008	0.0005
Pb [mg/L]	13-Feb-23	16:03	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	0.00010
Sb [mg/L]	13-Feb-23	16:03	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0010
Se [mg/L]	13-Feb-23	16:03	< 0.00004	< 0.00004	< 0.00004	0.00012	0.00011	0.00045
Sr [mg/L]	13-Feb-23	16:03	0.00452	0.0423	0.00712	0.0161	0.00872	0.0193
Sn [mg/L]	13-Feb-23	16:03	0.00038	0.00022	0.00089	< 0.00006	0.00013	0.00012

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Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#8	6: B SED-High SFE Wk#8	7: B QTP-PAG Wk#8	8: B LGO-PAG Wk#8	9: B HGO-PAG-ZnB Wk#8	10: OB-ML Wk#8
Ti [mg/L]	13-Feb-23	16:03	0.00013	0.00024	0.00021	0.00012	0.00013	0.00438
Tl [mg/L]	13-Feb-23	16:03	< 0.000005	< 0.000005	< 0.000005	0.000030	< 0.000005	< 0.000005
U [mg/L]	13-Feb-23	16:03	0.000089	0.000973	0.000081	0.00427	0.00606	0.00159
V [mg/L]	13-Feb-23	16:03	0.00003	0.00047	0.00007	0.00005	0.00008	0.00154
W [mg/L]	13-Feb-23	16:03	0.00032	0.00044	0.00009	0.00015	0.00018	0.00019
Y [mg/L]	13-Feb-23	16:03	< 0.00002	0.00007	0.00003	< 0.00002	< 0.00002	0.00016
Zn [mg/L]	13-Feb-23	16:03	< 0.002	< 0.002	0.002	< 0.002	0.002	0.002

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Environment, Health & Safety

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Marathon - Berry Set 2

Project : Berry Project

21-February-2023

Date Rec. : 09 February 2023
LR Report: **CA10068-FEB23**
Reference: Wk#7 - Berry Project

Copy: #1

Marathon Gold Corp
Attn : James Powell

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Phone: 709-730-5046
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#7	6: B SED Wk#7	7: B MD Wk#7	8: B QTP Wk#7	9: B LGO Wk#7	10: B HGO Wk#7
Sample Date & Time			09-Feb-23	09-Feb-23	09-Feb-23	09-Feb-23	09-Feb-23	09-Feb-23
HumCell Leachate Vol [mL]	13-Feb-23	15:36	995	1002	991	990	996	981
pH [No unit]	13-Feb-23	11:40	7.44	7.59	7.47	7.49	7.38	7.56
Conductivity [uS/cm]	13-Feb-23	11:40	30	34	38	26	29	32

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Marathon - Berry Set 1

Project : Berry Project

21-February-2023

Date Rec. : 16 February 2023
LR Report: **CA10112-FEB23**
Reference: Wk#9 - Berry Project

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#9	6: B SED-High SFE Wk#9	7: B QTP-PAG Wk#9	8: B LGO-PAG Wk#9	9: B HGO-PAG-Zn Wk#9
Sample Date & Time							
HumCell Leachate Vol [mL]	21-Feb-23	10:38	539	717	651	619	721
pH [No unit]	17-Feb-23	16:45	7.37	7.68	7.10	7.63	7.33
Conductivity [uS/cm]	17-Feb-23	16:45	28	34	29	53	24

Analysis	10: B OB-ML Wk#9
Sample Date & Time	
HumCell Leachate Vol [mL]	511
pH [No unit]	6.97
Conductivity [uS/cm]	62

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

21-February-2023

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Date Rec. : 13 February 2023
LR Report: **CA10118-FEB23**
Reference: Wk#0 - Berry Project

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-COQ 3DP Wk#0	6: B QTP-PAG-CO3DL P Wk#0	7: B GO-PAG-CO3D P Wk#0	8: B HGO-PAG-Zn-C O3DP Wk#0
Sample Date & Time			13-Feb-23	13-Feb-23	13-Feb-23	13-Feb-23
HumCell Leachate Vol [mL]	15-Feb-23	08:53	520	508	446	517

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Lisa Thompson
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OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

28-February-2023

Marathon Gold Corp
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A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 16 February 2023
LR Report: **CA10113-FEB23**
Reference: Wk#8 - Berry Project

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#8	6: B SED Wk#8	7: B MD Wk#8	8: B QTP Wk#8	9: B LGO Wk#8
Sample Date & Time			16-Feb-23	16-Feb-23	16-Feb-23	16-Feb-23	16-Feb-23
HumCell Leachate Vol [mL]	21-Feb-23	10:38	866	919	850	844	871
pH [No unit]	22-Feb-23	11:22	8.23	8.67	8.22	7.86	8.16
Acidity [mg/L as CaCO3]	22-Feb-23	11:22	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	24-Feb-23	10:05	13	12	14	11	11
Conductivity [uS/cm]	22-Feb-23	11:22	21	26	29	21	21
SO4 [mg/L]	28-Feb-23	13:35	0.9	0.6	1.0	0.5	1.6
F [mg/L]	21-Feb-23	10:54	< 0.06	0.09	< 0.06	< 0.06	< 0.06
Hg [mg/L]	17-Feb-23	16:55	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	28-Feb-23	09:41	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	28-Feb-23	09:41	0.066	0.059	0.091	0.069	0.058
As [mg/L]	28-Feb-23	09:41	0.0005	0.0010	0.0005	0.0003	< 0.0002
Ba [mg/L]	28-Feb-23	09:41	0.00061	0.00672	0.00074	0.00032	0.00037
Be [mg/L]	28-Feb-23	09:41	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	28-Feb-23	09:41	< 0.002	0.008	< 0.002	0.008	0.002
Bi [mg/L]	28-Feb-23	09:41	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	28-Feb-23	09:41	3.96	3.80	5.03	3.60	3.88
Cd [mg/L]	28-Feb-23	09:41	0.000020	0.000006	0.000003	< 0.000003	< 0.000003
Co [mg/L]	28-Feb-23	09:41	< 0.000004	0.000005	< 0.000004	< 0.000004	< 0.000004
Cr [mg/L]	28-Feb-23	09:41	< 0.00008	< 0.00008	< 0.00008	0.00013	< 0.00008
Cu [mg/L]	28-Feb-23	09:41	0.0004	0.0003	0.0003	0.0008	0.0010
Fe [mg/L]	28-Feb-23	09:41	< 0.007	< 0.007	0.008	0.010	< 0.007
K [mg/L]	28-Feb-23	09:41	0.525	0.652	0.465	0.380	0.290
Li [mg/L]	28-Feb-23	09:41	< 0.0001	0.0003	< 0.0001	0.0001	< 0.0001
Mg [mg/L]	28-Feb-23	09:41	0.219	0.381	0.486	0.262	0.209
Mn [mg/L]	28-Feb-23	09:41	0.0218	0.0274	0.0153	0.0222	0.0241
Mo [mg/L]	28-Feb-23	09:41	0.00059	0.00531	0.00066	0.00159	0.00046
Na [mg/L]	28-Feb-23	09:41	0.36	0.39	0.36	0.35	0.43
Ni [mg/L]	28-Feb-23	09:41	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Pb [mg/L]	28-Feb-23	09:41	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009

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Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10113-FEB23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#8	6: B SED Wk#8	7: B MD Wk#8	8: B QTP Wk#8	9: B LGO Wk#8
Sb [mg/L]	28-Feb-23	09:41	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	28-Feb-23	09:41	< 0.00004	0.00041	0.00007	0.00004	0.00004
Sr [mg/L]	28-Feb-23	09:41	0.00506	0.0344	0.0168	0.00918	0.00814
Sn [mg/L]	28-Feb-23	09:41	0.00006	0.00011	< 0.00006	< 0.00006	< 0.00006
Ti [mg/L]	28-Feb-23	09:41	0.00016	0.00005	0.00041	0.00057	0.00029
Tl [mg/L]	28-Feb-23	09:41	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	28-Feb-23	09:41	0.000443	0.000679	0.000122	0.000390	0.000880
V [mg/L]	28-Feb-23	09:41	0.00015	0.00048	0.00920	0.00018	0.00010
W [mg/L]	28-Feb-23	09:41	0.00006	0.00017	0.00010	0.00018	0.00006
Y [mg/L]	28-Feb-23	09:41	< 0.00002	< 0.00002	< 0.00002	0.00002	< 0.00002
Zn [mg/L]	28-Feb-23	09:41	< 0.002	0.003	< 0.002	< 0.002	0.002

Analysis	10: B HGO Wk#8
Sample Date & Time	16-Feb-23
HumCell Leachate Vol [mL]	883
pH [No unit]	7.82
Acidity [mg/L as CaCO3]	< 2
Alkalinity [mg/L as CaCO3]	10
Conductivity [uS/cm]	32
SO4 [mg/L]	4.3
F [mg/L]	< 0.06
Hg [mg/L]	< 0.00001
Ag [mg/L]	< 0.00005
Al [mg/L]	0.056
As [mg/L]	0.0002
Ba [mg/L]	0.00028
Be [mg/L]	< 0.000007
B [mg/L]	0.004
Bi [mg/L]	< 0.00001
Ca [mg/L]	5.43
Cd [mg/L]	< 0.000003
Co [mg/L]	< 0.000004
Cr [mg/L]	< 0.00008
Cu [mg/L]	0.0006
Fe [mg/L]	0.010
K [mg/L]	0.323
Li [mg/L]	< 0.0001
Mg [mg/L]	0.296
Mn [mg/L]	0.0300
Mo [mg/L]	0.00264
Na [mg/L]	0.47
Ni [mg/L]	< 0.0001

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Analysis	10: B HGO Wk#8
Pb [mg/L]	< 0.00009
Sb [mg/L]	< 0.0009
Se [mg/L]	< 0.00004
Sr [mg/L]	0.0109
Sn [mg/L]	0.00008
Ti [mg/L]	0.00048
Tl [mg/L]	< 0.000005
U [mg/L]	0.000347
V [mg/L]	0.00010
W [mg/L]	0.00013
Y [mg/L]	< 0.00002
Zn [mg/L]	0.002

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Marathon - Berry Set 1

Project : Berry Project

01-March-2023

Marathon Gold Corp
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Phone: 709-730-5046
Fax:

Date Rec. : 23 February 2023
LR Report: **CA10163-FEB23**
Reference: Wk#10 - Berry Project

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#10	6: B SED-High SFE Wk#10	7: B QTP-PAG Wk#10	8: B LGO-PAG Wk#10	9: B HGO-PAG-Zn Wk#10	10: B OB-ML Wk#10
Sample Date & Time			23-Feb-23	23-Feb-23	23-Feb-23	23-Feb-23	23-Feb-23	23-Feb-23
HumCell Leachate Vol [mL]	28-Feb-23	10:37	539	702	612	592	632	417
pH [No unit]	24-Feb-23	15:08	7.33	7.61	7.28	7.40	7.31	6.69
Conductivity [uS/cm]	24-Feb-23	15:08	32	38	24	43	25	54

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

01-March-2023

Marathon Gold Corp
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Date Rec. : 21 February 2023
LR Report: **CA10168-FEB23**
Reference: Wk#1 - Berry Project

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#0	6: B QTP-PAG-CO3DLP Wk#0	7: B LGO-PAG-CO3DP Wk#0	8: B HGO-PAG-Zn-CO3DP Wk#0
Sample Date & Time			13-Feb-23	13-Feb-23	13-Feb-23	13-Feb-23
HumCell Leachate Vol [mL]	22-Feb-23	14:02	571	581	509	573

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Marathon - Berry Set 2

Project : Marathon - Berry Set 2

01-March-2023

Marathon Gold Corp
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Date Rec. : 23 February 2023
LR Report: **CA10164-FEB23**
Reference: Wk#9 - Marathon - Berry Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#9	6: B SED Wk#9	7: B MD Wk#9	8: B QTP Wk#9	9: B LGO Wk#9	10: B HGO Wk#9
Sample Date & Time			23-Feb-23	23-Feb-23	23-Feb-23	23-Feb-23	23-Feb-23	23-Feb-23
HumCell Leachate Vol [mL]	28-Feb-23	10:37	903	942	917	917	889	900
pH [No unit]	24-Feb-23	15:08	7.37	7.49	7.74	7.35	7.23	7.37
Conductivity [uS/cm]	24-Feb-23	15:08	22	29	38	24	22	27

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Marathon - Berry Set 1

Project : Berry Project

06-March-2023

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Date Rec. : 02 March 2023
LR Report: **CA10021-MAR23**
Reference: Wk#11 - Marathon - Berry Set 1

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#11	6: B SED-High SFE Wk#11	7: B QTP-PAG Wk#11	8: B LGO-PAG Wk#11	9: B HGO-PAG-Zn Wk#11	10: B OB-ML Wk#11
Sample Date & Time			02-Mar-23	02-Mar-23	02-Mar-23	02-Mar-23	02-Mar-23	02-Mar-23
HumCell Leachate Vol [mL]	06-Mar-23	10:34	541	689	658	585	686	501
pH [No unit]	03-Mar-23	13:30	7.29	7.54	7.30	7.24	7.23	7.06
Conductivity [uS/cm]	03-Mar-23	13:30	26	33	24	34	19	75

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Lisa Thompson
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OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

06-March-2023

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Date Rec. : 02 March 2023
LR Report: **CA10022-MAR23**
Reference: Wk#10 - Marathon - Berry Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#10	6: B SED Wk#10	7: B MD Wk#10	8: B QTP Wk#10	9: B LGO Wk#10	10: B HGO Wk#10
Sample Date & Time			02-Mar-23	02-Mar-23	02-Mar-23	02-Mar-23	02-Mar-23	02-Mar-23
HumCell Leachate Vol [mL]	06-Mar-23	10:34	900	950	942	941	935	939
pH [No unit]	03-Mar-23	13:31	7.38	7.60	7.57	7.36	7.24	7.40
Conductivity [uS/cm]	03-Mar-23	13:31	22	26	28	19	17	24

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003252874

TEST REPORT
Sub-Aqueous Column

Sample Properties

BL1021-43 Detox Tls (g)	3000
Process Water Cover (mL)	2390
Initital Tailings Height in Column (cm	27.6

Analysis of Column Leachate

Parameter	Units	CCME FAL / MDMER	0	1	2	4	6	8
Date			25-Nov-22	01-Dec-22	08-Dec-22	22-Dec-22	05-Jan-23	19-Jan-23
LIMS			14520-NOV22	14059-DEC22	14281-DEC22	14616-DEC22	n/a	14495-JAN23
Volume Collected	mL	-	500	450	450	450	450	450
Temp Upon Receipt	°C	-	20.0	21.0	20.0	20.0	-	20.0
pH	no unit	6.0-9.5	7.78	7.86	7.87	8.01	-	7.72
Alkalinity	mg/L as $CaCO_3$	-	53	65	78	104	-	132
Conductivity	µS/cm	-	1840	1890	1870	1950	-	1880
Redox Potential	mV	-	164	329	333	286	-	145
TDS	mg/L	-	1260	1160	1320	1310	-	1420
F	mg/L	0.12	**0.14**	0.10	0.08	0.07	-	0.08
NO_2	as N mg/L	0.06	< 0.3	< 0.3	< 0.3	< 0.3	-	< 0.3
NO_3	as N mg/L	13	0.95	< 0.6	< 0.6	< 0.6	-	< 0.6
NO_2+NO_3	as N mg/L	-	0.95	< 0.6	< 0.06	< 0.6	-	<0.6
Cl	mg/L	120	12	9.7	7.4	7.8	-	7.6
SO_4	mg/L	-	710	760	800	910	-	860
$CN_{(T)}$	mg/L	0.50	**0.79**	**1.90**	**2.66**	**2.74**	-	**31.3**
CN_{WAD}	mg/L	0.005 as CNF	**0.774**	**1.51**	**2.25**	**2.29**	-	**0.405**
CNS	mg/L	-	< 2	5.7	5.6	4.0	-	< 2
CNO	mg/L	-	62	14 UAL	1.5	< 1	-	< 1
NH_3+NH_4	as N mg/L	-	3.6	5.8	7.3	7.2	-	1.2
Un-ionized NH_3 (calc'd)	as N mg/L	0.02 / 0.50	**0.08**	**0.16**	**0.21**	**0.28**	-	**0.02**
S_2O_3	as S_2O_3 mg/L	-	< 20	< 20	< 20	< 20	-	< 10
Hg	mg/L	).000026 / 0.000	**0.00004**	**0.00024**	**0.00003**	< 0.00001	-	**0.00028**
Ag	mg/L	0.00025	**0.00029**	**0.00234**	**0.00083**	**0.00031**	-	< 0.00005
Al	mg/L	0.1@pH>6.5	0.035	0.029	0.021	0.018	-	0.014
As	mg/L	0.005 / 0.10	0.0003	0.0005	0.0004	0.0006	-	0.0010
B	mg/L	1.5	0.039	0.042	0.097	0.053	-	0.062
Ba	mg/L	-	0.00789	0.00932	0.01056	0.00914	-	0.00621
Be	mg/L		< 0.000007	< 0.000007	< 0.000007	< 0.000007	-	< 0.000007
Bi	mg/L	-	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-	0.00001
Ca	mg/L	-	100	95.5	87.6	102	-	167
Cd	mg/L	0.00009	0.000021	0.000024	0.000022	0.000032	-	0.000059
Co	mg/L	-	0.00479	0.00247	0.00389	0.0102	-	0.0250
Cr	mg/L	-	0.00011	< 0.00008	0.00016	< 0.00008	-	0.0148
Cu	mg/L	0.002 / 0.10	**0.743**	**1.63**	**2.70**	**2.45**	-	**0.309**
Fe	mg/L	0.3	0.030	< 0.007	< 0.007	0.036	-	**13.2**
K	mg/L	-	7.09	11.9	10.2	10.7	-	3.64
Li	mg/L	-	0.0037	0.0038	0.0018	0.0012	-	0.0014
Mg	mg/L	-	4.81	7.20	6.73	8.10	-	13.5
Mn	mg/L	-	0.103	0.0543	0.0848	0.0959	-	0.145
Mo	mg/L	0.073	0.0163	0.0342	0.0377	0.0382	-	0.0325
Na	mg/L	-	256	299	287	316	-	263
Ni	mg/L	0.025 / 0.25	0.0123	0.0012	0.0019	0.0041	-	0.0049
P	mg/L	-	0.013	0.007	0.006	0.004	-	0.010
Pb	mg/L	0.001 / 0.08	**0.00103**	< 0.00009	< 0.00009	< 0.00009	-	0.00011
S	mg/L	-	292	302	293	312	-	306
Sb	mg/L	-	0.0013	0.0012	0.0013	0.0013	-	0.0013
Se	mg/L	0.001 / 0.01	**0.00131**	0.00060	0.00036	0.00029	-	**0.00115**
Si	mg/L	-	1.25	2.36	2.23	2.45	-	4.62
Sn	mg/L	-	0.00389	0.00023	0.00025	0.00016	-	0.00056
Sr	mg/L	-	0.351	0.361	0.347	0.367	-	0.574
Th	mg/L	-	< 0.0001	< 0.0001	0.0008	< 0.0001	-	< 0.0001
Ti	mg/L	-	< 0.00005	< 0.00005	< 0.00005	0.00010	-	0.00011
Tl	mg/L	0.0008	< 0.000005	0.000007	0.000019	0.000008	-	< 0.000005
U	mg/L	0.015	0.000524	0.000253	0.000379	0.000868	-	0.000780
V	mg/L	-	0.00002	0.00003	0.00004	0.00003	-	0.00006
W	mg/L	-	0.00009	0.00010	0.00010	0.00006	-	0.00033
Y	mg/L	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	-	< 0.00002
Zn	mg/L	0.007 / 0.40	< 0.002	**0.009**	**0.015**	**0.011**	-	0.002

Parameters outside the CCME FAL guidelines are indicated in bold type.
Parameters outside the MDMER limits are indicated in bold blue type.

