Phase II Environmental Site Assessment

Former Silica Lake Mine

Castlereagh, Nova Scotia

Submitted to:
Build Nova Scotia
Habourside Place
PO Box 430, Sta. A
45 Wabana Court
Sydney/Puksetewe'katik, Nova Scotia
B1P 6H2

Prepared by:
Arcadis Canada Inc.
168 Hobsons Lake Drive, Suite 301
Halifax, Nova Scotia
B3S 0G4

Project No.: 30235902
Date: March 24, 2025

Phase II Environmental Site Assessment

Former Silica Lake Mine, Castlereagh, Nova Scotia

March 24, 2025

Prepared By:
Arcadis Canada Inc.
168 Hobsons Lake Dr, Suite 301
Halifax, Nova Scotia
B3S 0G4

Our Ref:
30235902

Prepared For:
Build Nova Scotia
Harbourside Place
PO Box 430, Sta. A
45 Wabana Court
Sydney/Puksetewe'katik, Nova Scotia
B1P 6H2

Randy Fancey, CET
Group Lead – Environment (Atlantic)

Scott Conrod, B.Sc., P.Geo., FGC
Vice President, Resilience Sales Director
Site Professional (APGNS #0056)

Table of Contents

Figures

Tables

Appendices

Acronyms and Abbreviations

AEC	Area of Environmental Concern
APEC	Area of Potential Environmental Concern
Arcadis	Arcadis Canada Inc.
AST	Above Ground Storage Tank
Atlantic RBCA	Atlantic Risk-Based Corrective Action
BV	Bureau Veritas
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CALA	Canadian Association for Laboratory Accreditation
COC	Contaminant of Concern
CSA	Canadian Standards Association
ESA	Environmental Site Assessment
FIP	Fire Insurance Plan
HASP	Health and Safety Plan
Km	kilometer
kg	kilogram
L	Liter
m	meter
mbgs	meters below ground surface
mbtoc	meters below top of casing
mg	milligrams
mg/kg	milligrams/kilogram
m/sec	meters/second
NSECC	Nova Scotia Environment and Climate Change
PAH	Polycyclic Aromatic Hydrocarbon
PID	Property Identification Number
QA	Quality Assurance
QC	Quality Control
RPD	Relative Precentage Difference
SCC	Standards Council of Canada
Site	Fomer Mill and Accessory Buildings Site
TPH	Total Peroleum Hydrocarbons
Tier I EQS	Tier I Environmental Quality Standards
UST	Underground Storage Tank

Executive Summary

Arcadis Canada Inc. (Arcadis) was retained by Build Nova Scotia (BNS), on behalf of Nova Scotia Department of Natural Resources and Renewables (NSDNRR), to conduct a Phase II Environmental Site Assessment (ESA) of the former Silica Lake mine site in Castlereagh, Nova Scotia, herein referred to as the "Site".

It is understood that BNS has a mandate to assess and where required remediate, redevelop and manage properties owned by the Province of Nova Scotia. This Phase II ESA was conducted as part of the larger mine environmental assessment program. The objective of this Phase II ESA was to assess potential soil, groundwater, surface water and sediment impacts at the Site that may have resulted from historical mining activities. It is noted that the scope of work for this Phase II ESA was to conduct an initial Phase II ESA at the Site. It was not the intent nor was it expected that the horizontal and/or vertical extent of contamination, if identified, would be delineated during this assessment.

The property (PID 20418240) where former mine operations took place is approximately 148.12 hectares (ha) in size, herein referred to as the "Property". The general area surrounding the Site is best described as a wooded mountainous area. Mining operations within the Property occurred at the former mill site (approximately 2.5 acres) and the former accessory buildings site (approximately 1.5 acres). The former mill site primarily consists of a wetland, which is located along the southeastern shore of Silica Lake. Bass River also flows through this site. The former accessory buildings site is an open field with bushes, alders and/or some trees. The Site is accessible by Silica Road and Old Castlereagh Road.

The former Silica Lake mine site was a historic diatomaceous earth mine which operated between 1889 and 1923. Large deposit of diatomaceous earth, commonly referred to as diatomite, was mined by the Oxford Tripoli Company at the Site. The lake was periodically dewatered, and diatomaceous earth was dredged and/or hand dug from the lake bottom. The material was subsequently dried and then calcined in a kiln to produce diatomite. The diatomite was then transported and stored in a warehouse in Bass River, before it was shipped by boat to its destination.

Arcadis conducted a Phase I ESA between August 2024 and March 2025. Areas of Potential Environmental Concern (APECs) and Potential Contaminants of Concern (PCOCs) were identified as follows:

APEC/location	PCOC(s)/Media
APEC 1: Former Mill Site located along the southeastern shore of Silica Lake.	• Metals and polycyclic aromatic hydrocarbons (PAHs) in soil associated with the waste ash from the kiln in the mill, and ash from the original mill that was destroyed by fire. • Metal (and general impacts) in groundwater, surface water and sediment associated with waste ash from the kiln in the mill ash from the original mill that was destroyed by fire, and past mill operations. • Petroleum hydrocarbons in surface soil associated with the use of gas/diesel for the dewatering pumps. • Potential asbestos at surface associated with the brick used in the kilns and/or in the grout.
APEC 2: Former Accessory Building Site located along the northeastern shore of Silica Lake.	• Metals and PAHs associated with the waste ash from the cooking/wood stoves in the accessory buildings.

This Phase II ESA was conducted in accordance with the Nova Scotia Environment and Climate Change (NSECC) Phase II Environmental Site Assessment Protocol (PRO-400). As requested by NSDNRR, the Site was

classified as “residential/parkland”. In accordance with the Contaminated Sites Protocols, the Site was also classified as “potable/coarse-grained”.

The scope of work for this Phase II ESA consisted of advancing six hand auger holes, installing three monitoring wells, collecting sixteen (16) soil samples (including a blind field duplicate sample), collecting four groundwater samples (including a blind field duplicate sample), collecting three sediment and surface water samples, and collecting nine asbestos samples. Soil, groundwater, sediment and surface water samples were submitted for general chemistry, metals and/or PAH analysis at an accredited laboratory. Nine asbestos samples were also collected and analyzed for asbestos content at an accredited laboratory.

The surficial geology at the former accessory buildings site, based on field observations, primarily consists of a silty sand to a gravelly sand. The surficial geology at the former mill site consists of an organic layer, silty sand, gravelly sand and then a sand. Bedrock in the vicinity of the Site is mapped as the Silica Lake Formation, which consists of green to maroon basaltic to rhyolitic flows and tuffs, locally porphyritic; minor conglomerate and sandstone. Bedrock was not encountered during the Phase II ESA.

The depth to groundwater ranged from 0.40 to 1.78 meters below ground surface based on recent groundwater data from newly installed monitoring wells in 2025 at the Site. Because MW1 and MW2 were installed on the west side of Bass River and MW3 was installed northeast of Bass River, the groundwater flow direction could not be calculated. The groundwater flow direction at the former accessory buildings site is assumed to be to the southwest, and the groundwater flow direction at the former mill site is assumed to be to the south to the southeast.

Based on the surficial geology at the site, the groundwater is an unconfined aquifer. The hydraulic conductivity at the site (for a coarse-grained soil, such as sand) is anticipated to range from 10^{-3} to 10^{-6} m/s. The groundwater velocity at the former mill site is anticipated to range between 0.0075 and 0.000015 m/s.