Raised RL's for CNS, Nitrates + S_2O_3 due to sample matrix
UAL=CNO process past holding time

TEST REPORT
Sub-Aqueous Column

Sample Properties

BL1021-43 Detox Tls (g)	3000
Process Water Cover (mL)	2390
Initital Tailings Height in Column (cn	27.6

Analysis of Column Leachate

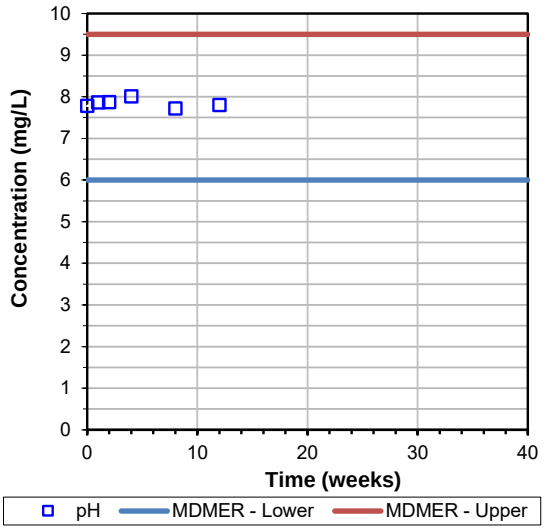
Parameter	Units	CCME FAL / MDMER	10	12	14	16	18	20
Date			02-Feb-23	16-Feb-23	02-Mar-23	16-Mar-23	30-Mar-23	13-Apr-23
LIMS			n/a	14400-FEB23	n/a		n/a	
Volume Collected	mL	-	400	450	450			
Temp Upon Receipt	°C	-	-	20.0	-		-	
pH	no unit	6.0-9.5	-	7.80	-		-	
Alkalinity	mg/L as $CaCO_3$	-	-	53	-		-	
Conductivity	µS/cm	-	-	1590	-		-	
Redox Potential	mV	-	-	122	-		-	
TDS	mg/L	-	-	1250	-		-	
F	mg/L	0.12	-	0.10	-		-	
NO_2	as N mg/L	0.06	-	< 0.3	-		-	
NO_3	as N mg/L	13	-	< 0.6	-		-	
NO_2+NO_3	as N mg/L	-	-	< 0.6	-		-	
Cl	mg/L	120	-	8.3	-		-	
SO_4	mg/L	-	-	790	-		-	
$CN_{(T)}$	mg/L	0.50	-	**16.7**	-		-	
CN_{WAD}	mg/L	0.005 as CNF	-	**0.19**	-		-	
CNS	mg/L	-	-	< 2	-		-	
CNO	mg/L	-	-	< 1	-		-	
NH_3+NH_4	as N mg/L	-	-	0.5	-		-	
Un-ionized NH_3 (calc'd)	as N mg/L	0.02 / 0.50	-	0.01	-			
S_2O_3	as S_2O_3 mg/L	-	-	< 2	-		-	
Hg	mg/L	0.000026 / 0.000	-	**0.00005**	-		-	
Ag	mg/L	0.00025	-	< 0.0005	-		-	
Al	mg/L	0.1@pH>6.5	-	0.03	-		-	
As	mg/L	0.005 / 0.10	-	**0.012**	-		-	
B	mg/L	1.5	-	0.04	-		-	
Ba	mg/L	-	-	0.0172	-		-	
Be	mg/L		-	0.00023	-		-	
Bi	mg/L	-	-	< 0.0001	-		-	
Ca	mg/L	-	-	135	-		-	
Cd	mg/L	0.00009	-	**0.00053**	-		-	
Co	mg/L	-	-	0.0156	-		-	
Cr	mg/L	-	-	0.0022	-		-	
Cu	mg/L	0.002 / 0.10	-	**0.045**	-		-	
Fe	mg/L	0.3	-	**8.23**	-		-	
K	mg/L	-	-	1.85	-		-	
Li	mg/L	-	-	< 0.001	-		-	
Mg	mg/L	-	-	10.4	-		-	
Mn	mg/L	-	-	0.225	-		-	
Mo	mg/L	0.073	-	0.0416	-		-	
Na	mg/L	-	-	201	-		-	
Ni	mg/L	0.025 / 0.25	-	0.002	-		-	
P	mg/L	-	-	0.12	-		-	
Pb	mg/L	0.001 / 0.08	-	< 0.0009	-		-	
S	mg/L	-	-	317	-		-	
Sb	mg/L	-	-	< 0.009	-		-	
Se	mg/L	0.001 / 0.01	-	**0.0111**	-		-	
Si	mg/L	-	-	2.2	-		-	
Sn	mg/L	-	-	0.0019	-		-	
Sr	mg/L	-	-	0.496	-		-	
Th	mg/L	-	-	0.002	-		-	
Ti	mg/L	-	-	0.0080	-		-	
Tl	mg/L	0.0008	-	< 0.00005	-		-	
U	mg/L	0.015	-	0.00019	-		-	
V	mg/L	-	-	0.0003	-		-	
W	mg/L	-	-	< 0.0002	-		-	
Y	mg/L	-	-	< 0.0002	-		-	
Zn	mg/L	0.007 / 0.40	-	< 0.02	-		-	

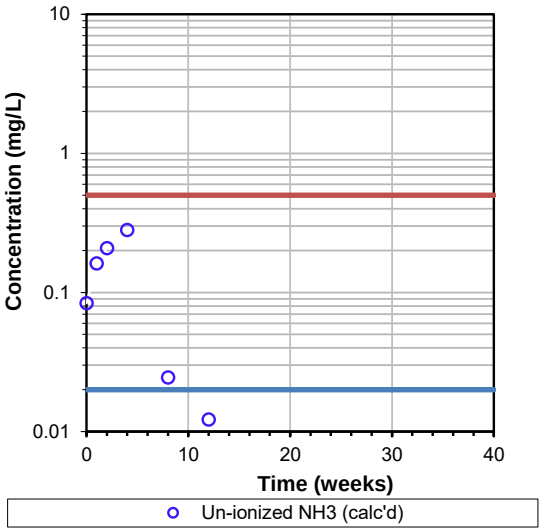
Parameters outside the CCME FAL guidelines are indicated in b
Parameters outside the MDMER limits are indicated in bold blue

RL raised 10 x for metals due to samlpe matrix interference
Column top-ups with Li spiked DI water (5 mg/L) starting after Week 10 sampling

TEST REPORT
Sub-Aqueous Column

Selected Parameters - BL1021-43 Detox Tls (g)





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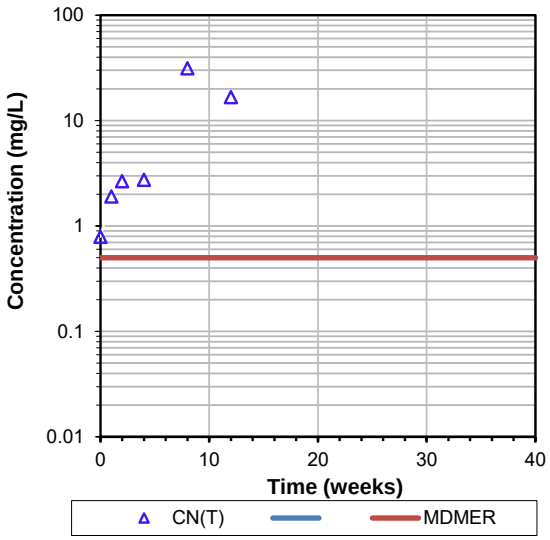
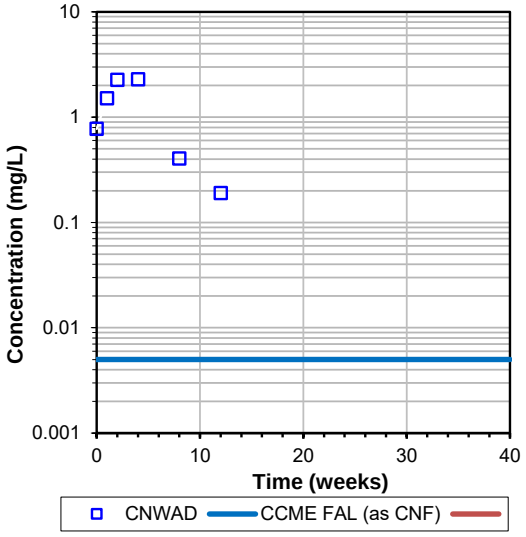
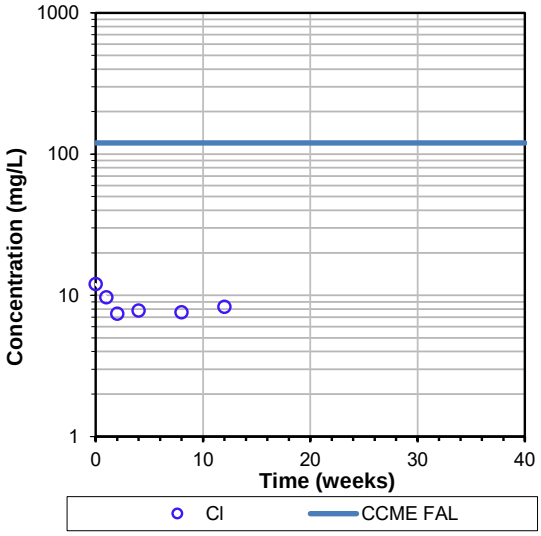
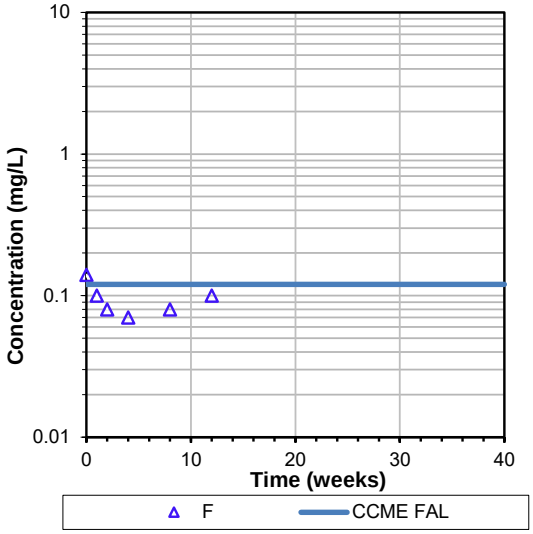




TEST REPORT
Sub-Aqueous Column

Selected Parameters - BL1021-43 Detox Tls (g)





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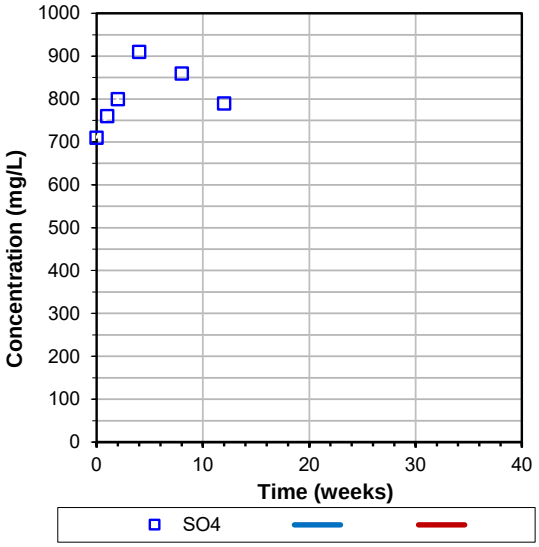
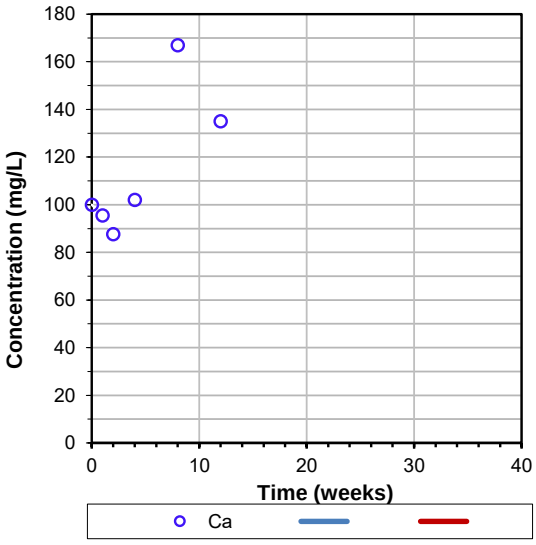
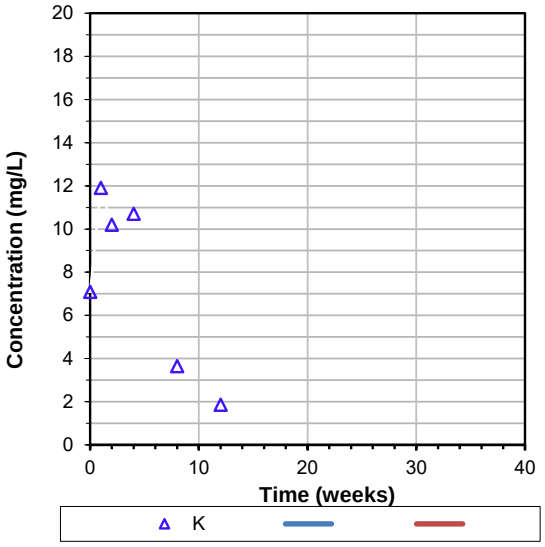
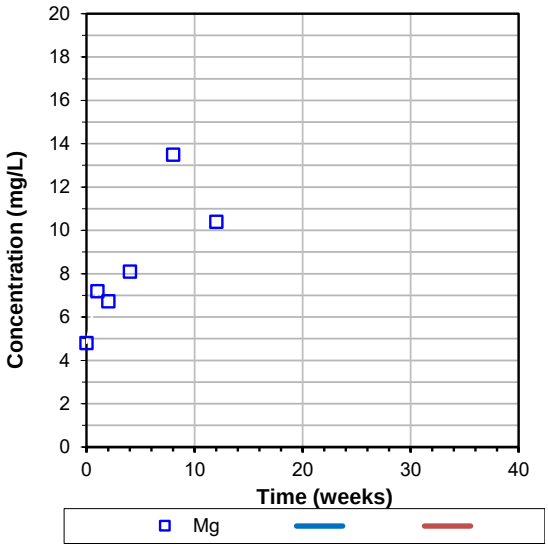




TEST REPORT
Sub-Aqueous Column

Selected Parameters - BL1021-43 Detox Tls (g)





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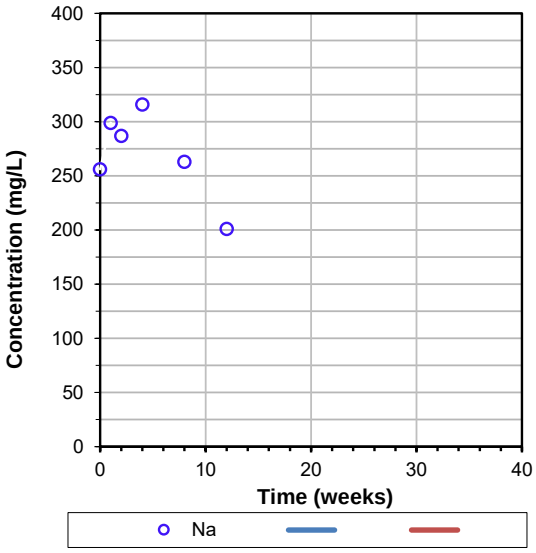
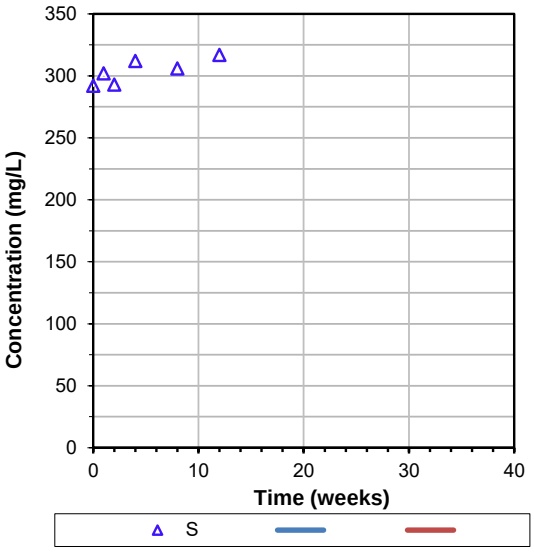
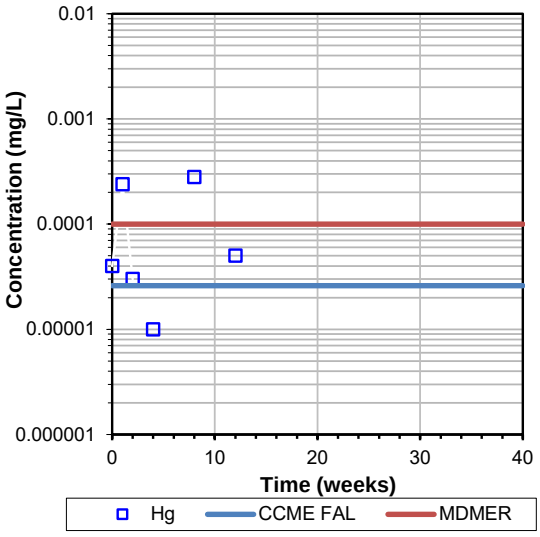
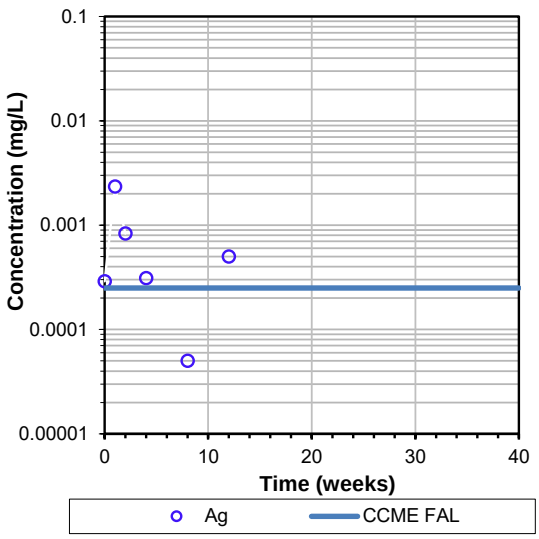




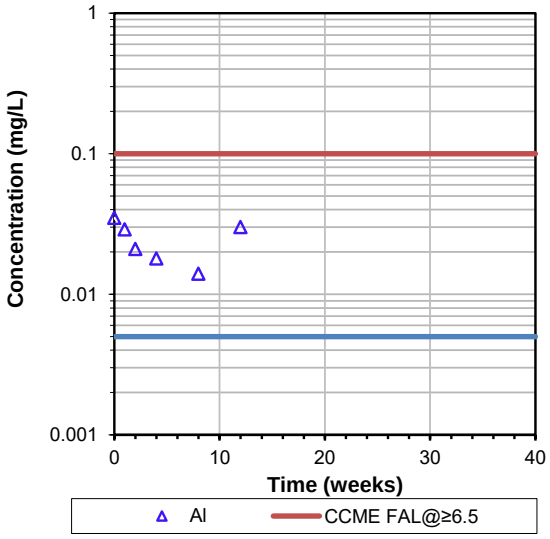
TEST REPORT
Sub-Aqueous Column

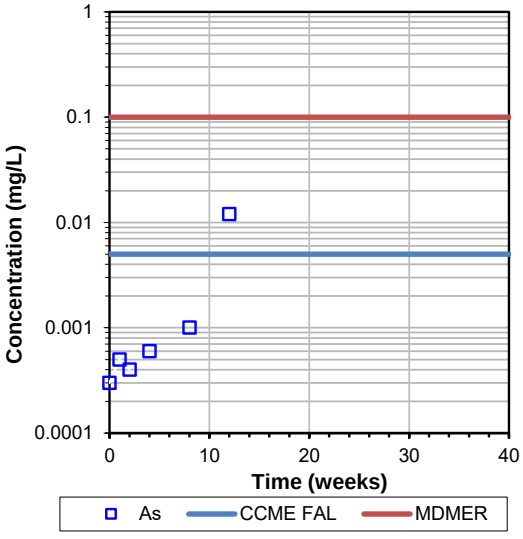
Selected Parameters - BL1021-43 Detox Tls (g)





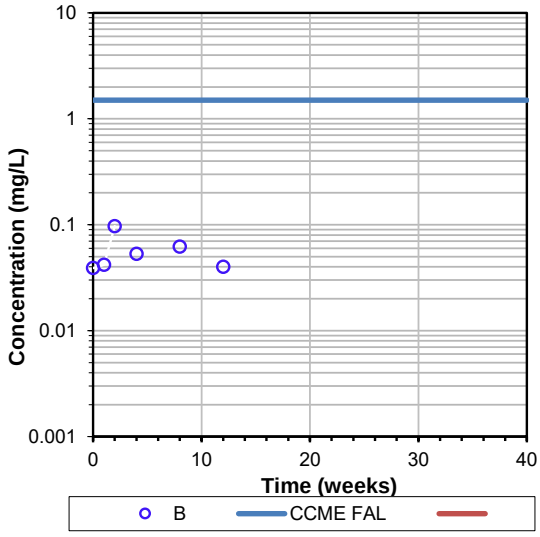
Selected Parameters - BL1021-43 Detox Tls (g)

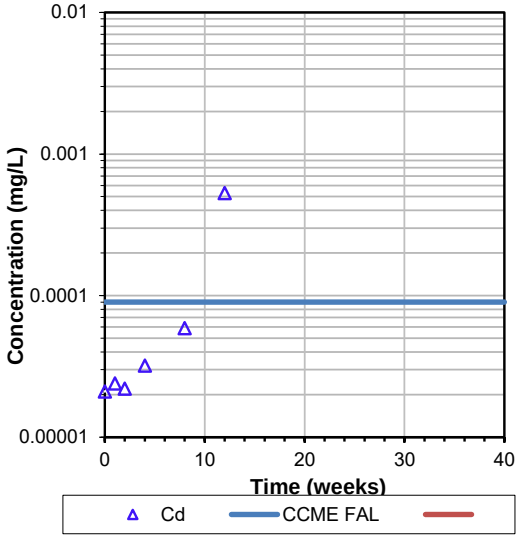




TEST REPORT
Sub-Aqueous Column

Selected Parameters - BL1021-43 Detox Tls (g)





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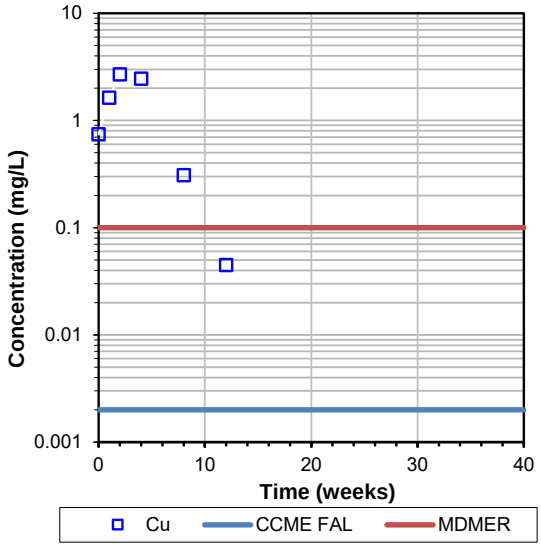
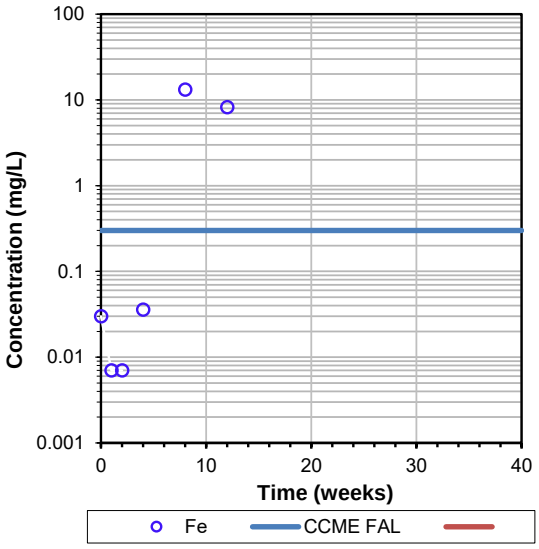
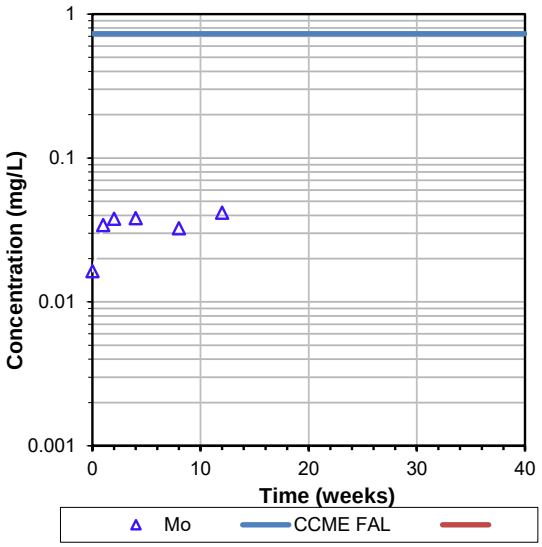
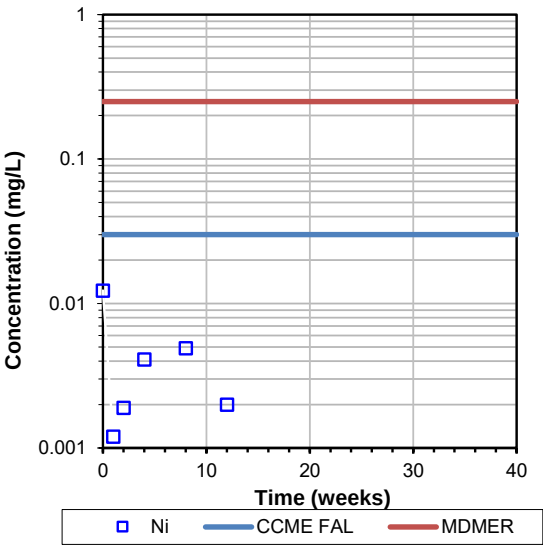




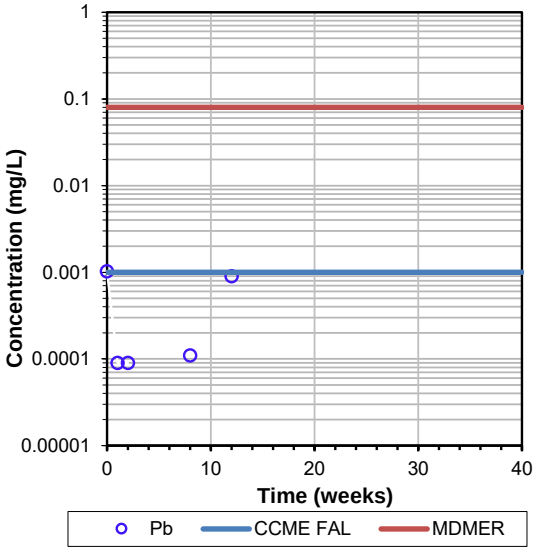
TEST REPORT
Sub-Aqueous Column

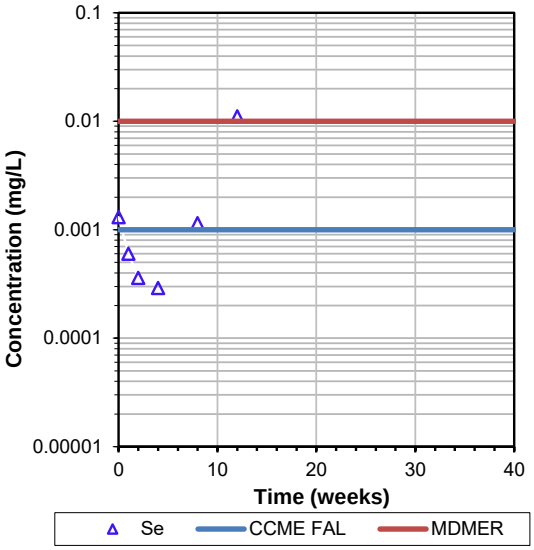
Selected Parameters - BL1021-43 Detox Tls (g)





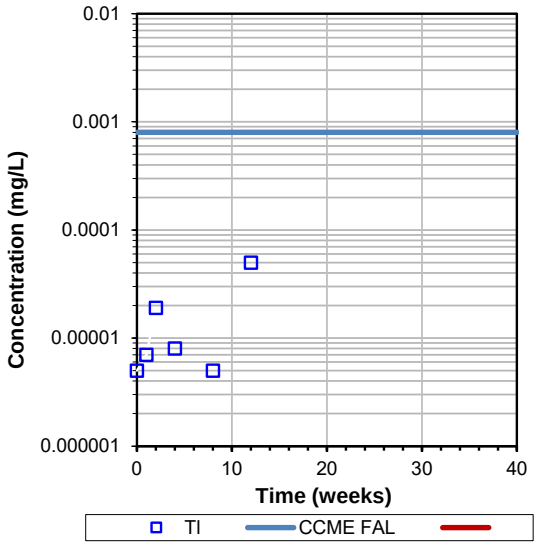
Selected Parameters - BL1021-43 Detox Tls (g)

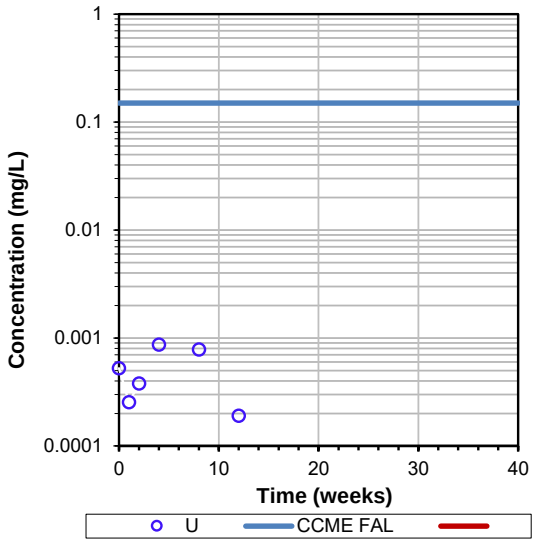




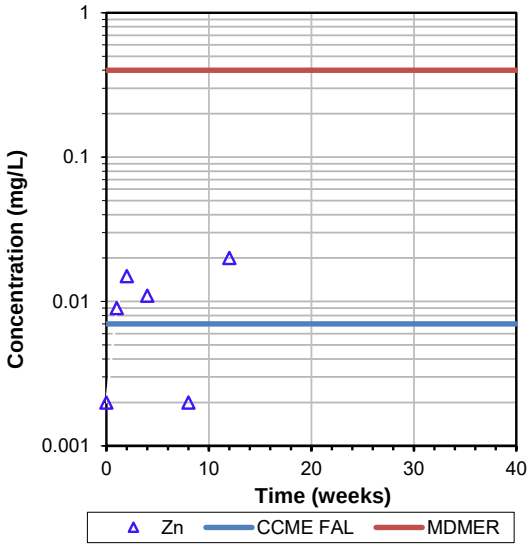
TEST REPORT
Sub-Aqueous Column

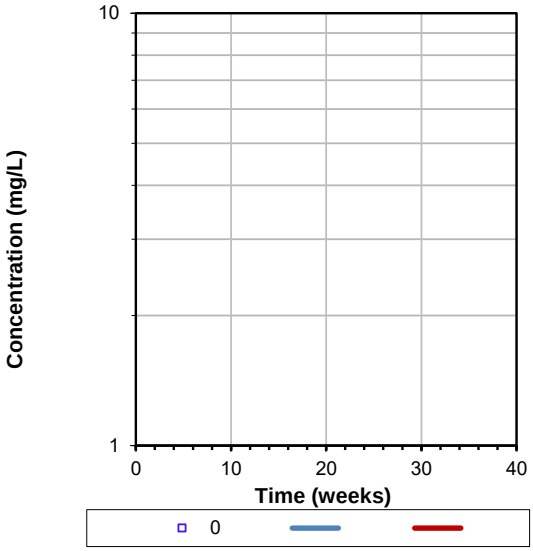
Selected Parameters - BL1021-43 Detox Tls (g)





Selected Parameters - BL1021-43 Detox Tls (g)





SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Marathon - Berry Set 1 NP Depleted Hum Cells

10-March-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 28 February 2023
LR Report: **CA10189-FEB23**
Reference: Wk#2 - Marathon - Berry Set 1 NP Depleted Hum Cells

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#2	6: B QTP-PAG-CO3DLP Wk#2	7: B LGO-PAG-CO3DP Wk#2	8: B HGO-PAG-Zn-CO3DP Wk#2
Sample Date & Time			28-Feb-23	28-Feb-23	28-Feb-23	28-Feb-23
HumCell Leachate Vol [mL]	02-Mar-23	16:14	588	586	503	579
pH [No unit]	01-Mar-23	11:56	5.03	5.17	4.64	5.20
Acidity [mg/L as CaCO3]	01-Mar-23	11:56	5	5	18	5
Alkalinity [mg/L as CaCO3]	01-Mar-23	11:56	< 2	< 2	< 2	< 2
Conductivity [uS/cm]	01-Mar-23	11:56	27	17	56	14
SO4 [mg/L]	09-Mar-23	16:08	9.6	6.0	22	4.6
F [mg/L]	01-Mar-23	09:08	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	06-Mar-23	12:58	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	08-Mar-23	15:17	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	08-Mar-23	15:17	0.006	0.004	0.036	0.002
As [mg/L]	08-Mar-23	15:17	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Ba [mg/L]	08-Mar-23	15:17	0.00068	< 0.00008	0.00028	0.00011
Be [mg/L]	08-Mar-23	15:17	0.000012	0.000031	0.000032	0.000013
B [mg/L]	08-Mar-23	15:17	< 0.002	< 0.002	< 0.002	0.005
Bi [mg/L]	08-Mar-23	15:17	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	08-Mar-23	15:17	1.89	1.04	5.59	0.76
Cd [mg/L]	08-Mar-23	15:17	0.000073	0.000042	0.000070	0.000036
Co [mg/L]	08-Mar-23	15:17	0.00157	0.000365	0.00324	0.000370
Cr [mg/L]	08-Mar-23	15:17	0.00013	0.00020	0.00016	0.00015
Cu [mg/L]	08-Mar-23	15:17	0.0030	0.0050	0.0372	0.0029
Fe [mg/L]	08-Mar-23	15:17	0.031	0.026	0.196	0.014
K [mg/L]	08-Mar-23	15:17	0.084	0.045	0.071	0.042
Li [mg/L]	08-Mar-23	15:17	0.0003	0.0004	0.0006	0.0003
Mg [mg/L]	08-Mar-23	15:17	0.104	0.093	0.216	0.057
Mn [mg/L]	08-Mar-23	15:17	0.0283	0.0796	0.0593	0.0126
Mo [mg/L]	08-Mar-23	15:17	0.00014	< 0.00004	< 0.00004	0.00006
Na [mg/L]	08-Mar-23	15:17	1.61	1.08	1.19	0.90
Ni [mg/L]	08-Mar-23	15:17	0.0022	0.0030	0.0073	0.0012
Pb [mg/L]	08-Mar-23	15:17	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	08-Mar-23	15:17	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	08-Mar-23	15:17	0.00059	0.00076	0.00070	0.00060

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Marathon - Berry Set 1 NP Depleted Hum Cells

LR Report : CA10189-FEB23

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#2	6: B QTP-PAG-CO3DLP Wk#2	7: B LGO-PAG-CO3DP Wk#2	8: B HGO-PAG-Zn-CO3DP Wk#2
Sr [mg/L]	08-Mar-23	15:17	0.00190	0.00064	0.00315	0.00058
Sn [mg/L]	08-Mar-23	15:17	0.00017	0.00011	0.00082	0.00010
Ti [mg/L]	08-Mar-23	15:17	0.00054	0.00051	0.00064	0.00052
Tl [mg/L]	08-Mar-23	15:17	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	08-Mar-23	15:17	0.00300	0.000052	0.000052	0.000089
V [mg/L]	08-Mar-23	15:17	0.00002	0.00002	0.00002	0.00003
W [mg/L]	08-Mar-23	15:17	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Y [mg/L]	08-Mar-23	15:17	< 0.00002	< 0.00002	0.00011	< 0.00002
Zn [mg/L]	08-Mar-23	15:17	0.026	0.019	0.028	0.015

<original signed by>

Lisa Thompson
Project Specialist Assistant,
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0003259395

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

10-March-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 07 March 2023
LR Report: **CA10046-MAR23**
Reference: Wk#3 - Marathon - Berry Set 1 NP Depleted Hum Cells

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CQ O3DP Wk#3	6: B TP-PAG-CO 3DP Wk#3	7: B LGO-PAG-C O3DP Wk#3	8: B HGO-PAG-Zn-CO3DP Wk#3
Sample Date & Time			7-Mar-23	7-Mar-23	7-Mar-23	7-Mar-23
HumCell Leachate Vol [mL]	07-Mar-23	15:06	655	640	591	658
pH [No unit]	09-Mar-23	09:40	5.44	5.12	4.90	5.26
Conductivity [uS/cm]	08-Mar-23	10:15	36	10	31	6