The following presents a summary of the analytical results:

- ***Soil Analytical Results:*** A total of sixteen (16) soil samples, including one blind field duplicate sample, were submitted for analysis.
  - Metals Background Soil Quality: Elevated aluminum, iron, manganese and vanadium concentrations are representative of natural background soil quality.
  - Metal Exceedances: Antimony, arsenic, barium, beryllium, copper, lead, selenium and/or zinc exceedances were detected in the soil samples MW2-01, HA2-2, HA2-3, HA3-1 and SS1.
  - PAH Exceedances: Benzo(b/j/k)fluoranthene concentrations exceeded the Tier I EQS for the soil samples MW2-01, HA1-3, HA2-2 and Dup A (a blind field duplicate of SS2).
  - Petroleum Hydrocarbons: BTEX/Modified TPH concentrations were either not detected or were below the Tier I EQS for the soil samples HA1-2 and HA2-2. However, the Modified TPH concentrations detected in soil samples HA1-2 and HA2-2 may indicate impacts in the groundwater at these locations.
- ***Groundwater Analytical Results:*** A total of four groundwater samples, including one blind field duplicate sample, were analyzed.
  - Metal Background Groundwater Quality: Elevated manganese concentrations are considered to be representative of natural background groundwater quality.
  - General Chemistry: There were no Tier I EQS exceedances in the analysed groundwater samples.
  - Metals: There were no Tier I EQS in the analysed in the groundwater samples (excluding the manganese exceedances).
- ***Sediment Analytical Results:*** A total of three sediment samples were analyzed.
  - General Chemistry: There are no Tier I EQS for general chemistry parameters in freshwater sediment. Therefore, there were no exceedances.

  - Metal Exceedances: Antimony, copper and lead concentrations in the sediment sample SED2 exceeded the Tier I EQS.
- ***Surface Water Analytical Results:*** A total of three surface water samples were analyzed.
  - General Chemistry Exceedances: The pH in the surface water sample SW1 exceeded the Tier I EQS.
  - Metal Exceedances: Aluminum, copper, iron, lead and/or zinc concentrations exceeded the Tier I EQS in the surface water samples SW1, SW2 and/or SW3.
- ***Asbestos Results:*** A total of nine samples were analyzed.
  - Asbestos: Asbestos was not detected in any of the analyzed samples.

Based on the analytical results, there were no Tier I EQS exceedances in soil at the former accessory buildings site. As such, no further assessment or remediation is recommended at this site. However, the metal and PAH exceedances in soil, sediment and surface water at the former mill site are consistent with and considered to be sourced from the former mill operations. The extent of contamination appears to be widespread at this site, with very little to no delineation achieved at the Phase II ESA sampling locations.

Based on the field observations and analytical exceedances identified during this Phase II ESA, the following recommendations are presented:

- Submit a Notification of Free Product or Contamination Form (FRM-100) in accordance with the Nova Scotia Environment and Climate Change Contaminated Sites Protocols, specifically the Notification of Contamination Protocol (PRO-100).
- Develop a proposal to conduct a Supplemental Phase II ESA and HHERA (including sampling plans).
- Conduct the Supplemental Phase II ESA and the HHERA sampling programs:
  - Delineate the horizontal and vertical extent of metal and PAH impacts in soil.
  - Delineate the horizontal extent of metal impacts in sediment. It is also recommended that sediment samples also be assessed for PAHs.
  - Collect groundwater samples from MW1 and MW2 for petroleum hydrocarbons, based on the Modified TPH concentrations detected in soil samples HA1-2 and HA2-2.
  - Collect confirmatory/additional surface water samples within and near the former mine site.
  - Collect a minimum of ten (10) reference sediment and surface water samples within the general area of the Site for metals and PAH analysis to support the HHERA.
  - Collect benthic invertebrate samples to support the HHERA.
  - Collect soil and sediment samples for pH analysis
- Prepare a Supplemental Phase II ESA Report
- Develop a Remedial Action Plan.
- Conduct a HHERA to evaluate the risks associated with the contamination at the Site and prepare a report. Given the site is predominantly a wetland, physical remediation (i.e., dig and dump) is not recommended.
- Develop a Risk Management Plan, if necessary.
- Submit the reports and supporting documents to NSECC for regulatory closure.
- Decommission the monitoring wells.

1 Introduction

Arcadis Canada Inc. (Arcadis) was retained by Build Nova Scotia (BNS), on behalf of Nova Scotia Department of Natural Resources and Renewables (NSDNRR), to conduct a Phase II Environmental Site Assessment (ESA) of the former Silica Lake mine site in Castlereagh, Nova Scotia (Figure 1).

It is noted that the scope of work for this Phase II ESA was to conduct an initial Phase II ESA at the Site. It was not the intent nor was it expected that the horizontal and/or vertical extent of contamination, if identified, would be delineated during this assessment. A Supplemental Phase II ESA will be required to fully delineate the horizontal and/or vertical extent of contamination to comply with the Nova Scotia Environment and Climate Change Contaminated Sites Protocol requirements.

The property (PID 20418240, GPS coordinates: 45°31'.23.91" N, 063°48'13.66" W) where the former mine operations took place is approximately 148.12 hectares (ha) in size, herein referred to as the "Property". Mining operations within the Property occurred at the former mill site (approximately 2.5 acres) and the former accessory buildings site (approximately 1.5 acres), herein collectively referred to as the "Site". The locations and approximate area of the former mill site and the former accessory buildings site are presented in Figures 2 and 3, respectively.

2 Project Objective

It is understood that BNS has a mandate to assess and where required remediate, redevelop and manage properties owned by the Province of Nova Scotia. This Phase II ESA was conducted as part of the larger mine environmental assessment program and the objective of this project was to assess potential soil, groundwater, surface water and sediment impacts at the Site that may have resulted from historical mining operations and/or activities.

The Phase II ESA was specifically conducted at the former mill site and the former accessory buildings site, within the larger property (Figures 4 and 5).

3 Site Description

3.1 Site Description

The Property (PID 20418240) where former mining operations took place is approximately 148.12 hectares (ha) in size and is primarily described as a wooded mountainous area. Silica Lake, a small portion of Bass River and two privately owned cabins are also located within the Property (Figure 3).

Silica Lake, which is an approximately 7.3 ha in area, is located in the southernmost portion of the property (Figure 2). Silica Lake is the headwaters of Bass River, which generally flows to the southeast and then to the south. Both Silica Lake and Bass River would be used for recreational fishing and/or boating. Bass River ultimately discharges into Cobequid Bay, which is located approximately 14.5 kilometers south of the Site. There is also a small pond within the Property, located approximately one hundred and fifty-five (155) meters (m) north of Silica Lake. The northeastern portion of the Property has been used for forestry operations (i.e., commercial logging). Silica Road and Old Castlereagh Road extend through the Property. Silica Road extends along the northeastern and the southeastern sides of Silica Lake.

Buildings and infrastructure associated with the former mining operations were located at two different areas within the Property, the former mill site (Figure 4) and the former accessory buildings site (Figure 5). The former mill site was located on the southeast side of Silica Lake. It is worth noting that there were two mills at this site. The first mill was destroyed by a fire in 1905, and a second mill was constructed in 1906 at the same general location. The accessory buildings site, located along the northeastern shore of Silica Lake, consisted of a cookhouse, a boarding house and a cottage/house. Currently there are no buildings on either the former mill site or the former accessory buildings site.

The former mill site primarily consists of a wetland with sparse alders and some small trees along the ATV trail, which extends through the site. Bass River flows through the site. There is beaver dam on Bass River, approximately 75 meters downstream from Silica Lake or approximately 32 m downstream of the bridge over Bass River (Figure 4). There is a moderate to significant amount of standing water upstream of the beaver dam. It is anticipated that the former mill site has standing surface water during the Spring, Fall and Winter, and that it may be dry during the Summer. Based on the historical photographs, the area where the mill was located was solid ground.

The former accessory buildings site is an open field with bushes, alders and/or some trees. Silica Road extends through this site. It is worth noting that there were several buildings at the former accessory buildings site post mining operations (visible in 1947 – 1967 historical aerial photographs). It is assumed these buildings were either cabins and/or buildings associated with logging operations in the area. None of these buildings exist today.

There are two small, leased parcels of land around Silica Lake within the Property. These leased parcels are occupied by two seasonal cabins: one along the northern shore of Silica Lake and one along the eastern shore of Silica Lake (Figure 3). Access to these cabins is from Silica Road and/or Old Castlereagh Road. Silica Road and Old Castlereagh Road are still in use. Although these roads are used for logging operations in the general area of the Site, these roads are also maintained and used by the ATV (All-Terrain Vehicles) Association of Nova Scotia.

The Site and the surrounding area are not serviced by a potable water supply and/or sanitary sewer collection system. There are no known private water supply wells within nine kilometers of the Site. There are no private wells on the two leased parcels along the northern and eastern shore of Silica Lake. Potable water is brought into the cabins during each trip.

3.2 Former Mining Operations

The former Silica Lake mine site was a historic diatomaceous earth mine which operated between 1889 and 1923. Large deposit of diatomaceous earth, commonly referred to as diatomite, was mined by the Oxford Tripoli Company at the Site.

Diamataceous earth is a silica-rich sedimentary material formed by the accumulation of the shells of microscopic, single-cell diatoms (class Bacillariophycaeae) over a long period of time. Silica is extracted from the water body by diatoms, which is then used to form a shell. When these diatoms die, they sink to the bottom of the lake and the silica shells accumulate as thick sediment beds over millions of years.

Mining operations at Silica Lake produced approximately 18,000 tonnes of diatomite between 1899 and 1923. The lake was periodically dewatered, and diatomaceous earth was dredged and/or hand dug from the lake bottom. The material was subsequently dried and then calcined in a kiln to produce diatomite. The diatomite was then transported and stored in a warehouse in Bass River, before it was shipped to its destination.

4 Background Information

Arcadis conducted a Phase I ESA between August 2024 and March 2025. Table 1 presents a summary of the on- and off-site Areas of Potential Environmental Concern (APECs) and Potential Contaminants of Concern (PCOCs) identified during the Phase I ESA.

Table 1. Summary of APECs and PCOCs

APEC(s)	Location	PCOC(s)	Media
APEC 1: Former Mill Site	Former Mill Site located along the southeastern shore of Silica Lake.	Metals and polycyclic aromatic hydrocarbons (PAHs) in soil associated with the waste ash from the kiln inside the mill, and ash from the original mill that was destroyed by fire.	Soil
		Metals and general chemistry in groundwater, surface water and sediment associated with waste ash from the kiln inside the mill, ash from the original mill that was destroyed by fire, and past mill operations.	Groundwater Surface Water Sediment
		Petroleum hydrocarbons in surface soil associated with the use of gas/diesel for the dewatering pumps.	Soil
		Potential asbestos associated with the brick and grout at surface from the kiln inside the mill.	Brick and Grout
APEC 2: Former Accessory Building Site	Former Accessory Buildings Site located along the northeastern shore of Silica Lake.	Metals and PAHs in soil associated with the waste ash from the cooking/wood stoves in the accessory buildings.	Soil

5 Conceptual Site Model

There were no Tier I Environmental Quality Standard (EQS) exceedances at the former accessory buildings site (discussed further in Section 9 Results). As such, no further assessment (including a Conceptual Site Model (CSM)) or remediation is recommended at this location.

Tier I EQS exceedances were identified at the former mill site in soil, sediment and surface water. The following CSM is specific to the former mill site.

5.1 Contamination Sources

Based on the Phase I ESA findings (Arcadis, March 2025), the sources of contaminants at the Site were identified as follows:

Metals and PAHs in Soil: Waste ash from the kiln inside the former mill, and ash from the original mill that was destroyed by fire.

Metals and General Chemistry in Sediment and Surface Water: Waste ash from the kiln inside the former mill, and ash from the original mill that was destroyed by fire.

Petroleum Hydrocarbons in Soil: Petroleum hydrocarbons in surface soil associated with the use of gas/diesel for the dewatering pumps.

Asbestos in the Brick and/or Grout: Potential asbestos associated with the brick and grout at surface from the kiln inside the mill.

5.2 Potential Receptors

The following presents a summary of potential human and ecological receptors that could be present at the former mill site. It is anticipated that the current site will remain as a wetland in the future.

5.2.1 Human Receptors

Human receptors at the site would include the owners and guests of the two cabins along the shore of Silica Lake.

Commercial workers, specifically commercial loggers, would also be considered potential occasional human receptors at the Site. It is noted that commercial logging would not be conducted within the Site, but that loggers could potentially travel through the Site. A construction worker could also potentially be a human receptor, if and/or when the trail and/or the bridge over Bass River is upgraded or replaced in the future.

Recreational ATV drivers and/or fishers could also visit and/or pass through the Site.

The former Site is generally described as a wetland and is remote. Because of the extent of the wetland (i.e., 75% or more), a building permit would not be approved to develop this portion of the property in the future. Therefore, residential, commercial and/or industrial workers inside a dwelling or building would not be considered as potential human receptors.

5.2.2 Ecological Receptors

Potential ecological receptors include terrestrial mammals, avian species, amphibians, reptiles, soil invertebrates and plants. Because Silica Lake borders the site and Bass River flows through the site, semiaquatic mammals (i.e., beavers and otters) and fish would also represent potential ecological receptors.

5.3 Potential Exposure Pathways

5.3.1 Human Exposure Pathways

Human receptors could potentially be exposed to contaminants in soil through direct contact (dermal contact and ingestion) and the inhalation of outdoor vapours. Human exposure to groundwater is limited to the inhalation of outdoor vapours sourced from groundwater, since groundwater at the site is not used for potable purposes. Human receptors, both on-site receptors (i.e., the cabin owners and their guests) and visiting recreational hikers/fishers could also potentially be exposed via ingestion or consumption of fish from Silica Lake and/or Bass River.

Recreational ATV riders can also be exposed through direct contact (dermal contact and ingestion) with impacted soil or dust that is disturbed when riding on the trail.

Construction workers could be exposed to impacted surface soil via dermal contact or particulate inhalation when the bridge and/or the ATV trail are replaced and/or upgraded. The construction worker could also be exposed to groundwater via dermal contact given the shallow depth to groundwater at the Site. Inhalation of vapours originating from soil and/or groundwater is also theoretically complete.