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Lisa Thompson
Project Specialist Assistant,
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Marathon - Berry Set 1

Project : Berry Project

27-March-2023

Marathon Gold Corp
Attn : James Powell

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A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 09 March 2023
LR Report: **CA10067-MAR23**
Reference: Wk#12 - Marathon - Berry Set 1

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#12	6: B SED-High SFE Wk#12	7: B QTP-PAG Wk#12	8: B LGO-PAG Wk#12	9: B HGO-PAG-Zn Wk#12	10: B OB-ML Wk#12
Sample Date & Time			09-Mar-23	09-Mar-23	09-Mar-23	09-Mar-23	09-Mar-23	09-Mar-23
HumCell Leachate Vol [mL]	10-Mar-23	10:53	578	696	648	636	722	513
pH [No unit]	13-Mar-23	10:34	7.19	7.58	7.40	7.38	7.15	6.83
Acidity [mg/L as CaCO3]	13-Mar-23	10:34	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	13-Mar-23	10:35	7	21	7	7	7	5
Conductivity [uS/cm]	15-Mar-23	10:20	21	36	22	34	14	33
SO4 [mg/L]	21-Mar-23	12:08	2.7	1.3	1.5	5.3	1.1	7.8
F [mg/L]	10-Mar-23	13:50	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	13-Mar-23	09:19	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	17-Mar-23	16:18	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	17-Mar-23	16:18	0.045	0.055	0.027	0.026	0.030	0.081
As [mg/L]	17-Mar-23	16:18	0.0003	0.0005	0.0005	0.0003	0.0003	0.0021
Ba [mg/L]	17-Mar-23	16:18	0.00021	0.00176	0.00047	0.00022	0.00024	0.00322
Be [mg/L]	17-Mar-23	16:18	0.000028	0.000022	0.000023	0.000026	0.000016	0.000025
B [mg/L]	17-Mar-23	16:18	0.006	0.003	0.002	0.004	< 0.002	< 0.002
Bi [mg/L]	17-Mar-23	16:18	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	< 0.00001
Ca [mg/L]	17-Mar-23	16:18	3.97	5.50	3.27	4.80	2.83	4.81
Cd [mg/L]	17-Mar-23	16:18	0.000069	0.000090	0.000080	0.000078	0.000069	0.000084
Co [mg/L]	17-Mar-23	16:18	< 0.000004	< 0.000004	< 0.000004	0.000020	0.000017	0.000112
Cr [mg/L]	17-Mar-23	16:18	0.00020	0.00020	0.00026	0.00033	0.00028	0.00051
Cu [mg/L]	17-Mar-23	16:18	0.0004	< 0.0002	< 0.0002	0.0003	< 0.0002	0.0022
Fe [mg/L]	17-Mar-23	16:18	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	0.090
K [mg/L]	17-Mar-23	16:18	0.174	1.10	0.181	0.109	0.120	0.210
Li [mg/L]	17-Mar-23	16:18	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mg [mg/L]	17-Mar-23	16:18	0.174	0.526	0.131	0.126	0.108	0.208
Mn [mg/L]	17-Mar-23	16:18	0.0247	0.0446	0.0264	0.0279	0.0296	0.0185
Mo [mg/L]	17-Mar-23	16:18	0.00070	0.00680	0.00047	0.00094	0.00235	0.00174
Na [mg/L]	17-Mar-23	16:18	0.23	0.25	0.16	0.15	0.14	0.11
Ni [mg/L]	17-Mar-23	16:18	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0001	0.0003
Pb [mg/L]	17-Mar-23	16:18	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	0.00013
Sb [mg/L]	17-Mar-23	16:18	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	17-Mar-23	16:18	0.00083	0.00104	0.00094	0.00097	0.00096	0.00091
Sr [mg/L]	17-Mar-23	16:18	0.00312	0.0440	0.00629	0.00535	0.00646	0.00915

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10067-MAR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#12	6: B SED-High SFE Wk#12	7: B QTP-PAG Wk#12	8: B LGO-PAG Wk#12	9: B HGO-PAG-Zn Wk#12	10: B OB-ML Wk#12
Sn [mg/L]	17-Mar-23	16:18	0.00019	0.00029	0.00108	0.00008	0.00012	0.00048
Ti [mg/L]	17-Mar-23	16:18	0.00088	0.00093	0.00085	0.00100	0.00076	0.00452
Tl [mg/L]	17-Mar-23	16:18	< 0.000005	0.000005	< 0.000005	< 0.000005	0.000025	< 0.000005
U [mg/L]	17-Mar-23	16:18	0.00242	0.000597	0.000159	0.00681	0.00305	0.000110
V [mg/L]	17-Mar-23	16:18	0.00013	0.00062	0.00010	0.00008	0.00009	0.00162
W [mg/L]	17-Mar-23	16:18	0.00009	0.00015	0.00005	0.00007	0.00014	0.00011
Y [mg/L]	17-Mar-23	16:18	0.00003	0.00006	0.00004	0.00003	0.00002	0.00012
Zn [mg/L]	17-Mar-23	16:18	0.004	< 0.002	0.002	< 0.002	0.003	0.002

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Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

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Marathon - Berry Set 2

Project : Berry Project

27-March-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO, Mt. Pearl
Canada, A1N 0A1
Phone: 709-730-5046, Fax:

Date Rec. : 09 March 2023
LR Report: **CA10068-MAR23**
Reference: Wk#11

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#11	6: B SED Wk#11	7: B MD Wk#11	8: B QTP Wk#11	9: B LGO Wk#11	10: B HGO Wk#11
Sample Date & Time			09-Mar-23	09-Mar-23	09-Mar-23	09-Mar-23	09-Mar-23	09-Mar-23
HumCell Leachate Vol [mL]	10-Mar-23	10:53	907	938	917	924	916	927
pH [No unit]	13-Mar-23	14:44	7.30	7.48	7.51	7.40	7.12	7.32
Conductivity [uS/cm]	13-Mar-23	14:44	20	24	29	21	18	25

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Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

27-March-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
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Phone: 709-730-5046
Fax:

Date Rec. : 14 March 2023
LR Report: **CA10093-MAR23**
Reference: Wk#4 - Berry Project

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#4	6: B QTP-PAG-CO3DLP Wk#4	7: B QGO-PAG-CO3DP Wk#4	8: B HGO-PAG-Zn-CO3DP Wk#4
Sample Date & Time			14-Mar-23	14-Mar-23	14-Mar-23	14-Mar-23
HumCell Leachate Vol [mL]	15-Mar-23	08:14	642	648	584	647
pH [No unit]	15-Mar-23	11:00	5.23	5.40	5.09	5.98
Acidity [mg/L as CaCO3]	15-Mar-23	11:00	4	5	7	3
Alkalinity [mg/L as CaCO3]	15-Mar-23	11:00	< 2	< 2	< 2	< 2
Conductivity [uS/cm]	15-Mar-23	11:00	24	10	27	8
SO4 [mg/L]	21-Mar-23	13:29	10	3.8	16	2.2
F [mg/L]	15-Mar-23	13:28	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	16-Mar-23	16:00	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	24-Mar-23	11:52	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	24-Mar-23	11:52	0.022	0.003	0.036	0.005
As [mg/L]	24-Mar-23	11:52	< 0.0002	< 0.0002	0.0008	< 0.0002
Ba [mg/L]	24-Mar-23	11:52	0.00055	0.00011	0.00048	0.00026
Be [mg/L]	24-Mar-23	11:52	0.000027	0.000009	0.000019	< 0.000007
B [mg/L]	24-Mar-23	11:52	0.002	< 0.002	< 0.002	0.002
Bi [mg/L]	24-Mar-23	11:52	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	24-Mar-23	11:52	2.36	0.90	3.13	0.61
Cd [mg/L]	24-Mar-23	11:52	0.000082	0.000009	0.000011	0.000004
Co [mg/L]	24-Mar-23	11:52	0.00457	0.000314	0.00214	0.000251
Cr [mg/L]	24-Mar-23	11:52	0.00350	0.00204	0.00169	0.00233
Cu [mg/L]	24-Mar-23	11:52	0.0090	0.0039	0.0312	0.0019
Fe [mg/L]	24-Mar-23	11:52	0.883	0.782	0.778	0.443
K [mg/L]	24-Mar-23	11:52	0.105	0.047	0.056	0.045
Li [mg/L]	24-Mar-23	11:52	0.0003	0.0002	0.0003	0.0001
Mg [mg/L]	24-Mar-23	11:52	0.206	0.066	0.126	0.037
Mn [mg/L]	24-Mar-23	11:52	0.0667	0.0730	0.0348	0.0110
Mo [mg/L]	24-Mar-23	11:52	0.00101	0.00050	0.00045	0.00055
Na [mg/L]	24-Mar-23	11:52	0.87	0.42	0.45	0.31
Ni [mg/L]	24-Mar-23	11:52	0.0041	0.0066	0.0033	0.0022
Pb [mg/L]	24-Mar-23	11:52	< 0.00009	0.00013	< 0.00009	< 0.00009
Sb [mg/L]	24-Mar-23	11:52	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	24-Mar-23	11:52	0.00013	0.00005	0.00005	< 0.00004
Sr [mg/L]	24-Mar-23	11:52	0.00214	0.00053	0.00247	0.00045
Sn [mg/L]	24-Mar-23	11:52	0.00017	0.00009	0.00050	0.00011

OnLine LIMS

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

LR Report : **CA10093-MAR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#4	6: B QTP-PAG-CO3DLP Wk#4	7: B LGO-PAG-CO3DP Wk#4	8: B HGO-PAG-Zn-CO3DP Wk#4
Ti [mg/L]	24-Mar-23	11:52	0.00007	0.00011	0.00015	0.00008
Tl [mg/L]	24-Mar-23	11:52	0.000012	0.000011	0.000019	0.000018
U [mg/L]	24-Mar-23	11:52	0.00183	0.000231	0.000254	0.000028
V [mg/L]	24-Mar-23	11:52	0.00005	0.00004	0.00004	0.00005
W [mg/L]	24-Mar-23	11:52	< 0.00002	< 0.00002	< 0.00002	0.00004
Y [mg/L]	24-Mar-23	11:52	0.00009	< 0.00002	0.00018	< 0.00002
Zn [mg/L]	24-Mar-23	11:52	0.019	0.013	0.012	0.016

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

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Marathon - Berry Set 1

Project : Berry Project

27-March-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO, Mt. Pearl
Canada, A1N 0A1
Phone: 709-730-5046, Fax:

Date Rec. : 16 March 2023
LR Report: **CA10114-MAR23**
Reference: Wk#13 - Marathon - Berry Set 1

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#13	6: B SED-High SFE Wk#13	7: B QTP-PAG Wk#13	8: B LGO-PAG Wk#13	9: B HGO-PAG-Zn Wk#13	10: B OB-ML Wk#13
Sample Date & Time			16-Mar-23	16-Mar-23	16-Mar-23	16-Mar-23	16-Mar-23	16-Mar-23
HumCell Leachate Vol [mL]	20-Mar-23	12:28	547	659	657	649	716	506
pH [No unit]	21-Mar-23	10:22	7.27	7.42	7.38	7.29	7.16	7.00
Conductivity [uS/cm]	17-Mar-23	12:44	26	26	22	31	18	40

<original signed by>

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Project Specialist Assistant,
Environment, Health & Safety

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Marathon - Berry Set 1

Project : Berry Project

30-March-2023

Marathon Gold Corp
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Phone: 709-730-5046
Fax:

Date Rec. : 23 March 2023
LR Report: **CA10162-MAR23**
Reference: Wk#14 - Marathon - Berry Set 1

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#14	6: B SED-High SFE Wk#14	7: B QTP-PAG Wk#14	8: B LGO-PAG Wk#14	9: B HGO-PAG-Zn Wk#14	10: B OB-ML Wk#14
Sample Date & Time			23-Mar-23	23-Mar-23	23-Mar-23	23-Mar-23	23-Mar-23	23-Mar-23
HumCell Leachate Vol [mL]	29-Mar-23	13:31	592	672	666	655	706	538
pH [No unit]	27-Mar-23	12:39	7.38	7.56	7.39	7.27	7.59	7.03
Conductivity [uS/cm]	24-Mar-23	10:00	26	26	22	31	26	41

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003284950

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 2

Project : Berry Project

31-March-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 23 March 2023
LR Report: **CA10163-MAR23**
Reference: Wk#13 - Marathon - Berry Set 2

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#13	6: B SED Wk#13	7: B MD Wk#13	8: B QTP Wk#13	9: B LGO Wk#13	10: B HGO Wk#13
Sample Date & Time			23-Mar-23	23-Mar-23	23-Mar-23	23-Mar-23	23-Mar-23	23-Mar-23
HumCell Leachate Vol [mL]	29-Mar-23	13:31	980	978	962	959	957	958
pH [No unit]	24-Mar-23	10:01	7.39	7.54	7.54	7.32	7.32	7.37
Conductivity [uS/cm]	24-Mar-23	10:01	20	24	27	16	17	19

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003285153

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 1

Project : Berry Project

04-April-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 30 March 2023
LR Report: **CA10210-MAR23**
Reference: Wk#15 - Marathon - Berry Set 1

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#15	6: B SED-High SFE Wk#15	7: B QTP-PAG Wk#15	8: B LGO-PAG Wk#15	9: B HGO-PAG-Zn Wk#15	10: B OB-ML Wk#15
Sample Date & Time			30-Mar-23	30-Mar-23	30-Mar-23	30-Mar-23	30-Mar-23	30-Mar-23
HumCell Leachate Vol [mL]	30-Mar-23	16:38	619	653	669	645	672	480
pH [No unit]	04-Apr-23	11:30	7.28	7.37	7.28	7.18	6.85	6.89
Conductivity [uS/cm]	31-Mar-23	10:20	22	25	17	37	13	35

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003288714

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

Marathon - Berry Set 2

Project : Berry Project

04-April-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 30 March 2023
LR Report: **CA10211-MAR23**
Reference: Wk#14 - Marathon - Berry Set 2

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#14	6: B SED Wk#14	7: B MD Wk#14	8: B QTP Wk#14	9: B LGO Wk#14	10: B HGO Wk#14
Sample Date & Time			30-Mar-23	30-Mar-23	30-Mar-23	30-Mar-23	30-Mar-23	30-Mar-23
HumCell Leachate Vol [mL]	30-Mar-23	16:37	905	940	902	920	909	915
pH [No unit]	04-Apr-23	09:27	7.06	7.36	7.18	7.19	7.18	7.17
Conductivity [uS/cm]	04-Apr-23	09:26	18	22	22	16	19	21

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

0003288743

TEST REPORT
Sub-Aqueous Column

Sample Properties

BL1021-43 Detox Tls (g)	3000
Process Water Cover (mL)	2390
Initital Tailings Height in Column (cr	27.6

Analysis of Column Leachate

Parameter	Units	CCME FAL / MDMER	0	1	2	4	6	8
Date			25-Nov-22	01-Dec-22	08-Dec-22	22-Dec-22	05-Jan-23	19-Jan-23
LIMS			14520-NOV22	14059-DEC22	14281-DEC22	14616-DEC22	n/a	14495-JAN23
Volume Collected	mL	-	500	450	450	450	450	450
Temp Upon Receipt	°C	-	20.0	21.0	20.0	20.0	-	20.0
pH	no unit	6.0-9.5	7.78	7.86	7.87	8.01	-	7.72
Alkalinity	mg/L as $CaCO_3$	-	53	65	78	104	-	132
Conductivity	µS/cm	-	1840	1890	1870	1950	-	1880
Redox Potential	mV	-	164	329	333	286	-	145
TDS	mg/L	-	1260	1160	1320	1310	-	1420
F	mg/L	0.12	**0.14**	0.10	0.08	0.07	-	0.08
NO_2	as N mg/L	0.06	< 0.3	< 0.3	< 0.3	< 0.3	-	< 0.3
NO_3	as N mg/L	13	0.95	< 0.6	< 0.6	< 0.6	-	< 0.6
NO_2+NO_3	as N mg/L	-	0.95	< 0.6	< 0.06	< 0.6	-	<0.6
Cl	mg/L	120	12	9.7	7.4	7.8	-	7.6
SO_4	mg/L	-	710	760	800	910	-	860
$CN_{(T)}$	mg/L	0.50	**0.79**	**1.90**	**2.66**	**2.74**	-	**31.3**
CN_{WAD}	mg/L	0.005 as CNF	**0.774**	**1.51**	**2.25**	**2.29**	-	**0.405**
CNS	mg/L	-	< 2	5.7	5.6	4.0	-	< 2
CNO	mg/L	-	62	14 UAL	1.5	< 1	-	< 1
NH_3+NH_4	as N mg/L	-	3.6	5.8	7.3	7.2	-	1.2
Un-ionized NH_3 (calc'd)	as N mg/L	0.02 / 0.50	**0.08**	**0.16**	**0.21**	**0.28**	-	**0.02**
S_2O_3	as S_2O_3 mg/L	-	< 20	< 20	< 20	< 20	-	< 10
Hg	mg/L	0.000026 / 0.0001	**0.00004**	**0.00024**	**0.00003**	< 0.00001	-	**0.00028**
Ag	mg/L	0.00025	**0.00029**	**0.00234**	**0.00083**	**0.00031**	-	< 0.00005
Al	mg/L	0.1@pH>6.5	0.035	0.029	0.021	0.018	-	0.014
As	mg/L	0.005 / 0.10	0.0003	0.0005	0.0004	0.0006	-	0.0010
B	mg/L	1.5	0.039	0.042	0.097	0.053	-	0.062
Ba	mg/L	-	0.00789	0.00932	0.01056	0.00914	-	0.00621
Be	mg/L		< 0.000007	< 0.000007	< 0.000007	< 0.000007	-	< 0.000007
Bi	mg/L	-	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-	0.00001
Ca	mg/L	-	100	95.5	87.6	102	-	167
Cd	mg/L	0.00009	0.000021	0.000024	0.000022	0.000032	-	0.000059
Co	mg/L	-	0.00479	0.00247	0.00389	0.0102	-	0.0250
Cr	mg/L	-	0.00011	< 0.00008	0.00016	< 0.00008	-	0.0148
Cu	mg/L	0.002 / 0.10	**0.743**	**1.63**	**2.70**	**2.45**	-	**0.309**
Fe	mg/L	0.3	0.030	< 0.007	< 0.007	0.036	-	**13.2**
K	mg/L	-	7.09	11.9	10.2	10.7	-	3.64
Li	mg/L	-	0.0037	0.0038	0.0018	0.0012	-	0.0014
Mg	mg/L	-	4.81	7.20	6.73	8.10	-	13.5
Mn	mg/L	-	0.103	0.0543	0.0848	0.0959	-	0.145
Mo	mg/L	0.073	0.0163	0.0342	0.0377	0.0382	-	0.0325
Na	mg/L	-	256	299	287	316	-	263
Ni	mg/L	0.025 / 0.25	0.0123	0.0012	0.0019	0.0041	-	0.0049
P	mg/L	-	0.013	0.007	0.006	0.004	-	0.010
Pb	mg/L	0.001 / 0.08	**0.00103**	< 0.00009	< 0.00009	< 0.00009	-	0.00011
S	mg/L	-	292	302	293	312	-	306
Sb	mg/L	-	0.0013	0.0012	0.0013	0.0013	-	0.0013
Se	mg/L	0.001 / 0.005	**0.00131**	0.00060	0.00036	0.00029	-	**0.00115**
Si	mg/L	-	1.25	2.36	2.23	2.45	-	4.62
Sn	mg/L	-	0.00389	0.00023	0.00025	0.00016	-	0.00056
Sr	mg/L	-	0.351	0.361	0.347	0.367	-	0.574
Th	mg/L	-	< 0.0001	< 0.0001	0.0008	< 0.0001	-	< 0.0001
Ti	mg/L	-	< 0.00005	< 0.00005	< 0.00005	0.00010	-	0.00011
Tl	mg/L	0.0008	< 0.000005	0.000007	0.000019	0.000008	-	< 0.000005
U	mg/L	0.015	0.000524	0.000253	0.000379	0.000868	-	0.000780
V	mg/L	-	0.00002	0.00003	0.00004	0.00003	-	0.00006
W	mg/L	-	0.00009	0.00010	0.00010	0.00006	-	0.00033
Y	mg/L	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	-	< 0.00002
Zn	mg/L	0.007 / 0.40	< 0.002	**0.009**	**0.015**	**0.011**	-	0.002

Parameters outside the CCME FAL guidelines are indicated in bold type.
Parameters outside the MDMER limits are indicated in bold blue type.

Raised RL's for CNS, Nitrates + S_2O_3 due to sample matrix
UAL=CNO process past holding time

TEST REPORT
Sub-Aqueous Column

Sample Properties

BL1021-43 Detox Tls (g)	3000
Process Water Cover (mL)	2390
Initital Tailings Height in Column (cr	27.6

Analysis of Column Leachate

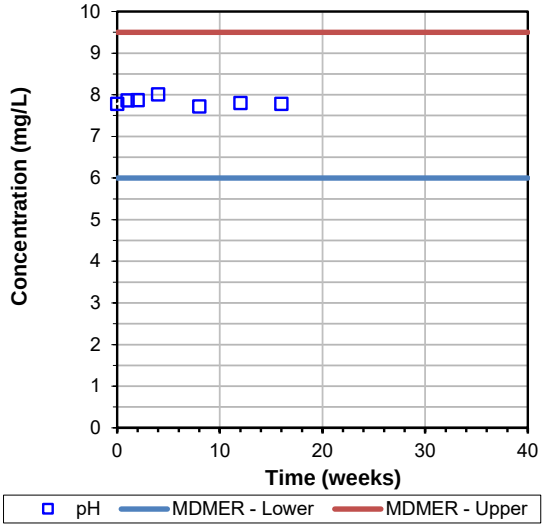
Parameter	Units	CCME FAL / MDMER	10	12	14	16	18
Date			02-Feb-23	16-Feb-23	02-Mar-23	16-Mar-23	30-Mar-23
LIMS			n/a	14400-FEB23	n/a	14415-MAR23	n/a
Volume Collected	mL	-	400	450	450	450	
Temp Upon Receipt	°C	-	-	20.0	-	19.0	-
pH	no unit	6.0-9.5	-	7.80	-	7.78	-
Alkalinity	mg/L as $CaCO_3$	-	-	53	-	49	-
Conductivity	µS/cm	-	-	1590	-	1540	-
Redox Potential	mV	-	-	122	-	122	-
TDS	mg/L	-	-	1250	-	1090	-
F	mg/L	0.12	-	0.10	-	**0.15**	-
NO_2	as N mg/L	0.06	-	< 0.3	-	< 0.3	-
NO_3	as N mg/L	13	-	< 0.6	-	< 0.6	-
NO_2+NO_3	as N mg/L	-	-	< 0.6	-	< 0.6	-
Cl	mg/L	120	-	8.3	-	6.0	-
SO_4	mg/L	-	-	790	-	680	-
$CN_{(T)}$	mg/L	0.50	-	**16.7**	-	**23.9**	-
CN_{WAD}	mg/L	0.005 as CNF	-	**0.19**	-	**0.084**	-
CNS	mg/L	-	-	< 2	-	< 2	-
CNO	mg/L	-	-	< 1	-	< 1	-
NH_3+NH_4	as N mg/L	-	-	0.5	-	0.3	-
Un-ionized NH_3 (calc'd)	as N mg/L	0.02 / 0.50	-	0.01	-	0.01	-
S_2O_3	as S_2O_3 mg/L	-	-	< 2	-	< 10	-
Hg	mg/L	0.000026 / 0.0001	-	**0.00005**	-	< 0.00001	-
Ag	mg/L	0.00025	-	< 0.0005	-	< 0.00005	-
Al	mg/L	0.1@pH>6.5	-	0.03	-	0.014	-
As	mg/L	0.005 / 0.10	-	**0.012**	-	0.0009	-
B	mg/L	1.5	-	0.04	-	0.047	-
Ba	mg/L	-	-	0.0172	-	0.0110	-
Be	mg/L		-	0.00023	-	< 0.000007	-
Bi	mg/L	-	-	< 0.0001	-	0.00440	-
Ca	mg/L	-	-	135	-	90.7	-
Cd	mg/L	0.00009	-	**0.00053**	-	0.000010	-
Co	mg/L	-	-	0.0156	-	0.00829	-
Cr	mg/L	-	-	0.0022	-	0.00077	-
Cu	mg/L	0.002 / 0.10	-	**0.045**	-	**0.0397**	-
Fe	mg/L	0.3	-	**8.23**	-	**11.3**	-
K	mg/L	-	-	1.85	-	1.84	-
Li	mg/L	-	-	< 0.001	-	0.0118	-
Mg	mg/L	-	-	10.4	-	11.9	-
Mn	mg/L	-	-	0.225	-	0.153	-
Mo	mg/L	0.073	-	0.0416	-	0.0656	-
Na	mg/L	-	-	201	-	242	-
Ni	mg/L	0.025 / 0.25	-	0.002	-	0.0053	-
P	mg/L	-	-	0.12	-	0.050	-
Pb	mg/L	0.001 / 0.08	-	< 0.0009	-	0.00025	-
S	mg/L	-	-	317	-	231	-
Sb	mg/L	-	-	< 0.009	-	0.0011	-
Se	mg/L	0.001 / 0.005	-	**0.0111**	-	0.00035	-
Si	mg/L	-	-	2.2	-	2.33	-
Sn	mg/L	-	-	0.0019	-	0.00099	-
Sr	mg/L	-	-	0.496	-	0.344	-
Th	mg/L	-	-	0.002	-	0.006	-
Ti	mg/L	-	-	0.0080	-	0.00007	-
Tl	mg/L	0.0008	-	< 0.00005	-	< 0.000005	-
U	mg/L	0.015	-	0.00019	-	0.000110	-
V	mg/L	-	-	0.0003	-	0.00159	-
W	mg/L	-	-	< 0.0002	-	0.00039	-
Y	mg/L	-	-	< 0.0002	-	0.00004	-
Zn	mg/L	0.007 / 0.40	-	< 0.02	-	**0.028**	-

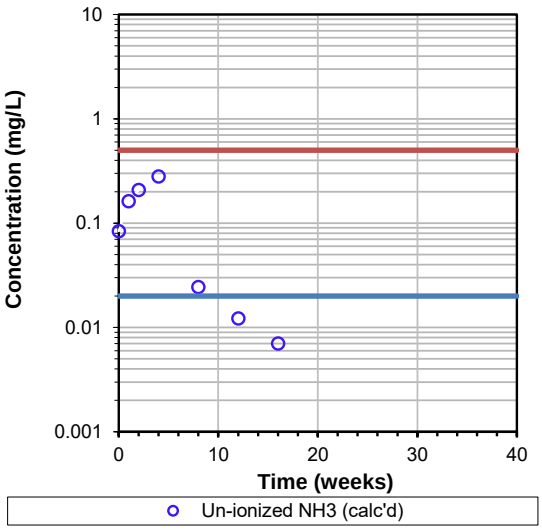
Parameters outside the CCME FAL guidelines are indicated in bol
Parameters outside the MDMER limits are indicated in bold blue t

RL raised 10 x for metals due to sample matrix interference
Column top-ups with Li spiked DI water (5 mg/L) starting upon comple

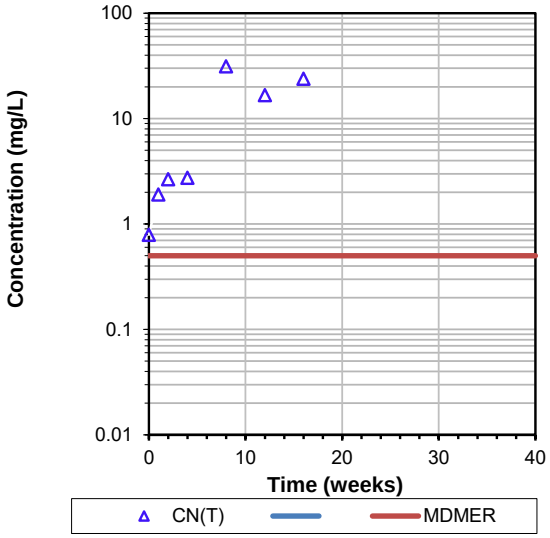
TEST REPORT
Sub-Aqueous Column

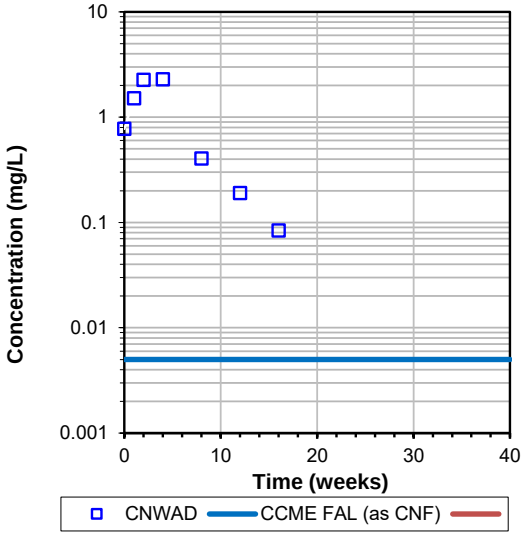
Selected Parameters - BL1021-43 Detox Tls (g)





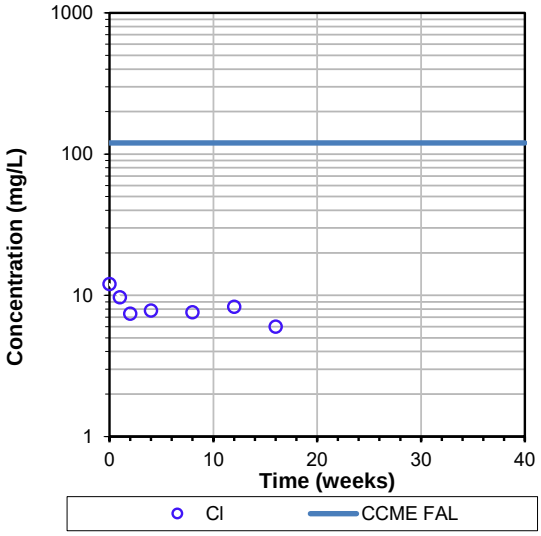
Selected Parameters - BL1021-43 Detox Tls (g)

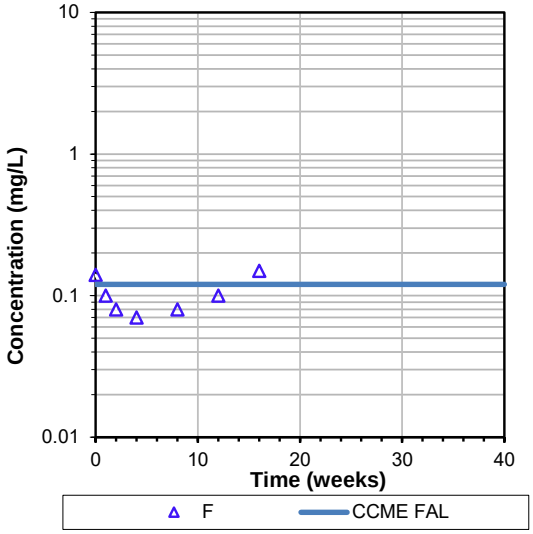




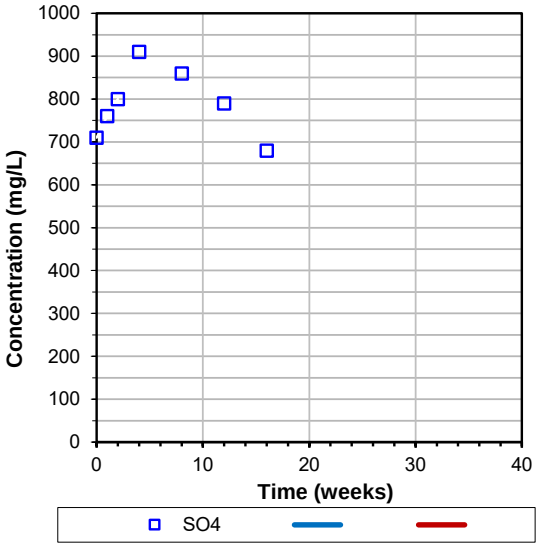
TEST REPORT
Sub-Aqueous Column

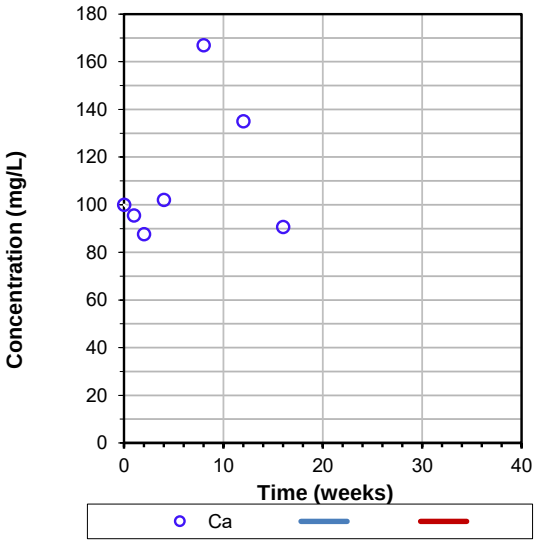
Selected Parameters - BL1021-43 Detox Tls (g)





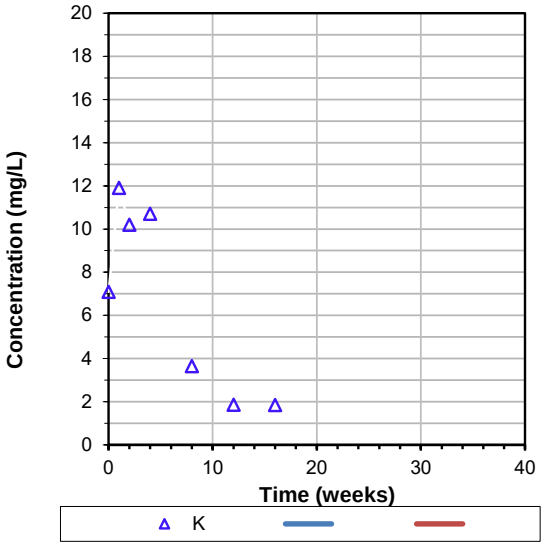
Selected Parameters - BL1021-43 Detox Tls (g)

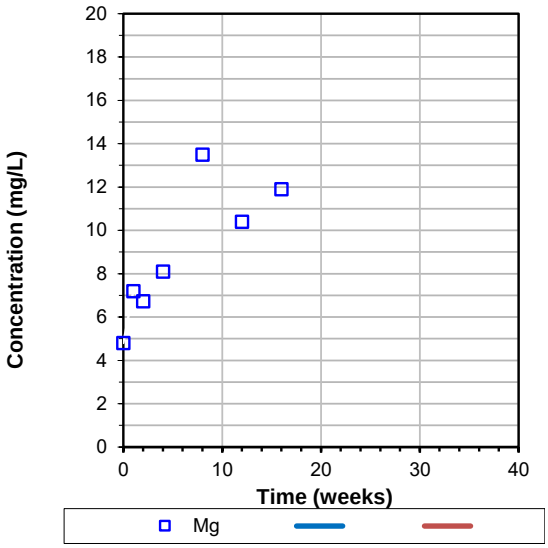




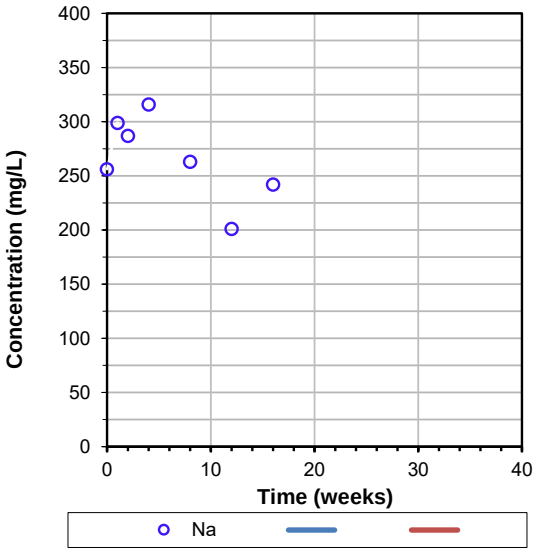
TEST REPORT
Sub-Aqueous Column

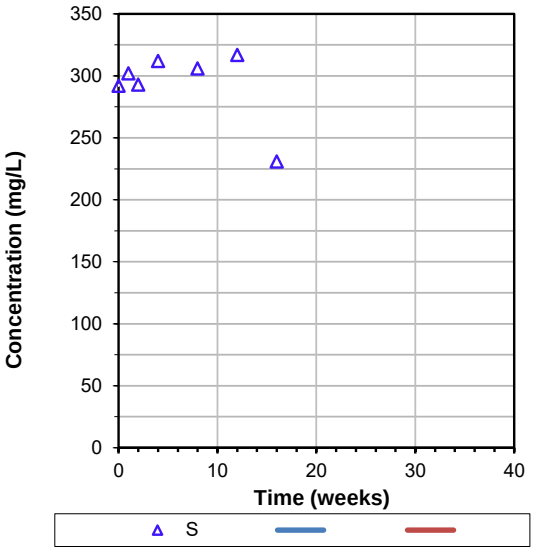
Selected Parameters - BL1021-43 Detox Tls (g)





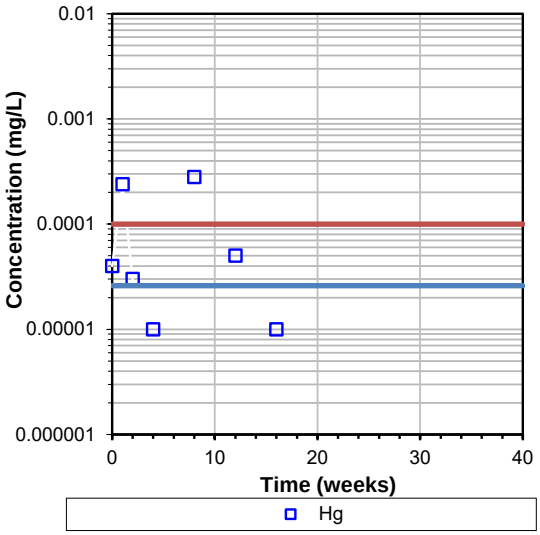
Selected Parameters - BL1021-43 Detox Tls (g)