5.3.2 Ecological Exposure Pathways

Ecological receptors (mammals, avian species, amphibians, reptiles, and soil invertebrates) could be exposed to contaminants in soil at the site via incidental ingestion and dermal contact, and ingestion of vegetation and/or prey items.

Avian receptors could be exposed to contaminants present in soil, sediment and surface water via incidental ingestion and dermal contact, as well as ingestion of smaller prey items.

Aquatic receptors (i.e., aquatic plants, invertebrates, amphibians, birds and mammals) could potentially be exposed to contaminants via contaminated soil leaching to groundwater and groundwater migrating and discharging into Silica Lake and/or Bass River. Aquatic receptors could also be exposed to contaminants present in surface water via dermal contact and ingestion of smaller prey items.

Root uptake of contaminants present in groundwater is considered a complete exposure pathway given that the depth to groundwater was observed at 0.40 mbgs.

5.4 Conceptual Site Module Summary

Based on the CSM, there are potential human health and/or ecological risks associated with the metal and/or PAH exceedances in soil, sediment and surface water.

6 Objectives and Scope of Work

6.1 Objective

The objective of the Phase II ESA was to assess the potential environmental liabilities (specifically soil, groundwater, surface water and/or sediment contamination) at the Site that may have resulted from historic mining activities. The Phase II ESA was conducted in accordance with the Nova Scotia Environment and Climate Change (NSECC) Phase II Environmental Site Assessment Protocol (PRO-400).

6.2 Scope of Work

To meet the project objective, Arcadis conducted a Phase II ESA program to assess the potential sources of contamination identified in the Phase I ESA. The Phase II ESA consisted of the following scope of work (and sampling plan):

Former Mill Site

- Collected a surface soil sample (SS1) adjacent to the former mill site to assess the background surface soil quality for metals and PAHs.
- Collected three surface soil samples (SS2 to SS4) to assess the surface soil quality for metals and PAHs.
- Advanced three manually driven hand augers (HA1 to HA3) to assess the soil quality for metals, petroleum hydrocarbons and/or PAHs.
- Installed two monitoring wells (MW1 and MW2) within and/or immediately downgradient of the former mill to assess the soil quality for metals and PAHs.
- Collected two groundwater samples from the monitoring wells (MW1 and MW2) to assess the groundwater quality for general chemistry and metals.
- Collected three surface water and sediment samples (SW1/SED1 to SW3/SED3) to assess the surface water and sediment quality for general chemistry and metals.
- Surveyed the monitoring wells relative to each other to calculate relative groundwater elevations.
- Collected three samples of the red brick, the yellow brick (refractory brick) and grout (on the red brick) to assess the brick and grout for asbestos content.

Former Accessory Buildings Site

- Installed one monitoring well (MW3), upgradient of the former accessory buildings, to assess background soil quality for metals and PAHs.
- Advanced three hand auger holes (HA4 to HA6) to assess the soil quality for metals and PAHs.
- Collected a groundwater sample from the monitoring well (MW3) to assess the background groundwater quality for general chemistry and metals.
- Surveyed the monitoring well relative to the other monitor wells.

7 Environmental Quality Standards

7.1 Environmental Standards

The Nova Scotia Environment and Climate Change manage impacted sites in accordance with the Contaminated Sites Protocols. The following site-specific characteristics were relevant in the selection of the applicable standards. As previously indicated, Department of Natural Resources and Renewables requested the Site be classified as residential/parkland, which was used to assess the soil and groundwater quality at the Site.

1. **Residential/parkland land use:** The primary land use/activity is residential or recreational activity. This category assumes parkland can be a buffer between areas of human residency, and includes campgrounds, but does not include undeveloped wild lands such as national or provincial parks. The generic residential property assumed for this category is a typical detached, single-family home with a backyard where children, particularly toddlers, play. Parks may also serve as areas for children's play and other family activities and so are also included in this land use category.

2. **Potable groundwater:** In accordance with Section 6.2.5 Groundwater (Notification of Contamination Protocol (PRO-100)), "the Tier I EQS tables allow the distinction in groundwater use between potable and non-potable scenarios. This is done to protect groundwater for potential future use. Sites outside municipally serviced areas are considered as potable". The Site is therefore classified as a "potable" site.

3. **Coarse grained soils:** The surficial soil at the Site has been characterized predominantly as a silty sand to a gravelly sand (based on the monitoring well and hand auger logs). Based on this, the soil is classified as "coarse-grained".

Based on the above, the Site is classified as an "residential/parkland, potable, coarse-grained" site. The following environmental quality standards were used to assess the soil, groundwater, sediment and/or surface water quality:

- Tier I Environmental Quality Standards for Soil - All Land Uses; Potable Groundwater Condition (Table 1A: Residential/Parkland, Coarse).
- Tier I Environmental Quality Standards for Groundwater - All Land Uses; Potable Groundwater Condition (Table 4A: Residential/Parkland, Coarse)
- Tier I Environmental Quality Standards for Sediment (Table 2: Freshwater Sediment)
- Tier I Environmental Quality Standards for Surface Water (Table 3: Surface Water, Freshwater)

7.2 Asbestos Standard

Asbestos in Nova Scotia is managed in accordance with the Nova Scotia Department of Labour and Advanced Education's Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace (November 2013).

Asbestos containing material is defined as any material identified by an appropriate laboratory analytical method (e.g. EPA 600/R-93/116, NIOSH 9000, or NIOSH 9002) that contains at least 0.5% of any type of asbestos, and vermiculite that contains any amount of asbestos using EPA method 600/R-04/004 if other analytical methods do not identify the presence of asbestos.

8 Methodology

8.1 Utility Locates

Prior to any intrusive assessment activities, Arcadis submitted a request via Info-Excavate to identify and locate any underground utilities owned by Nova Scotia Power, Bell Aliant, East Link, Heritage Gas, etc., in the vicinity of the Site. The Info-Excavate certificate indicated that there were no underground utilities at the Site or in the vicinity of the proposed soil sample locations.

As documented in the Phase I ESA, there are no known underground utilities at the Site.

8.2 Advancing Hand Augers and Soil Sampling

8.2.1 Manual Hand Auger Holes

Three shallow (< 1.0 m) hand auger holes (HA1 to HA3) were manually advanced on January 14, 2025. Because the proposed locations were within a wetland area (with surface water at or near surface, saturated conditions, organic rich soil and alders), it was decided by Arcadis not to mobilize the drill rig into these locations and damage the wetland. These hand auger holes were advanced using a shovel and/or a stainless-steel pipe that was manually driven at each location until refusal. The depth of these auger holes ranged from 0.46 – 0.76 meters below ground surface (mbgs). The locations of the hand augers are presented in Figure 4.

While advancing each of the manual hand auger holes, the stratigraphy was continuously logged. Soil type, colour, moisture content, debris and any indication of impacts and/or free product using olfactory methods (i.e., visual staining or odour) was documented.

Soil samples were continuously collected when advancing these hand augers using a shovel, a stainless-steel pipe and/or a stainless-steel trowel. The shovel, pipe and/or trowel were cleaned with water and a mild environmentally friendly detergent between each soil sample to prevent any potential cross contamination between samples. A new pair of disposable nitrile gloves were worn when collecting each soil sample.

Soil samples were placed directly into clean laboratory supplied sample vials/jars. Shortly after being collected, the samples were placed in a cooler and kept on ice until they were delivered to the laboratory. A completed chain of custody form was submitted with the soil samples.

Once the desired depth or refusal was achieved and the soil samples were collected, the hand auger hole was backfilled with the original removed soil.

GPS coordinates were obtained for each of the manual auger hole locations.

8.2.2 Drill Hand Augers

Three shallow (< 1.2 m) hand auger holes (HA4 to HA6) were advanced on January 7, 2025, by Nova Drilling Inc. using a track mounted CME55 geotechnical/environmental drill rig. The depth of these hand auger holes ranged from 1.08 – 1.18 mbgs. The locations of the hand auger holes presented in Figure 5.

While advancing each of the hand auger holes, the stratigraphy was continuously logged. Soil type, colour, moisture content, debris and any indication of impacts and/or free product using olfactory methods (i.e., visual staining or odour) was documented.

Soil samples were continuously collected when advancing each of the hand auger holes using split spoons. The split spoons were cleaned with water and a mild environmentally friendly detergent to prevent any potential cross contamination between soil samples. A new pair of disposable nitrile gloves were worn when collecting each soil sample.

Soil samples were placed directly into clean laboratory supplied sample vials/jars. Shortly after being collected, the samples were placed in a cooler and kept on ice until they were delivered to the laboratory. A completed chain of custody form was submitted with the soil samples.

Once the desired depth was achieved and all the soil samples were collected, the auger hole was backfilled with the original drill cuttings. The backfill material was then compacted near the surface using the drill rig to reduce the potential of future settling in the auger hole.

GPS coordinates were obtained for each of the hand auger holes.

8.3 Installing Monitoring Wells and Soil Sampling

Three monitoring wells (MW1 to MW3) were installed on January 7, 2025, by Nova Drilling Inc. using a track mounted CME55 geotechnical/environmental drill rig. The depth of the monitoring wells ranged from approximately 2.8 and 3.0 m below ground surface. The locations of the monitoring wells are presented in Figures 4 and 5.

While advancing each of the auger holes for the monitoring wells, the stratigraphy was continuously logged. Soil type, colour, moisture content, debris and any indication of impacts and/or free product using olfactory methods (i.e., visual staining or odour) was documented.

Soil samples were continuously collected when drilling each of the monitoring wells using split spoons. The split spoons were cleaned with water and a mild environmentally friendly detergent between each soil sample to prevent any potential cross contamination between the soil samples. A new pair of disposable nitrile gloves were used to collect each soil sample.

Soil samples were placed directly into clean laboratory supplied sample vials/jars. Shortly after being collected, the soil samples were placed in a cooler and kept on ice until they were delivered to the laboratory. A completed chain of custody form was submitted to the laboratory with the soil samples.

The monitor wells were constructed using 50 mm diameter Schedule 40 PVC casing, screen and an end cap. The annulus between the screened PVC pipe and soil was backfilled with clean silica sand, up approximately 0.3 m above the screened PVC pipe. A bentonite seal was placed and hydrated to provide a watertight seal for the well. The monitor wells were then secured with a compression plug and a bolt down, flush-mounted steel cover.

GPS coordinates were obtained for each monitoring well location. The monitoring wells were also surveyed using a standard level and rod to calculate relative monitoring well and groundwater elevations.

8.4 Surface Soil Sampling

Surface soil samples (SS1 to SS4) were collected using a pick, shovel and a stainless-steel trowel. It is noted that SS1 was collected as a background location for the former mine site. The surface soil samples were collected from depths ranging between 0.15 to 0.50 mbgs. A new pair of disposable nitrile gloves were used to collect each surface

soil sample. The soil type, colour, moisture content, debris and any indication of impacts and/or free product using olfactory methods (i.e., visual staining or odour) was documented.

The surface soil samples were placed directly in clean laboratory supplied sample vials/bottles. Shortly after being collected, the soil samples were placed in a cooler and kept on ice until delivered to the laboratory. A completed chain of custody form was submitted to the laboratory with the soil samples.

The pick, shovel and stainless-steel trowel were cleaned with water and a mild environmentally friendly detergent.

GPS coordinates were obtained for each surface soil sample location.

8.5 Sediment Sampling

Sediment samples (SED1 to SED3) were collected from the former mill site using a shovel and a stainless-steel trowel. The sediment samples were collected from surface to a depth of approximately 0.15 m. A new pair of disposable nitrile gloves were used to collect each sediment sample. The sediment type, colour and any indication of debris or impacts using olfactory methods (i.e., visible debris, visual staining or odour) was documented.

The sediment samples were placed in clean laboratory supplied bottles. Shortly after being collected, the sediment samples were placed in a cooler and kept on ice until delivered to the laboratory. A completed chain of custody was submitted to the laboratory with the sediment samples.

The shovel and stainless-steel trowel were cleaned between each sample with water and a mild environmentally friendly detergent.

GPS coordinates were obtained for each sediment sample location.

8.6 Surface Water Sampling

Surface water samples (SW1 to SW3) were collected from the former mill site. Two surface water samples were collected from Silica Lake (SW1 and SW2) and one surface water sample was collected from Bass River (SW3). The surface water samples were collected directly from the surface water body in clean laboratory supplied sample bottles. Where practical, the surface water samples were collected approximately one half of the height of the water column at the sample location. A new pair of disposable nitrile gloves were worn when collecting each surface water sample.

The surface water samples were placed in clean laboratory supplied bottles. Shortly after being collected, the surface water samples were placed in a cooler and kept on ice until delivered to the laboratory. A completed chain of custody was submitted to the laboratory with the surface water samples.

GPS coordinates were obtained for each surface water sample location.

8.7 Groundwater Sampling

The monitoring wells, after installation, were allowed to stabilize for seven days.

Prior to sampling, the depth to groundwater was measured in each of the monitoring wells using an interface probe, which is capable of distinguishing between water and phased separated petroleum hydrocarbon (if present).

Each monitoring well was purged using a disposable bailer, removing a minimum of three well volumes of groundwater or the well was purged dry on three occasions. The water level in the monitoring well was allowed to recover to within 80% of its original static level before groundwater samples were collected.

The groundwater samples were placed in clean laboratory supplied sample vials/containers. Shortly after being collected, the groundwater samples were placed in coolers and kept on ice until delivered to the laboratory. A completed chain of custody was submitted to the laboratory with the groundwater samples.

A new pair of disposable nitrile gloves were used when purging and/or sampling each of the monitoring wells.

8.8 Asbestos Sampling

Bulk asbestos samples were collected of the red brick, the yellow (or beige) refractory brick and the grout that was attached to the red brick. Three samples of each brick type and three samples of the grout were collected and placed in heavy duty Ziplock bags. A new pair of disposable nitrile gloves were worn when collecting each sample. The samples were submitted to EMSL Canada Inc. for asbestos content, specifically PLM (Polarized Light Microscopy) analysis, with a positive stop. A completed chain of custody form was submitted with the samples.

8.9 Laboratory Analysis

Environmental samples (i.e., soil, groundwater, surface water and/or sediment) were labelled and kept cool on ice until delivered to Bureau Veritas (BV) in Bedford, Nova Scotia. A complete chain of custody form was submitted with each batch of samples. BV is accredited by the Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) to conduct the analysis required for the Phase II ESA.