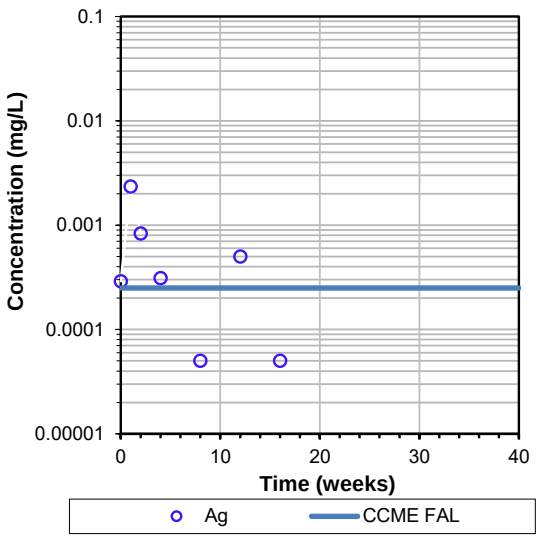




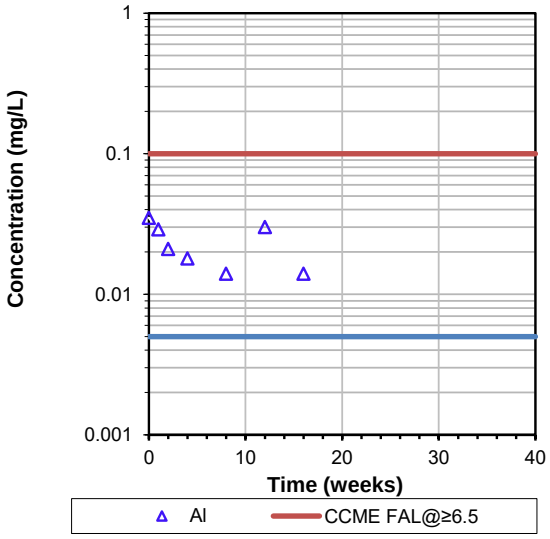
TEST REPORT
Sub-Aqueous Column

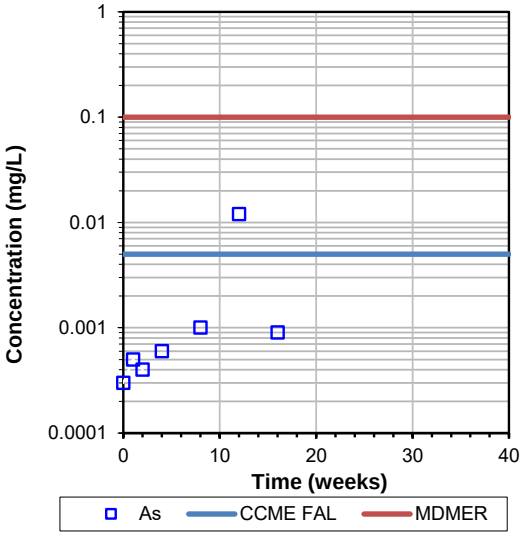
Selected Parameters - BL1021-43 Detox Tls (g)





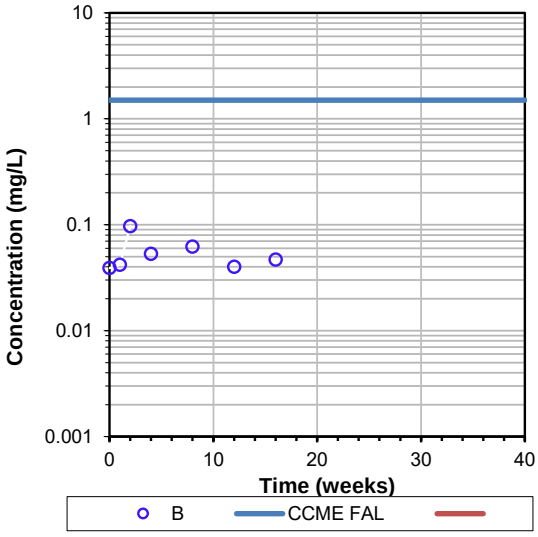
Selected Parameters - BL1021-43 Detox Tls (g)

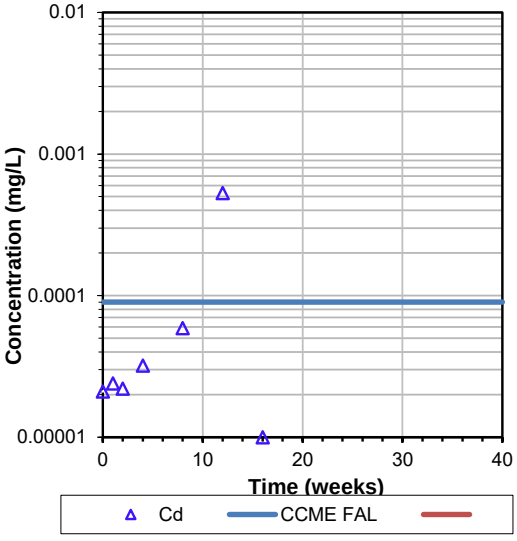




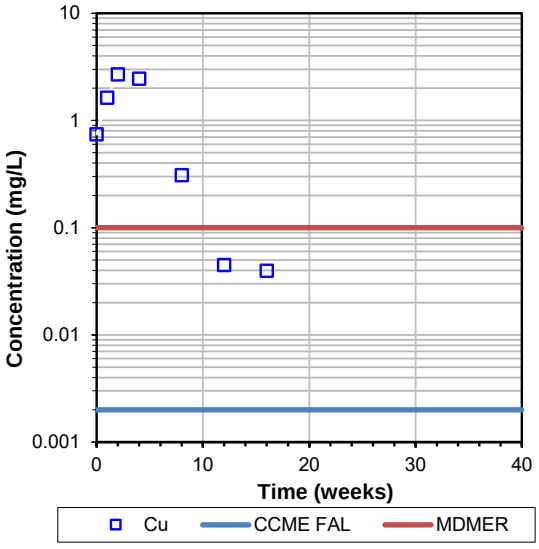
TEST REPORT
Sub-Aqueous Column

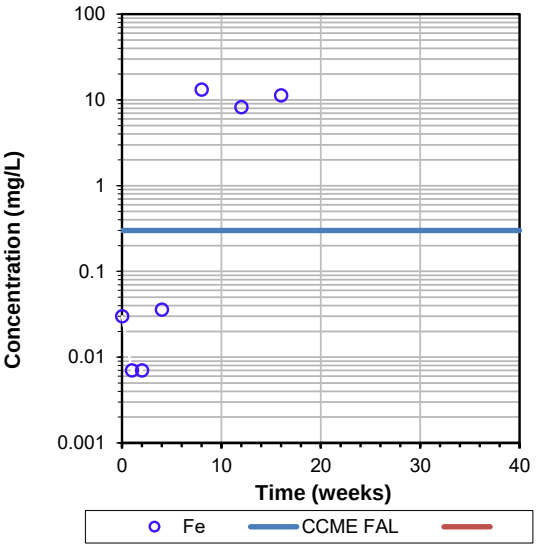
Selected Parameters - BL1021-43 Detox Tls (g)





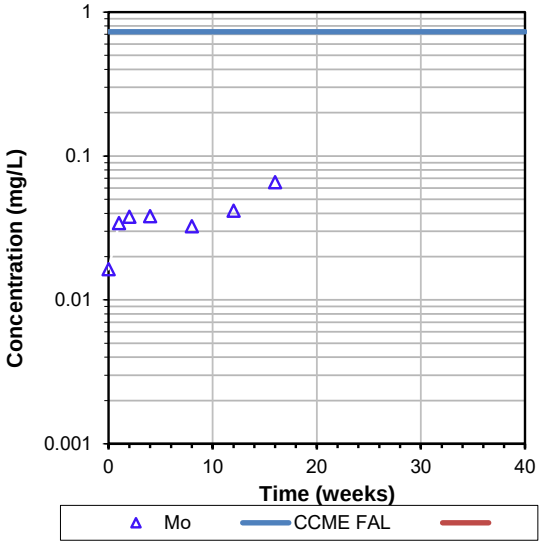
Selected Parameters - BL1021-43 Detox Tls (g)

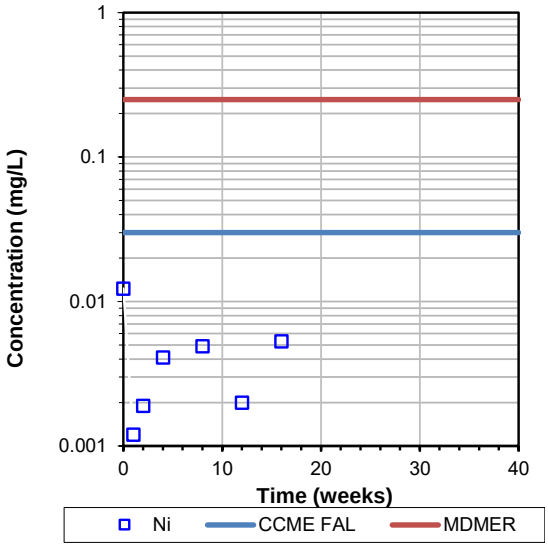




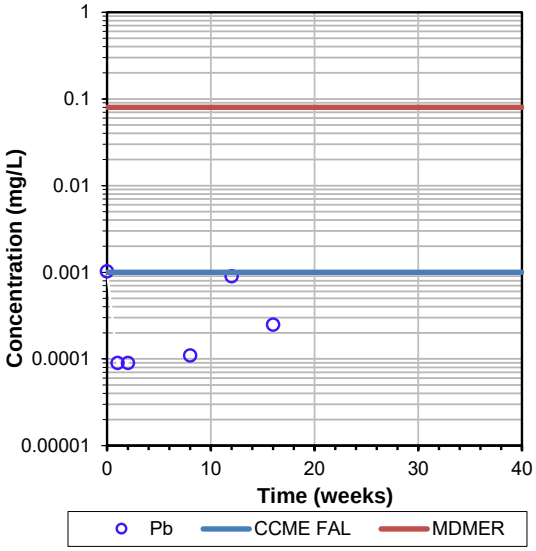
TEST REPORT
Sub-Aqueous Column

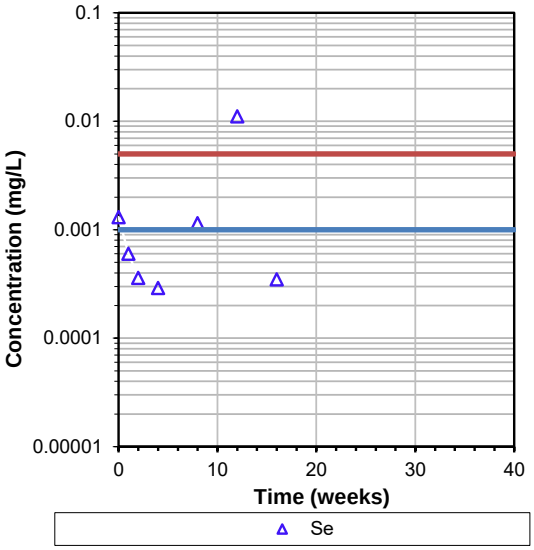
Selected Parameters - BL1021-43 Detox Tls (g)





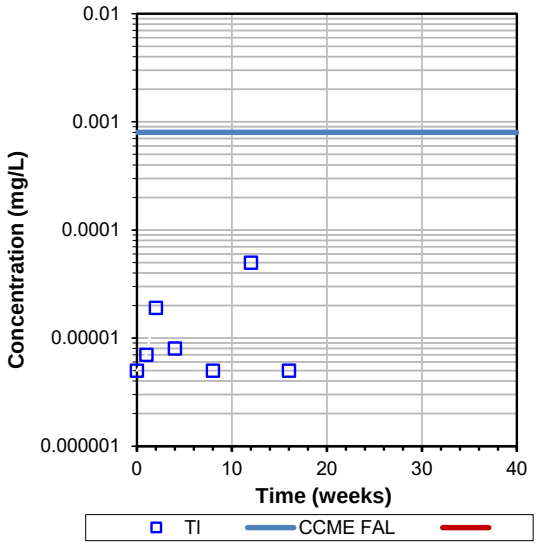
Selected Parameters - BL1021-43 Detox Tls (g)

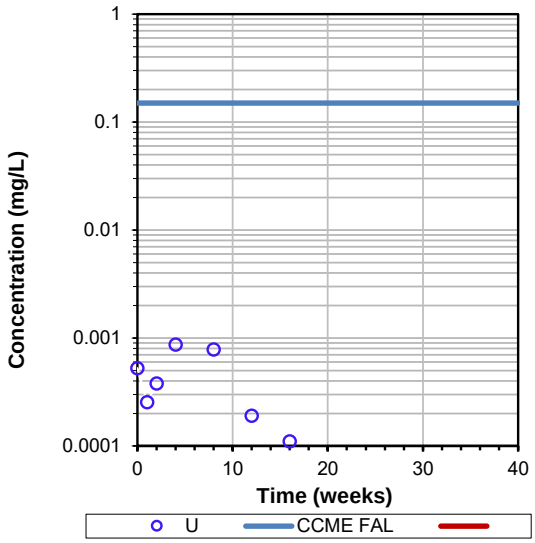




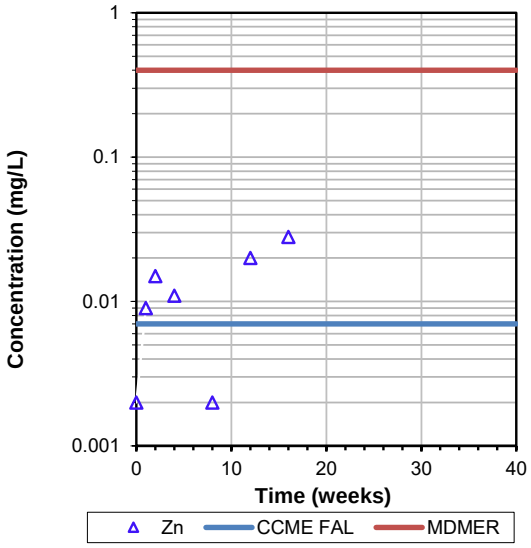
TEST REPORT
Sub-Aqueous Column

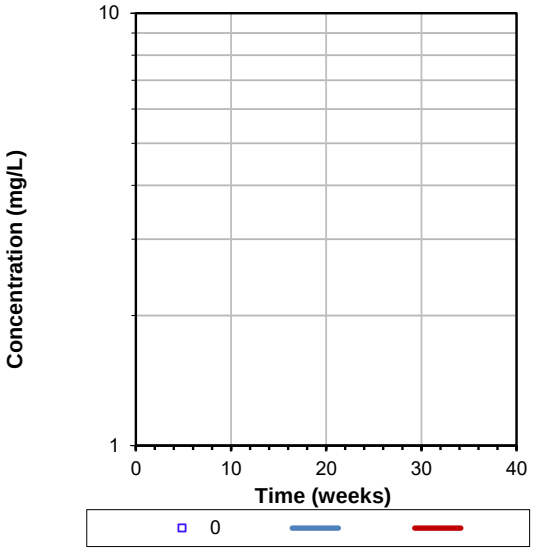
Selected Parameters - BL1021-43 Detox Tls (g)





Selected Parameters - BL1021-43 Detox Tls (g)





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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

06-April-2023

Marathon Gold Corp
Attn : James Powell

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A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 04 April 2023
LR Report: **CA10020-APR23**
Reference: Wk#7 - Marathon - Berry Set 1 NP Depleted Hum Cells

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-COQ 3DP Wk#7	6: B TP-PAG-CO3DL P Wk#7	7: B GO-PAG-CO3D P Wk#7	8: B HGO-PAG-Zn-C O3DP Wk#7
Sample Date & Time			04-Apr-23	04-Apr-23	04-Apr-23	04-Apr-23
HumCell Leachate Vol [mL]	05-Apr-23	16:35	634	657	604	651
pH [No unit]	05-Apr-23	12:34	4.93	4.87	4.50	5.09
Conductivity [uS/cm]	05-Apr-23	12:34	18	17	46	13

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OnLine LIMS

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

06-April-2023

Marathon Gold Corp
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Fax:

Date Rec. : 21 March 2023
LR Report: **CA10141-MAR23**
Reference: Wk#5 - Marathon - Berry Set 1 NP Depleted Hum Cells

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-COQ 3DP Wk#5	6: B TP-PAG-CO3DL P Wk#5	7: B GO-PAG-CO3D P Wk#5	8: B HGO-PAG-Zn-C O3DP Wk#5
Sample Date & Time			21-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23
HumCell Leachate Vol [mL]	22-Mar-23	09:19	677	610	605	669
pH [No unit]	06-Apr-23	10:39	5.04	5.32	4.72	5.60
Conductivity [uS/cm]	06-Apr-23	10:39	32	10	27	6

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

06-April-2023

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Date Rec. : 28 March 2023
LR Report: **CA10188-MAR23**
Reference: Wk#6 - Marathon - Berry Set 1 NP Depleted Hum Cells

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-COQ 3DP Wk#6	6: B TP-PAG-CO3DL P Wk#6	7: B LGO-PAG-CO3D P Wk#6	8: B HGO-PAG-Zn-C O3DP Wk#6
Sample Date & Time			28-Mar-23	28-Mar-23	28-Mar-23	28-Mar-23
HumCell Leachate Vol [mL]	28-Mar-23	14:49	618	613	554	624
pH [No unit]	29-Mar-23	11:14	4.78	5.14	4.56	4.99
Acidity [mg/L as CaCO3]	29-Mar-23	11:14	7	6	17	5
Alkalinity [mg/L as CaCO3]	29-Mar-23	11:14	< 2	< 2	< 2	< 2
Conductivity [uS/cm]	29-Mar-23	11:14	31	14	34	11
SO4 [mg/L]	30-Mar-23	10:13	11	5.1	12	3.7
F [mg/L]	29-Mar-23	09:16	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	30-Mar-23	10:45	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	06-Apr-23	12:37	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	06-Apr-23	12:37	0.038	0.005	0.063	0.003
As [mg/L]	06-Apr-23	12:37	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Ba [mg/L]	06-Apr-23	12:37	0.00038	0.00012	0.00049	< 0.00008
Be [mg/L]	06-Apr-23	12:37	0.000046	0.000008	0.000036	< 0.000007
B [mg/L]	06-Apr-23	12:37	< 0.002	< 0.002	< 0.002	< 0.002
Bi [mg/L]	06-Apr-23	12:37	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	06-Apr-23	12:37	3.14	1.46	2.97	1.05
Cd [mg/L]	06-Apr-23	12:37	0.000108	0.000016	0.000006	0.000006
Co [mg/L]	06-Apr-23	12:37	0.00607	0.000410	0.00275	0.000369
Cr [mg/L]	06-Apr-23	12:37	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	06-Apr-23	12:37	0.0117	0.0046	0.0461	0.0025
Fe [mg/L]	06-Apr-23	12:37	0.219	0.031	0.350	0.013
K [mg/L]	06-Apr-23	12:37	0.139	0.041	0.064	0.040
Li [mg/L]	06-Apr-23	12:37	0.0003	0.0002	0.0003	< 0.0001
Mg [mg/L]	06-Apr-23	12:37	0.258	0.094	0.179	0.053
Mn [mg/L]	06-Apr-23	12:37	0.0665	0.0931	0.0370	0.0105
Mo [mg/L]	06-Apr-23	12:37	0.00035	0.00045	0.00277	0.00031