The asbestos samples were submitted to EMSL Canada Inc. (EMSL) in Mississauga, Ontario for asbestos content, specifically PLM (Polarized Light Microscopy) analysis, with a positive stop. A completed chain of custody form was submitted with the samples. EMSL holds a current Certificate of Accreditation for Bulk Asbestos Fibre Analysis under the Voluntary Accreditation Program (NVLAP).

8.10 Elevational Survey

An elevation survey was conducted for the monitoring wells using a standard level and rod. Both the ground surface and the top of the monitoring wells were surveyed relative to each other.

9 Results

9.1 Field Observations

There were no obvious indications of petroleum hydrocarbon impacts (i.e., visible staining or odour) at the various soil sample locations along Silica Lake.

There were no obvious indications of metal and/or PAH impacts (i.e., visible staining or odour) when installing the monitoring wells, advancing the auger holes or when collecting the surface soil samples.

Some white material on the bottom and a white/reddish brown/gray sediment (possible ash material) was observed where Silica Lake discharges into Bass River (see Photographs 9 and 10, Appendix A).

A pile of brick was observed within the footprint of the former mill and along the trail. Although there were larger pieces of brick in the trail, there was also smaller pieces. Pieces of brick were observed within Bass River. Several pieces of brick were also observed when advancing HA2, at a depth of approximately 0.15 – 0.30 m.

9.2 Site Geology

The surficial geology in the vicinity of the site is mapped as one of three different surficial deposits, which are described as follows:

Apple River Member (Nonglacial and Glacial Environments): ice contact stratified drift, boulders, gravelly sand, sand and silt, abrupt changes in grain sizes between beds, faulting common, till may be included locally; forms hummocky and kettle terrain, terraces along valley sides, 4 – 30 m thick.

Alluvial Deposits (Nonglacial Environment): gravel sand, silt, minor clay and organic material; forms flood plains, channel and bank deposits, 2-25 m thick.

Eatonville-Hants Till (Glacial Environment): reddish-brown silty sand till, moderately compact to compact, fissile and massive, jointed, MnO_2 staining along fissility planes; clast lithology; generally > 50% Carboniferous sedimentary rocks with increasing percentages of igneous and metamorphic lithologies east of Springhill and southward onto the Cobequid Highlands; surface boulder layer in these regions is usually enriched in Highland lithologies; forms fluted, drumlinized and rolling ground moraine, 1-15 m thick.

The Apple River Member is generally located to the north, northeast, southwest and west of Silica Lake; the Alluvial Deposits are located along the southeastern side of Silica Lake; and the Eatonville-Hants Till is located to the southeast and south of Silica Lake, beyond the Alluvial Deposits.

The surficial geology at the former accessory buildings site, based on field observations, primarily consists of a silty sand to a gravelly sand. The surficial geology at the former mill site consists of an organic layer, silty sand and then a clayey fine silt. Soil at the site is considered coarse grained.

Bedrock in the vicinity of the Site is mapped as the Silica Lake Formation, which consists of green to maroon basaltic to rhyolitic flows and tuffs, locally porphyritic; minor conglomerate and sandstone (McHattie, T., et all. 2013). Bedrock was not encountered during the Phase II ESA.

9.3 Site Hydrogeology

Two monitoring wells were installed at the former mill site and one monitoring well was installed at the former accessory buildings site. Because these two sites are separated by Bass River, which acts as a hydraulic divide between the two sites, it is not possible to calculate a groundwater flow direction using the three monitoring wells.

Based on the surficial geology at the site, the groundwater is an unconfined aquifer (a silty sand to a sand). The soil is considered coarse grained soil.

The depth to groundwater in MW1 and MW2 at the former mill site were 0.41 and 0.40 meters below top of casing (mbtoc) respectively, both with a relative groundwater elevation of 99.59 m. The groundwater flow direction at this site is anticipated to be to the south to southeast (Figure 4).

The depth to groundwater at the former accessory building site in MW3 was 1.78 mbtoc, with a relative groundwater elevation of 100.27 m. The groundwater flow direction at this site is anticipated to be to the southwest (Figure 5).

The depth to groundwater measurements and the relative groundwater elevations are presented in Table 1.

The estimated groundwater velocity (for the former mill site) was calculated using the formula:

V = kI/n
V = Velocity (m/s)
k = Horizontal hydraulic conductivity (m/s)
I = hydraulic gradient
n= effective porosity

The values used in the above equation were as follows:

Hydraulic Conductivity: Based on the soil type and observations when developing and sampling the monitoring wells, the hydraulic conductivity at the site (for a coarse-grained soil, such as sand) is anticipated to range from 10^{-3} to 10^{-6} m/s.

Hydraulic Gradient: The groundwater gradient at the former mill site could not be calculated. The relative groundwater elevations for both MW1 and MW2 were 99.59 m (Table 1). Given the standing water throughout the former mill site, and the presence of the downstream beaver dam, the groundwater gradient of 1 (or very close to 1) would be representative.

Effective Porosity: The effective porosity in the water bearing unit (coarse grained soils): 0.4

$V = (10^{-3}$ m/s) 1/0.4
$V = 0.0075$ m/s

$V = (10^{-6}$ m/s) 1/0.4
$V = 0.000015$ m/s

Based on the above, the groundwater velocity at the former mill site is anticipated to range between 0.0075 and 0.000015 m/s. This was consistent with field observations whereby, MW1 could be bailed dry and MW2 could not be bailed dry.

9.4 Free Product

There was no evidence of free product (i.e., visible product or strong petroleum hydrocarbon odour) in the soil when advancing the auger holes or when installing the monitoring wells. Free product was not measured in the monitoring wells.

9.5 Underground Utilities or Preferential Pathways

There are no known underground utilities at the Site. Similarly, there are no preferential pathways for groundwater at the Site.

9.6 Analytical Soil Results

A total of sixteen (16) soil samples, including one blind field duplicate (Dup A, a blind field duplicate sample of SS2), were submitted for metals, PAHs and/or petroleum hydrocarbon analysis. The analytical results are presented in Tables 2 to 4. The analytical certificates are presented in Appendix B, for reference.

9.6.1 Metals

Before evaluating the analytical metal results in soil, it is important to establish background soil quality for metals at the Site.

Aluminum, iron, manganese and vanadium concentrations exceeded the Tier I EQS in the four analyzed soil samples from the former accessory buildings site. These same parameters also had concentrations that exceeded the Tier I EQS in several to most of the soil samples analyzed from the former mill site.

Based on historical photographs, the surface soil around the former mill site appeared to be solid soil and comparable to the soil conditions at the former accessory buildings site. The current surface soil conditions at the former mill site are predominantly a wetland, which is generally level with the water level in Silica Lake. Some of the soil around the mill appears to have eroded away, likely due to seasonal flooding and erosion since the mill closed 100+ years ago. It is also anticipated that the beaver dam located downstream of Silica Lake would have also contributed to flooding and erosion, as well as possible soil removal for the construction of the beaver dam. It is also noted that the organic rich soil that currently covers most of the site, would have a different metal composition. Because of these considerations, less consistent aluminum, iron, manganese and vanadium exceedances in soil at the former mill site, when compared to the exceedances at the former accessory buildings site, would be anticipated.