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

LR Report : **CA10188-MAR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-COQ 3DP Wk#6	6: B TP-PAG-CO3DL P Wk#6	7: B GO-PAG-CO3D P Wk#6	8: B HGO-PAG-Zn-C O3DP Wk#6
Na [mg/L]	06-Apr-23	12:37	0.64	0.37	0.38	0.25
Ni [mg/L]	06-Apr-23	12:37	0.0036	0.0034	0.0030	0.0007
Pb [mg/L]	06-Apr-23	12:37	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	06-Apr-23	12:37	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	06-Apr-23	12:37	0.00014	< 0.00004	< 0.00004	< 0.00004
Sr [mg/L]	06-Apr-23	12:37	0.00355	0.00083	0.00422	0.00074
Sn [mg/L]	06-Apr-23	12:37	0.00016	0.00015	0.00028	0.00009
Ti [mg/L]	06-Apr-23	12:37	< 0.00005	< 0.00005	0.00005	< 0.00005
Tl [mg/L]	06-Apr-23	12:37	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	06-Apr-23	12:37	0.000059	0.000013	0.000673	0.000060
V [mg/L]	06-Apr-23	12:37	< 0.00001	< 0.00001	< 0.00001	< 0.00001
W [mg/L]	06-Apr-23	12:37	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Y [mg/L]	06-Apr-23	12:37	0.00018	< 0.00002	0.00023	< 0.00002
Zn [mg/L]	06-Apr-23	12:37	0.022	0.010	0.011	0.017

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Marathon - Berry Set 1

Project : Berry Project

20-April-2023

Marathon Gold Corp
Attn : James Powell

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Date Rec. : 06 April 2023
LR Report: **CA10041-APR23**
Reference: Wk#16 - Marathon - Berry Set 1

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#16	6: B SED-High SFE Wk#16	7: B QTP-PAG Wk#16	8: B LGO-PAG Wk#16
Sample Date & Time			6-Apr-23	6-Apr-23	6-Apr-23	6-Apr-23
HumCell Leachate Vol [mL]	10-Apr-23	10:10	622	706	703	659
pH [No unit]	12-Apr-23	09:38	7.39	7.54	7.23	7.30
Acidity [mg/L as CaCO3]	12-Apr-23	09:38	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	13-Apr-23	13:15	8	10	7	9
Conductivity [uS/cm]	12-Apr-23	09:38	22	23	20	38
SO4 [mg/L]	11-Apr-23	11:02	2.5	0.5	2.6	8.0
F [mg/L]	10-Apr-23	11:52	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	11-Apr-23	15:47	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	17-Apr-23	14:08	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	17-Apr-23	14:08	0.035	0.047	0.015	0.017
As [mg/L]	17-Apr-23	14:08	< 0.0002	< 0.0002	0.0003	< 0.0002
Ba [mg/L]	17-Apr-23	14:08	0.00011	0.00100	0.00046	0.00093
Be [mg/L]	17-Apr-23	14:08	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	17-Apr-23	14:08	0.004	< 0.002	0.014	0.005
Bi [mg/L]	17-Apr-23	14:08	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	17-Apr-23	14:08	4.43	4.19	3.91	6.75
Cd [mg/L]	17-Apr-23	14:08	< 0.000003	0.000003	< 0.000003	< 0.000003
Co [mg/L]	17-Apr-23	14:08	0.000007	0.000031	0.000017	0.000035
Cr [mg/L]	17-Apr-23	14:08	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	17-Apr-23	14:08	0.0005	< 0.0002	0.0006	0.0007
Fe [mg/L]	17-Apr-23	14:08	< 0.007	< 0.007	< 0.007	< 0.007
K [mg/L]	17-Apr-23	14:08	0.123	0.638	0.158	0.106
Li [mg/L]	17-Apr-23	14:08	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mg [mg/L]	17-Apr-23	14:08	0.140	0.290	0.131	0.184
Mn [mg/L]	17-Apr-23	14:08	0.0196	0.0290	0.0197	0.0317
Mo [mg/L]	17-Apr-23	14:08	0.00081	0.00334	0.00126	0.00266

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10041-APR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#16	6: B SED-High SFE Wk#16	7: B QTP-PAG Wk#16	8: B LGO-PAG Wk#16
Na [mg/L]	17-Apr-23	14:08	0.17	0.14	0.23	0.21
Ni [mg/L]	17-Apr-23	14:08	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Pb [mg/L]	17-Apr-23	14:08	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	17-Apr-23	14:08	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	17-Apr-23	14:08	0.00017	0.00006	0.00012	0.00007
Sr [mg/L]	17-Apr-23	14:08	0.00304	0.0230	0.00664	0.00655
Sn [mg/L]	17-Apr-23	14:08	0.00027	0.00017	0.00028	< 0.00006
Ti [mg/L]	17-Apr-23	14:08	0.00007	0.00018	0.00009	0.00005
Tl [mg/L]	17-Apr-23	14:08	< 0.000005	0.000006	< 0.000005	0.000018
U [mg/L]	17-Apr-23	14:08	0.000099	0.00491	0.000136	0.00395
V [mg/L]	17-Apr-23	14:08	0.00002	0.00035	0.00003	0.00002
W [mg/L]	17-Apr-23	14:08	0.00007	0.00006	0.00008	0.00008
Y [mg/L]	17-Apr-23	14:08	< 0.00002	0.00003	< 0.00002	0.00003
Zn [mg/L]	17-Apr-23	14:08	< 0.002	< 0.002	< 0.002	< 0.002

Analysis	9: B HGO-PAG-Zn Wk#16	10: B OB-ML Wk#16
Sample Date & Time	6-Apr-23	6-Apr-23
HumCell Leachate Vol [mL]	711	538
pH [No unit]	7.15	7.12
Acidity [mg/L as CaCO3]	< 2	< 2
Alkalinity [mg/L as CaCO3]	6	6
Conductivity [uS/cm]	14	48
SO4 [mg/L]	1.4	11
F [mg/L]	< 0.06	< 0.06
Hg [mg/L]	< 0.00001	< 0.00001
Ag [mg/L]	< 0.00005	< 0.00005
Al [mg/L]	0.016	0.045
As [mg/L]	0.0004	0.0016
Ba [mg/L]	0.00018	0.00406
Be [mg/L]	< 0.000007	< 0.000007
B [mg/L]	0.003	0.004
Bi [mg/L]	< 0.00001	< 0.00001
Ca [mg/L]	2.60	8.53
Cd [mg/L]	< 0.000003	0.000012
Co [mg/L]	0.000011	0.000102
Cr [mg/L]	< 0.00008	0.00010
Cu [mg/L]	0.0003	0.0041
Fe [mg/L]	< 0.007	0.036
K [mg/L]	0.114	0.297

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Analysis	9: B HGO-PAG-Zn Wk#16	10: B OB-ML Wk#16
Li [mg/L]	< 0.0001	< 0.0001
Mg [mg/L]	0.118	0.414
Mn [mg/L]	0.0176	0.0139
Mo [mg/L]	0.00186	0.00603
Na [mg/L]	0.16	0.24
Ni [mg/L]	< 0.0001	0.0002
Pb [mg/L]	< 0.00009	< 0.00009
Sb [mg/L]	< 0.0009	< 0.0009
Se [mg/L]	0.00068	0.00053
Sr [mg/L]	0.00565	0.0150
Sn [mg/L]	< 0.00006	0.00028
Ti [mg/L]	0.00011	0.00135
Tl [mg/L]	< 0.000005	0.000008
U [mg/L]	0.000084	0.00382
V [mg/L]	0.00004	0.00118
W [mg/L]	0.00019	0.00012
Y [mg/L]	< 0.00002	0.00009
Zn [mg/L]	< 0.002	< 0.002

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Lisa Thompson
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Marathon - Berry Set 1

Project : Berry Project

26-April-2023

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Phone: 709-730-5046
Fax:

Date Rec. : 13 April 2023
LR Report: **CA10090-APR23**
Reference: Wk#17 - Berry Project

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#17	6: B SED-High SFE Wk#17	7: B QTP-PAG Wk#17	8: B LGO-PAG Wk#17	9: B HGO-PAG-Zn Wk#17
Sample Date & Time			13-Apr-23	13-Apr-23	13-Apr-23	13-Apr-23	13-Apr-23
HumCell Leachate Vol [mL]	13-Apr-23	13:05	610	710	690	650	700
pH [No unit]	19-Apr-23	16:39	7.04	7.46	7.51	7.02	7.53
Conductivity [uS/cm]	14-Apr-23	13:36	27	32	22	37	18

Analysis	10: B OB-ML Wk#17
Sample Date & Time	13-Apr-23
HumCell Leachate Vol [mL]	535
pH [No unit]	6.95
Conductivity [uS/cm]	54

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Lisa Thompson
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Environment, Health & Safety

OnLine LIMS

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

26-April-2023

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Phone: 709-730-5046
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Date Rec. : 18 April 2023
LR Report: **CA10117-APR23**
Reference: Wk#9 - Marathon - Berry Set 1 NP Depleted Hum Cells

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#9	6: B QTP-PAG-CO3DLP Wk#9	7: B LGO-PAG-CO3DP Wk#9	8: B HGO-PAG-Zn-CO3DP Wk#9
Sample Date & Time			18-Apr-23	18-Apr-23	18-Apr-23	18-Apr-23
HumCell Leachate Vol [mL]	19-Apr-23	16:30	655	636	607	653
pH [No unit]	19-Apr-23	12:55	4.77	4.91	4.29	5.06
Conductivity [uS/cm]	19-Apr-23	12:55	28	23	57	16

<original signed by>

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Project Specialist Assistant,
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OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

26-April-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 20 April 2023
LR Report: **CA10140-APR23**
Reference: Wk#17 - Marathon - Berry Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPORB SED Wk#17	6: B MD Wk#17	7: B QTP Wk#17	8: B LGO Wk#17	9: B HGO Wk#17	10:
Sample Date & Time			20-Apr-23	20-Apr-23	20-Apr-23	20-Apr-23	20-Apr-23	20-Apr-23
HumCell Leachate Vol [mL]	21-Apr-23	10:48	1004	991	978	970	957	968
pH [No unit]	25-Apr-23	10:52	7.77	9.23	7.65	7.64	7.30	7.30
Acidity [mg/L as CaCO3]	21-Apr-23	10:35	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	21-Apr-23	10:35	8	11	10	10	7	7
Conductivity [uS/cm]	21-Apr-23	10:35	18	22	22	16	16	21
SO4 [mg/L]	26-Apr-23	08:52	< 2	< 2	< 2	< 2	< 2	< 2

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

27-April-2023

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Date Rec. : 13 April 2023
LR Report: **CA10091-APR23**
Reference: Wk#16 - Marathon - Berry Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#16	6: B SED Wk#16	7: B MD Wk#16	8: B QTP Wk#16	9: B LGO Wk#16	10: B HGO Wk#16
Sample Date & Time			13-Apr-23	13-Apr-23	13-Apr-23	13-Apr-23	13-Apr-23	13-Apr-23
HumCell Leachate Vol [mL]	13-Apr-23	13:06	996	997	1004	993	1001	1006
pH [No unit]	17-Apr-23	12:15	7.41	7.87	7.40	7.13	7.16	7.51
Acidity [mg/L as CaCO3]	14-Apr-23	12:29	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	14-Apr-23	12:29	8	10	12	10	9	7
Conductivity [uS/cm]	14-Apr-23	12:29	18	22	30	23	22	19
SO4 [mg/L]	26-Apr-23	10:06	0.5	0.2	1.2	0.5	0.8	1.8
F [mg/L]	14-Apr-23	11:04	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	14-Apr-23	16:49	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	20-Apr-23	16:08	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	20-Apr-23	16:08	0.039	0.050	0.045	0.037	0.034	0.029
As [mg/L]	20-Apr-23	16:08	0.0005	0.0003	0.0004	< 0.0002	< 0.0002	< 0.0002
Ba [mg/L]	20-Apr-23	16:08	0.00035	0.00649	0.00049	0.00057	0.00017	0.00017
Be [mg/L]	20-Apr-23	16:08	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	20-Apr-23	16:08	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002
Bi [mg/L]	20-Apr-23	16:08	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	20-Apr-23	16:08	3.62	3.89	4.46	3.59	3.18	3.70
Cd [mg/L]	20-Apr-23	16:08	0.000013	0.000005	0.000005	0.000003	0.000003	0.000004
Co [mg/L]	20-Apr-23	16:08	0.000004	0.000009	0.000031	< 0.000004	< 0.000004	0.000029
Cr [mg/L]	20-Apr-23	16:08	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	20-Apr-23	16:08	< 0.0002	0.0002	< 0.0002	0.0003	0.0003	0.0002
Fe [mg/L]	20-Apr-23	16:08	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
K [mg/L]	20-Apr-23	16:08	0.275	0.379	0.234	0.176	0.124	0.149
Li [mg/L]	20-Apr-23	16:08	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mg [mg/L]	20-Apr-23	16:08	0.164	0.311	0.310	0.192	0.114	0.145
Mn [mg/L]	20-Apr-23	16:08	0.0298	0.0331	0.0209	0.0373	0.0259	0.0321
Mo [mg/L]	20-Apr-23	16:08	0.00066	0.00098	0.00310	0.00100	0.00033	0.00146
Na [mg/L]	20-Apr-23	16:08	0.09	0.05	0.09	0.11	0.12	0.09
Ni [mg/L]	20-Apr-23	16:08	0.0016	0.0015	0.0016	0.0016	0.0015	0.0016
Pb [mg/L]	20-Apr-23	16:08	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	20-Apr-23	16:08	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	20-Apr-23	16:08	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004
Sr [mg/L]	20-Apr-23	16:08	0.00428	0.0272	0.0119	0.0112	0.00510	0.00731

OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10091-APR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#16	6: B SED Wk#16	7: B MD Wk#16	8: B QTP Wk#16	9: B LGO Wk#16	10: B HGO Wk#16
Sn [mg/L]	20-Apr-23	16:08	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006	0.00012
Ti [mg/L]	20-Apr-23	16:08	0.00007	0.00012	0.00032	0.00015	0.00006	0.00016
Tl [mg/L]	20-Apr-23	16:08	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	0.000026
U [mg/L]	27-Apr-23	09:35	0.000320	0.00108	0.00157	0.000256	0.000943	0.00222
V [mg/L]	20-Apr-23	16:08	0.00010	0.00033	0.00791	0.00009	0.00005	0.00004
W [mg/L]	20-Apr-23	16:08	< 0.00002	0.00003	0.00003	0.00003	< 0.00002	0.00002
Y [mg/L]	20-Apr-23	16:08	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Zn [mg/L]	20-Apr-23	16:08	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

<original signed by>

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Environment, Health & Safety

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

27-April-2023

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Date Rec. : 25 April 2023
LR Report: **CA10166-APR23**
Reference: Wk#10 - Marathon - Berry Set 1 NP Depleted Hum Cells

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#10	6: B QTP-PAG-CO3 DP Wk#10	7: B LGO-PAG-CO3 DP Wk#10	8: B HGO-PAG-Zn-CO3DP Wk#10
Sample Date & Time			25-Apr-23	25-Apr-23	25-Apr-23	25-Apr-23
HumCell Leachate Vol [mL]	26-Apr-23	09:21	650	606	609	656
pH [No unit]	27-Apr-23	10:06	5.32	5.44	4.45	5.41
Conductivity [uS/cm]	27-Apr-23	10:06	26	21	44	20

<original signed by>

Lisa Thompson
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OnLine LIMS

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

28-April-2023

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Date Rec. : 11 April 2023
LR Report: **CA10068-APR23**
Reference: Wk#8

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CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#8	6: B QTP-PAG-CO3DLP Wk#8	7: B LGO-PAG-CO3DP Wk#8	8: B HGO-PAG-Zn-CO3DP Wk#8
Sample Date & Time			11-Apr-23	11-Apr-23	11-Apr-23	11-Apr-23
HumCell Leachate Vol [mL]	12-Apr-23	09:17	653	655	602	646
pH [No unit]	14-Apr-23	09:53	5.23	5.04	4.60	5.15
Acidity [mg/L as CaCO3]	14-Apr-23	09:53	4	4	8	4
Alkalinity [mg/L as CaCO3]	14-Apr-23	09:53	< 2	< 2	< 2	< 2
Conductivity [uS/cm]	14-Apr-23	09:53	19	17	38	10
SO4 [mg/L]	28-Apr-23	09:06	7.0	6.2	14	3.6
F [mg/L]	12-Apr-23	10:31	< 0.06	< 0.06	0.07	< 0.06
Hg [mg/L]	17-Apr-23	12:23	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	21-Apr-23	14:14	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	21-Apr-23	14:14	0.034	0.006	0.243	0.002
As [mg/L]	21-Apr-23	14:14	< 0.0002	< 0.0002	0.0004	< 0.0002
Ba [mg/L]	21-Apr-23	14:14	0.00030	0.00014	0.00029	0.00010
Be [mg/L]	21-Apr-23	14:14	0.000042	0.000014	0.000068	0.000007
B [mg/L]	21-Apr-23	14:14	< 0.002	< 0.002	< 0.002	0.002
Bi [mg/L]	21-Apr-23	14:14	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	21-Apr-23	14:14	1.91	1.79	3.08	1.11
Cd [mg/L]	21-Apr-23	14:14	0.000070	0.000016	0.000014	< 0.000003
Co [mg/L]	21-Apr-23	14:14	0.00521	0.000569	0.00433	0.000475
Cr [mg/L]	21-Apr-23	14:14	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Cu [mg/L]	21-Apr-23	14:14	0.0105	0.0062	0.107	0.0031
Fe [mg/L]	21-Apr-23	14:14	0.183	0.034	0.546	0.014
K [mg/L]	21-Apr-23	14:14	0.102	0.044	0.071	0.041
Li [mg/L]	21-Apr-23	14:14	0.0002	0.0003	0.0004	0.0001
Mg [mg/L]	21-Apr-23	14:14	0.191	0.128	0.254	0.061
Mn [mg/L]	21-Apr-23	14:14	0.0439	0.125	0.0457	0.0117
Mo [mg/L]	21-Apr-23	14:14	0.00007	0.00007	0.00008	0.00006
Na [mg/L]	21-Apr-23	14:14	0.35	0.41	0.48	0.26
Ni [mg/L]	21-Apr-23	14:14	0.0027	0.0040	0.0042	0.0008
Pb [mg/L]	21-Apr-23	14:14	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	21-Apr-23	14:14	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	21-Apr-23	14:14	0.00014	0.00008	0.00020	0.00008
Sr [mg/L]	21-Apr-23	14:14	0.00252	0.00116	0.00623	0.00088
Sn [mg/L]	21-Apr-23	14:14	< 0.00006	< 0.00006	< 0.00006	< 0.00006