Based on the above, the aluminum, iron, manganese and vanadium exceedances in soil are naturally occurring and representative of background soil quality at the Site.

The complete analytical metal results in soil are presented in Table 2.

Former Mine Site

Antimony, arsenic, barium, beryllium, copper, lead, selenium and/or zinc exceedances were detected in the soil samples MW2-01, HA2-2, HA2-3, HA3-1 and SS1 (the background sample location). Metal exceedances were not detected in the soil samples from MW1-02, HA1-2, HA1-3, SS2, SS3, SS4 and DUP-A (excluding the elevated background concentrations). The complete analytical results are presented in Table 2. Metal exceedances are presented on Figure 6.

Former Accessory Buildings Site

The metal concentrations in the soil samples analyzed from the former accessory buildings site were below the Tier I EQS (excluding the elevated background concentrations). The complete analytical results are presented in Table 2.

9.6.2 Petroleum Hydrocarbons

Former Mill Site

Benzene, toluene, ethylbenzene and xylenes (collectively referred to as BTEX) concentrations were not detected in the analyzed soil samples HA1-2 and HA2-2. Modified Total Petroleum Hydrocarbon (TPH) concentrations of 71 and 110 mg/kg (both represented as a lube oil by the laboratory) were detected in the soil samples HA1-2 and HA2-2, respectively. However, these Modified TPH concentrations are below the Tier I EQS. The analytical results are presented in Table 3.

It is worth noting that Arcadis requested Bureau Veritas conduct silica gel clean up on the total extractable hydrocarbon (Modified TPH) portions of the samples because of the high organic content in these samples. The presence of organic matter in soil samples may provide a false positive during laboratory analysis. The use of silica

gel clean up in the laboratory process helps to eliminate natural organic material and provide the anthropogenic (man made) petroleum hydrocarbon values in the environment.

9.6.3 Polycyclic Aromatic Hydrocarbons

Former Mine Site

Benzo(b,j,k)fluoranthene concentrations exceeded the Tier I EQS for the soil samples MW2-01, HA1-3, HA2-2 and Dup A (a blind field duplicate of SS2). The Index of Additive Cancer Risk (IACR) values exceeded the Tier I EQS for the soil samples MW1-02, MW2-01, HA1-2, HA1-3, HA2-2, HA2-3, SS3, SS4 and DUP-A. PAH concentrations in the other analyzed soil samples were below the Tier I EQS. The complete analytical results are presented in Table 4. PAH exceedances are presented on Figure 7.

Former Accessory Buildings Site

PAH concentrations in the analyzed soil samples from the former accessory buildings site (MW3-2, HA4-2, HA5-1 and HA6-2) were not detected or were below the Tier I EQS. The complete analytical results are in Table 4.

9.7 Analytical Groundwater Results

9.7.1 General Chemistry

The only Tier I EQS for general chemistry parameters in groundwater at a residential/parkland site is chloride. The chloride concentrations in the analysed groundwater samples are below the Tier I EQS. The complete analytical results are presented in Table 5.

9.7.2 Metals

Before evaluating the metal results in groundwater, it is important to establish background groundwater quality for metals at the Site.

Manganese concentrations exceeded the Tier I EQS in the four analyzed groundwater samples. The consistent range of the manganese concentrations in groundwater at the former mill site (1,100 to 1,300 ug/L) suggests the elevated concentrations, which exceed the Tier I EQS, are representative of background conditions. This is further supported by the fact that elevated manganese concentrations were also detected in the soil samples, which were representative of natural background soil quality. Elevated manganese concentrations are common throughout Nova Scotia and are widely accepted as natural background conditions. Based on these considerations, the elevated manganese concentrations in groundwater are representative of the background groundwater quality at the Site.

The other metal concentrations detected in the analysed groundwater samples are below the Tier I EQS. The complete analytical results are presented in Table 6.

9.8 Analytical Sediment Results

9.8.1 General Chemistry

There are no Tier I EQS for general chemistry parameters in sediment. The complete analytical sediment results are presented in Table 7.

9.8.2 Metals

The metal concentrations in the sediment samples SED1 and SED3 were below the Tier I EQS. However, the antimony, copper and lead concentrations in the sediment sample SED2 exceeded the Tier I EQS. The complete analytical sediment results are presented in Table 8. Metal exceedances are presented on Figure 8.

9.9 Analytical Surface Water Results

9.9.1 General Chemistry

The only general chemistry parameters that have Tier I EQS in surface water are chloride, nitrate, nitrite and pH. The pH in the surface water sample SW1 exceeded the Tier I EQS. The other general chemistry concentrations in SW1, including the general chemistry concentrations in the surface water samples SW2 and SW3 were below the Tier I EQS. The complete analytical results are presented in Table 9.

9.9.2 Metals

Aluminum, copper, iron, lead and/or zinc concentrations exceeded the Tier I EQS in the surface water samples SW1, SW2 and/or SW3. The complete analytical surface water results are presented in Table 10. Metal exceedances are presented on Figure 9.

9.10 Asbestos Results

Asbestos was not detected in the analyzed brick and grout samples. The asbestos results are presented in Table 11.

9.11 Interpretations of Results

The above elevated metal and PAH impacts are consistent with and are sourced from the former mill operations at the site. Metals and PAHs associated with ash generated from the combustion of wood is well documented. The consistent metal exceedances (i.e., antimony, copper and/or lead) in soil, sediment and surface water suggests that these metal impacts are all sourced from the former mill operations.

The horizontal extent of contamination appears to be widespread at the site, with very little to no delineation achieved at the Phase II ESA sampling locations. For this reason, figures showing the horizontal extent of impacts have not been included in this report. Figures showing horizontal delineation will be included as part of the Supplemental Phase II ESA Report to comply with the NSECC Contaminated Sites Protocols.

The Modified TPH concentrations detected in soil samples HA1-2 and HA2-2 may indicate impacts in the groundwater at these locations. MW1 and MW2 are near and downgradient of HA1-2 and HA2-2 soil sample locations. It is recommended that MW1 and MW2 be sampled for petroleum hydrocarbons.

Because the impacts have not been horizontally delineated, Arcadis cannot comment on whether or not impacts have migrated off-site, or the likelihood that impacts have migrated downgradient of the Site.

9.12 Quality Assurance and Quality Control

A QA/QC program was implemented to reduce and quantify potential issues introduced during sample collection, handling, shipping, and analysis. The program included, but was not limited to, using dedicated sampling equipment, using sample specific identification and labelling procedures, and using chain of custody records.

The laboratory QA/QC data and comments are presented with the laboratory certificates of analysis in Appendix C. The analyses included instrument and extraction surrogate recovery, method blanks, matrix duplicates, matrix spikes, and laboratory control samples. The laboratory QA/QC results were within acceptance limits.

As part of the field QC program, one blind field duplicate soil sample and one blind field duplicate groundwater sample were submitted for analysis. Relative percentage difference (RPD) values were calculated for the original and the blind field duplicate samples, which were compared to industry standard QA/QC limits. Although there were a few QA/QC violations, the overall analytical data was within QA/QC limits and are representative. The results of the field QA/QC sample analyses are presented in the Tables D1, D2, D3 and D4, Appendix D.