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

LR Report : **CA10068-APR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#8	6: B QTP-PAG-CO3DLP Wk#8	7: B LGO-PAG-CO3DP Wk#8	8: B HGO-PAG-Zn-CO3DP Wk#8
Ti [mg/L]	21-Apr-23	14:14	0.00007	< 0.00005	< 0.00005	< 0.00005
Tl [mg/L]	21-Apr-23	14:14	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	21-Apr-23	14:14	0.000039	0.000021	0.000126	0.000009
V [mg/L]	21-Apr-23	14:14	< 0.00001	< 0.00001	< 0.00001	< 0.00001
W [mg/L]	21-Apr-23	14:14	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Y [mg/L]	21-Apr-23	14:14	0.00019	< 0.00002	0.00186	< 0.00002
Zn [mg/L]	21-Apr-23	14:14	0.019	0.009	0.011	0.010

<original signed by>

Lisa Thompson
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Marathon - Berry Set 1

Project : Berry Project

28-April-2023

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Phone: 709-730-5046
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Date Rec. : 20 April 2023
LR Report: **CA10139-APR23**
Reference: Wk#18 - Marathon - Berry Set 1

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#18	6: B SED-High SFE Wk#18	7: B QTP-PAG Wk#18	8: B LGO-PAG Wk#18	9: B HGO-PAG-Zn Wk#18	10: B OB-ML Wk#18
Sample Date & Time			20-Apr-23	20-Apr-23	20-Apr-23	20-Apr-23	20-Apr-23	20-Apr-23
HumCell Leachate Vol [mL]	21-Apr-23	10:48	612	699	674	644	701	528
pH [No unit]	24-Apr-23	11:49	7.30	7.89	7.13	7.49	7.09	7.06
Acidity [mg/L as CaCO3]	21-Apr-23	11:06	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	21-Apr-23	11:06	7	13	6	10	5	8
Conductivity [uS/cm]	21-Apr-23	11:06	22	26	21	44	15	46
SO4 [mg/L]	27-Apr-23	16:19	2.8	1.1	3.1	11	1.3	10
F [mg/L]	21-Apr-23	09:21	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	22-Apr-23	12:14	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	25-Apr-23	14:56	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	25-Apr-23	14:56	0.033	0.041	0.018	0.019	0.017	0.160
As [mg/L]	25-Apr-23	14:56	< 0.0002	< 0.0002	0.0002	< 0.0002	< 0.0002	0.0018
Ba [mg/L]	25-Apr-23	14:56	0.00011	0.00122	0.00054	0.00055	0.00022	0.00534
Be [mg/L]	25-Apr-23	14:56	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	0.000007
B [mg/L]	25-Apr-23	14:56	< 0.002	< 0.002	0.004	0.006	0.002	< 0.002
Bi [mg/L]	25-Apr-23	14:56	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	25-Apr-23	14:56	4.15	4.20	3.68	7.01	2.70	8.14
Cd [mg/L]	25-Apr-23	14:56	0.000006	0.000014	0.000008	0.000013	0.000006	0.000017
Co [mg/L]	25-Apr-23	14:56	< 0.000004	< 0.000004	0.000009	0.000015	0.000008	0.000146
Cr [mg/L]	25-Apr-23	14:56	0.00051	0.00052	0.00048	0.00024	0.00043	0.00067
Cu [mg/L]	25-Apr-23	14:56	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0023
Fe [mg/L]	25-Apr-23	14:56	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	0.141
K [mg/L]	25-Apr-23	14:56	0.128	0.747	0.160	0.117	0.105	0.395
Li [mg/L]	25-Apr-23	14:56	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mg [mg/L]	25-Apr-23	14:56	0.130	0.381	0.128	0.212	0.098	0.409
Mn [mg/L]	25-Apr-23	14:56	0.0169	0.0249	0.0187	0.0344	0.0223	0.00861
Mo [mg/L]	25-Apr-23	14:56	0.00044	0.00794	0.00077	0.00121	0.00033	0.00400
Na [mg/L]	25-Apr-23	14:56	0.18	0.20	0.18	0.22	0.14	0.24
Ni [mg/L]	25-Apr-23	14:56	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0009
Pb [mg/L]	25-Apr-23	14:56	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	0.00015
Sb [mg/L]	25-Apr-23	14:56	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0012
Se [mg/L]	25-Apr-23	14:56	< 0.00004	< 0.00004	< 0.00004	0.00004	< 0.00004	0.00024
Sr [mg/L]	25-Apr-23	14:56	0.00261	0.0289	0.00701	0.00706	0.00574	0.0147

OnLine LIMS

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10139-APR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#18	6: B SED-High SFE Wk#18	7: B QTP-PAG Wk#18	8: B LGO-PAG Wk#18	9: B HGO-PAG-Zn Wk#18	10: B OB-ML Wk#18
Sn [mg/L]	25-Apr-23	14:56	0.00011	0.00015	0.00018	0.00008	0.00010	0.00023
Ti [mg/L]	25-Apr-23	14:56	0.00012	0.00019	< 0.00005	0.00005	< 0.00005	0.00611
Tl [mg/L]	25-Apr-23	14:56	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	25-Apr-23	14:56	0.000096	0.000887	0.000512	0.000369	0.000094	0.000216
V [mg/L]	25-Apr-23	14:56	0.00017	0.00048	0.00020	0.00015	0.00019	0.00165
W [mg/L]	25-Apr-23	14:56	0.00006	0.00008	0.00004	0.00008	0.00015	0.00010
Y [mg/L]	25-Apr-23	14:56	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	0.00011
Zn [mg/L]	25-Apr-23	14:56	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

<original signed by>

Lisa Thompson
Project Specialist Assistant,
Environment, Health & Safety

OnLine LIMS

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Marathon - Berry Set 2

Project : Berry Project

04-May-2023

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Date Rec. : 27 April 2023
LR Report: **CA10193-APR23**
Reference: Wk#18 - Marathon - Berry Set 2

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#18	6: B SED Wk#18	7: B MD Wk#18	8: B QTP Wk#18	9: B LGO Wk#18	10: B HGO Wk#18
Sample Date & Time			27-Apr-23	27-Apr-23	27-Apr-23	27-Apr-23	27-Apr-23	27-Apr-23
HumCell Leachate Vol [mL]	29-Apr-23	09:24	1000	993	998	997	997	994
pH [No unit]	03-May-23	13:05	7.50	7.59	7.46	7.38	7.29	7.33
Acidity [mg/L as CaCO3]	28-Apr-23	11:15	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	28-Apr-23	11:15	7	11	10	9	8	8
Conductivity [uS/cm]	28-Apr-23	11:15	18	23	21	17	21	16
SO4 [mg/L]	02-May-23	15:44	0.5	0.2	0.4	0.4	1.9	0.5
F [mg/L]	01-May-23	09:54	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	29-Apr-23	09:29	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	03-May-23	15:58	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	03-May-23	15:58	0.051	0.039	0.044	0.039	0.027	0.033
As [mg/L]	03-May-23	15:58	0.0003	0.0008	0.0006	< 0.0002	< 0.0002	< 0.0002
Ba [mg/L]	03-May-23	15:58	0.00033	0.00756	0.00051	0.00019	0.00058	0.00119
Be [mg/L]	03-May-23	15:58	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	03-May-23	15:58	< 0.002	< 0.002	< 0.002	0.002	0.005	0.003
Bi [mg/L]	03-May-23	15:58	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	03-May-23	15:58	3.23	3.81	3.89	3.16	3.91	2.93
Cd [mg/L]	03-May-23	15:58	0.000021	0.000004	< 0.000003	< 0.000003	< 0.000003	< 0.000003
Co [mg/L]	03-May-23	15:58	< 0.000004	< 0.000004	< 0.000004	< 0.000004	< 0.000004	< 0.000004
Cr [mg/L]	03-May-23	15:58	0.00009	0.00015	0.00014	< 0.00008	< 0.00008	0.00012
Cu [mg/L]	03-May-23	15:58	0.0002	0.0002	< 0.0002	0.0004	0.0002	0.0003
Fe [mg/L]	03-May-23	15:58	< 0.007	< 0.007	0.011	< 0.007	0.008	< 0.007
K [mg/L]	03-May-23	15:58	0.229	0.392	0.228	0.170	0.277	0.161
Li [mg/L]	03-May-23	15:58	0.0002	0.0004	0.0002	0.0001	0.0001	0.0002
Mg [mg/L]	03-May-23	15:58	0.139	0.346	0.279	0.171	0.160	0.093
Mn [mg/L]	03-May-23	15:58	0.0342	0.0356	0.0212	0.0372	0.0357	0.0296
Mo [mg/L]	03-May-23	15:58	0.00040	0.00022	0.00021	0.00396	0.00046	0.00013
Na [mg/L]	03-May-23	15:58	0.18	0.44	0.41	0.22	1.24	0.75
Ni [mg/L]	03-May-23	15:58	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Pb [mg/L]	03-May-23	15:58	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009
Sb [mg/L]	03-May-23	15:58	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
Se [mg/L]	03-May-23	15:58	< 0.00004	0.00008	0.00007	0.00007	0.00074	0.00038
Sr [mg/L]	03-May-23	15:58	0.00374	0.0303	0.0111	0.00701	0.00735	0.00503

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Marathon - Berry Set 2

Project : Berry Project

LR Report : **CA10193-APR23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#18	6: B SED Wk#18	7: B MD Wk#18	8: B QTP Wk#18	9: B LGO Wk#18	10: B HGO Wk#18
Sn [mg/L]	03-May-23	15:58	< 0.00006	0.00010	< 0.00006	< 0.00006	0.00007	< 0.00006
Ti [mg/L]	03-May-23	15:58	< 0.00005	< 0.00005	0.00042	0.00026	0.00008	< 0.00005
Tl [mg/L]	03-May-23	15:58	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	03-May-23	15:58	0.000424	0.000518	0.000143	0.000189	0.000578	0.00147
V [mg/L]	03-May-23	15:58	0.00011	0.00032	0.00834	0.00008	0.00010	0.00008
W [mg/L]	03-May-23	15:58	0.00003	0.00010	0.00006	0.00004	0.00005	< 0.00002
Y [mg/L]	03-May-23	15:58	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Zn [mg/L]	03-May-23	15:58	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

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Project Specialist Assistant,
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Marathon - Berry Set 1

Project : Berry Project

03-May-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 27 April 2023
LR Report: **CA10192-APR23**
Reference: Wk#19 - Marathon - Berry Set 1

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG Wk#19	6: B SED-High SFE Wk#19	7: B QTP-PAG Wk#19	8: B LGO-PAG Wk#19	9: B HGO-PAG-Zn Wk#19	10: B OB-ML Wk#19
Sample Date & Time			27-Apr-23	27-Apr-23	27-Apr-23	27-Apr-23	27-Apr-23	27-Apr-23
HumCell Leachate Vol [mL]	29-Apr-23	09:24	554	704	684	643	701	539
pH [No unit]	28-Apr-23	14:23	7.14	7.31	7.03	7.18	7.06	7.08
Conductivity [uS/cm]	28-Apr-23	14:23	27	30	20	54	22	43

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Marathon - Berry Set 1 NP Depleted Hum Cells

Project : Berry Project

08-May-2023

Marathon Gold Corp
Attn : James Powell

P.O. Box 4006, Pearlgate PO
Mt. Pearl, NL
A1N 0A1, Canada

Phone: 709-730-5046
Fax:

Date Rec. : 02 May 2023
LR Report: **CA10017-MAY23**
Reference: Wk#11 - Marathon - Berry Set 1 NP Depleted Hum Cells

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG-CO3DP Wk#11	6: B QTP-PAG-CO3DP Wk#11	7: B LGO-PAG-CO3DP Wk#11	8: B HGO-PAG-Zn-CO3DP Wk#11
Sample Date & Time			02-May-23	02-May-23	02-May-23	02-May-23
HumCell Leachate Vol [mL]	03-May-23	09:26	656	650	584	643
pH [No unit]	03-May-23	12:24	4.62	4.91	4.13	4.96
Conductivity [uS/cm]	04-May-23	12:44	28	23	79	11

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Marathon - Berry Set 2

Project : Berry Project

10-May-2023

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Phone: 709-730-5046
Fax:

Date Rec. : 04 May 2023
LR Report: **CA10042-MAY23**
Reference: Wk#19 - Marathon - Berry Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#19	6: B SED Wk#19	7: B MD Wk#19	8: B QTP Wk#19	9: B LGO Wk#19	10: B HGO Wk#19
Sample Date & Time			04-May-23	04-May-23	04-May-23	04-May-23	04-May-23	04-May-23
HumCell Leachate Vol [mL]	04-May-23	18:10	981	945	964	923	954	973
pH [No unit]	10-May-23	11:22	7.36	7.45	7.49	7.29	7.03	7.28
Conductivity [uS/cm]	09-May-23	10:56	18	19	22	15	16	21

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Marathon - Berry Set 1

Project : Berry Project

16-May-2023

Marathon Gold Corp
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Fax:

Date Rec. : 04 May 2023
LR Report: **CA10041-MAY23**
Reference: Wk#20 - Marathon - Berry Set 1

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG	6: B SED-High SFE Wk#20	7: B QTP-PAG Wk#20	8: B LGO-PAG Wk#20	9: B HGO-PAG-Zn Wk#20	10: B OB-ML Wk#20
Sample Date & Time			04-May-23	04-May-23	04-May-23	04-May-23	04-May-23	04-May-23
HumCell Leachate Vol [mL]	04-May-23	18:09	614	702	686	656	713	536
pH [No unit]	09-May-23	10:55	7.22	7.66	7.11	7.51	7.12	6.83
Acidity [mg/L as CaCO3]	09-May-23	10:55	< 2	< 2	< 2	< 2	< 2	< 2
Alkalinity [mg/L as CaCO3]	09-May-23	10:55	8	10	7	10	7	6
Conductivity [uS/cm]	09-May-23	10:55	24	26	22	39	18	39
SO4 [mg/L]	10-May-23	06:59	2.6	0.9	2.8	9.4	1.4	7.7
F [mg/L]	05-May-23	10:49	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Hg [mg/L]	09-May-23	09:56	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ag [mg/L]	11-May-23	13:54	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Al [mg/L]	11-May-23	13:54	0.007	0.039	0.015	0.023	0.020	0.081
As [mg/L]	11-May-23	13:54	< 0.0002	0.0012	0.0023	0.0005	0.0005	0.0023
Ba [mg/L]	11-May-23	13:54	0.00014	0.00121	0.00044	0.00025	0.00018	0.00370
Be [mg/L]	11-May-23	13:54	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007	< 0.000007
B [mg/L]	11-May-23	13:54	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bi [mg/L]	11-May-23	13:54	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ca [mg/L]	11-May-23	13:54	3.83	4.37	4.06	6.79	3.10	6.61
Cd [mg/L]	11-May-23	13:54	0.000006	0.000004	0.000003	< 0.000003	< 0.000003	0.000006
Co [mg/L]	11-May-23	13:54	0.000004	0.000039	0.000039	0.000009	0.000007	0.000141
Cr [mg/L]	11-May-23	13:54	< 0.00008	0.00018	0.00010	0.00012	0.00011	0.00030
Cu [mg/L]	11-May-23	13:54	< 0.0002	< 0.0002	< 0.0002	0.0003	< 0.0002	0.0024
Fe [mg/L]	11-May-23	13:54	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	0.100
K [mg/L]	11-May-23	13:54	0.095	0.679	0.151	0.092	0.089	0.328
Li [mg/L]	11-May-23	13:54	< 0.0001	0.0003	0.0003	0.0002	0.0002	0.0003
Mg [mg/L]	11-May-23	13:54	0.122	0.364	0.130	0.168	0.089	0.328
Mn [mg/L]	11-May-23	13:54	0.00781	0.0229	0.0233	0.0322	0.0257	0.00776
Mo [mg/L]	11-May-23	13:54	0.00099	0.00622	0.00180	0.00082	0.00096	0.00296
Na [mg/L]	11-May-23	13:54	0.18	0.16	0.14	0.13	0.12	0.16
Ni [mg/L]	11-May-23	13:54	0.0002	0.0002	0.0002	0.0002	< 0.0001	0.0005
Pb [mg/L]	11-May-23	13:54	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	0.00016
Sb [mg/L]	11-May-23	13:54	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009	0.0011
Se [mg/L]	11-May-23	13:54	0.00009	< 0.00004	< 0.00004	< 0.00004	< 0.00004	0.00017
Sr [mg/L]	11-May-23	13:54	0.00250	0.0288	0.00700	0.00623	0.00612	0.0122

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Marathon - Berry Set 1

Project : Berry Project

LR Report : **CA10041-MAY23**

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR-PAG	6: B SED-High SFE Wk#20	7: B QTP-PAG Wk#20	8: B LGO-PAG Wk#20	9: B HGO-PAG-Zn Wk#20	10: B OB-ML Wk#20
Sn [mg/L]	11-May-23	13:54	< 0.00006	0.00011	0.00024	< 0.00006	0.00011	0.00039
Ti [mg/L]	11-May-23	13:54	< 0.00005	0.00017	< 0.00005	< 0.00005	< 0.00005	0.00482
Tl [mg/L]	11-May-23	13:54	< 0.000005	< 0.000005	0.000016	< 0.000005	< 0.000005	< 0.000005
U [mg/L]	11-May-23	13:54	0.000037	0.00261	0.00365	0.000859	0.000174	0.000939
V [mg/L]	11-May-23	13:54	0.00004	0.00040	0.00007	0.00007	0.00008	0.00157
W [mg/L]	11-May-23	13:54	0.00011	0.00010	0.00010	0.00008	0.00013	0.00010
Y [mg/L]	11-May-23	13:54	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	0.00012
Zn [mg/L]	11-May-23	13:54	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

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Marathon - Berry Set 2

Project : Berry Project

17-May-2023

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Fax:

Date Rec. : 06 April 2023
LR Report: **CA10042-APR23**
Reference: Wk#15 - Marathon - Berry Set 2

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CERTIFICATE OF ANALYSIS
Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: B QPOR Wk#15	6: B SEDB Wk#15	7: MD Wk#15	8: B QTP Wk#15	9: B LGO Wk#15	10: B HGO Wk#15
Sample Date & Time			6-Apr-23	6-Apr-23	6-Apr-23	6-Apr-23	6-Apr-23	6-Apr-23
HumCell Leachate Vol [mL]	10-Apr-23	10:10	944	987	961	953	945	940
pH [No unit]	12-Apr-23	10:09	7.00	7.33	7.38	7.25	7.10	7.15
Conductivity [uS/cm]	12-Apr-23	10:09	17	21	25	17	15	19

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