A detailed discussion of QA/QC results is provided in Table D5, Appendix D. Overall, laboratory and field QC results confirm that sample handling and analytical protocols were acceptable, and the analytical results are representative.

10 Conclusions

The results of the Phase II ESA are summarized as follows:

- The surficial geology at the former accessory buildings site, based on field observations, primarily consists of a silty sand to a gravelly sand. The surficial geology at the former mill site consists of an organic layer, silty sand and then a clayey fine silt. The soil at the property is considered coarse grained.
- Bedrock in the vicinity of the Site is mapped as the Silica Lake Formation, which consists of green to maroon basaltic to rhyolitic flows and tuffs, locally porphyritic; minor conglomerate and sandstone. Bedrock was not encountered during the Phase II ESA.
- The depth to groundwater ranged from 0.40 to 1.78 mbgs. Because MW1 and MW2 were installed on the west side of Bass River and MW3 was installed on the northeastern side of Bass River, the groundwater flow direction could not be calculated. The groundwater flow direction at the former accessory building site is assumed to be to the southwest, and the groundwater flow direction at the former mill site is assumed to be to the southeast to the south.
- Based on the surficial geology at the site, the groundwater is an unconfined aquifer. The hydraulic conductivity at the site (for a coarse-grained soil, such as sand) is anticipated to range from 10^{-3} to 10^{-6} m/s. The groundwater velocity at the former mill site is anticipated to range between 0.0075 and 0.000015 m/s.
- ***Soil Analytical Results:*** A total of sixteen (16) soil samples, including one blind filed duplicate sample, were submitted for analysis.
    - Metals Background Soil Quality: Elevated aluminum, iron, manganese and vanadium concentrations are representative of natural background soil quality.

  - Metal Exceedances: Antimony, arsenic, barium, beryllium, copper, lead, selenium and/or zinc exceedances were detected in the soil samples MW2-01, HA2-2, HA2-3, HA3-1 and SS1.
  - PAH Exceedances: Benzo(b/j/k)fluoranthene concentrations exceeded the Tier I EQS for the soil samples MW2-01, HA1-3, HA2-2 and Dup A (a blind field duplicate of SS2).
  - Petroleum Hydrocarbons: BTEX/Modified TPH concentrations were either not detected or were below the Tier I EQS for the soil samples HA1-2 and HA2-2. However, the Modified TPH concentrations detected in soil samples may indicate impacts in the groundwater at these locations.
- ***Groundwater Analytical Results:*** A total of four groundwater samples, including one blind field duplicate sample, were analyzed.
  - Metal Background Groundwater Quality: Elevated manganese concentrations are representative of natural background groundwater quality.
  - General Chemistry: There were no Tier I EQS exceedances in the analysed groundwater samples.
  - Metals: There were no Tier I EQS in the analysed groundwater samples (excluding the manganese exceedances).
- ***Sediment Analytical Results:*** A total of three sediment samples were analyzed.
  - General Chemistry: There are no Tier I EQS for general chemistry parameters in freshwater sediment. Therefore, there were no exceedances.
  - Metal Exceedances: Antimony, copper and lead concentrations in the sediment sample SED2 exceeded the Tier I EQS.
- ***Surface Water Analytical Results:*** A total of three surface water samples were analyzed.
  - General Chemistry Exceedances: The pH in the surface water sample SW1 exceeded the Tier I EQS.
  - Metal Exceedances: Aluminum, copper, iron, lead and/or zinc concentrations exceeded the Tier I EQS in the surface water samples SW1, SW2 and/or SW3.
- ***Asbestos Results:*** A total of nine samples were analyzed.
  - Asbestos: Asbestos was not detected in any of the analyzed samples.

Based on the analytical results, there were no Tier I EQS exceedances at the former accessory buildings site. As such, no further assessment and/or remediation is recommended at this site. However, metal and PAH exceedances in soil, sediment and surface water at the former mill site are consistent with and considered to be sourced from the former mill operations. The extent of contamination generally appears to be widespread at this site, with very little to no delineation achieved at the Phase II ESA sampling locations.

11 Recommendations

Based on the field observations and analytical exceedances identified as part of this Phase II ESA, the following recommendations are presented:

- Submit a Notification of Free Product or Contamination Form (FRM-100) in accordance with the Nova Scotia Environment and Climate Change Contaminated Sites Protocols, specifically the Notification of Contamination Protocol (PRO-100).
- Develop a proposal to conduct a Supplemental Phase II ESA and HHERA (including sampling plans).
- Conduct the Supplemental Phase II ESA and the HHERA sampling programs:
  - Delineate the horizontal and vertical extent of metal and PAH impacts in soil.
  - Delineate the horizontal extent of metal impacts in sediment. It is also recommended that sediment samples also be assessed for PAHs.
  - Collect groundwater samples from MW1 and MW2 for petroleum hydrocarbons, based on the Modified TPH concentrations detected in soil samples HA1-2 and HA2-2.
  - Collect confirmatory/additional surface water samples within and near the former mine site.

  - Collect a minimum of ten (10) reference sediment and surface water samples within the general area of the Site for metals and PAH analysis to support the HHERA.
  - Collect benthic invertebrate samples to support the HHERA.
  - Collect soil and sediment samples for pH analysis
- Prepare a Supplemental Phase II ESA Report
- Develop a Remedial Action Plan.
- Conduct a HHERA to evaluate the risks associated with the contamination at the Site and prepare a report. Given the site is predominantly a wetland, physical remediation (i.e., dig and dump) is not recommended.
- Develop a Risk Management Plan, if necessary.
- Submit the reports and supporting documents to NSECC for regulatory closure.
- Decommission the monitoring wells.

12 Limitations

This report was prepared by Arcadis Canada Inc. (Arcadis) exclusively for the account of Build Nova Scotia (the CLIENT). Other than the CLIENT, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of Arcadis. Any use, reliance on or decision made by any person other than the CLIENT based on this report is the sole responsibility of such other person. The CLIENT and Arcadis make no representation or warranty to any other person with regard to this report and the work referred to in this report and the CLIENT and Arcadis accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

Achieving the study objectives stated in this report has required Arcadis to arrive at conclusions based on the information presently known to Arcadis. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce this possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained. Professional judgment was also exercised in the formulation of recommendations. Like all professional persons rendering advice, we cannot act as absolute insurers of the conclusions we reach. We perform our work, within the limits prescribed by our client, with the usual thoroughness and competence of our profession. No other warranty or representation, expressed or implied, is included or intended in this report.

Third party information reviewed and used to formulate this report is assumed to be complete and correct. This information, to the extent it was relied on to form our opinion was reviewed and evaluated for thoroughness and reliability; however, Arcadis did not independently verify the information. Arcadis used this information in good faith and will not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.

The conclusions presented represent the best judgment of the assessors based on current environmental standards and on the site, conditions observed on the date of Arcadis' site visit. Due to the nature of the investigation and the limited data available, the assessors cannot warrant against undiscovered environmental liabilities. Nothing in this report is intended to constitute or provide a legal opinion. Should additional information become available, Arcadis requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

13 References

Arcadis Canada Inc. 2025. Phase I Environmental Site Assessment, Former Silica Lake Mine, Castlereagh, Nova Scotia.

Build Nova Scotia. 2024. Request For Quotation, Former Silica Lake Mine Site Phase I/II ESA, Site Visit Report.

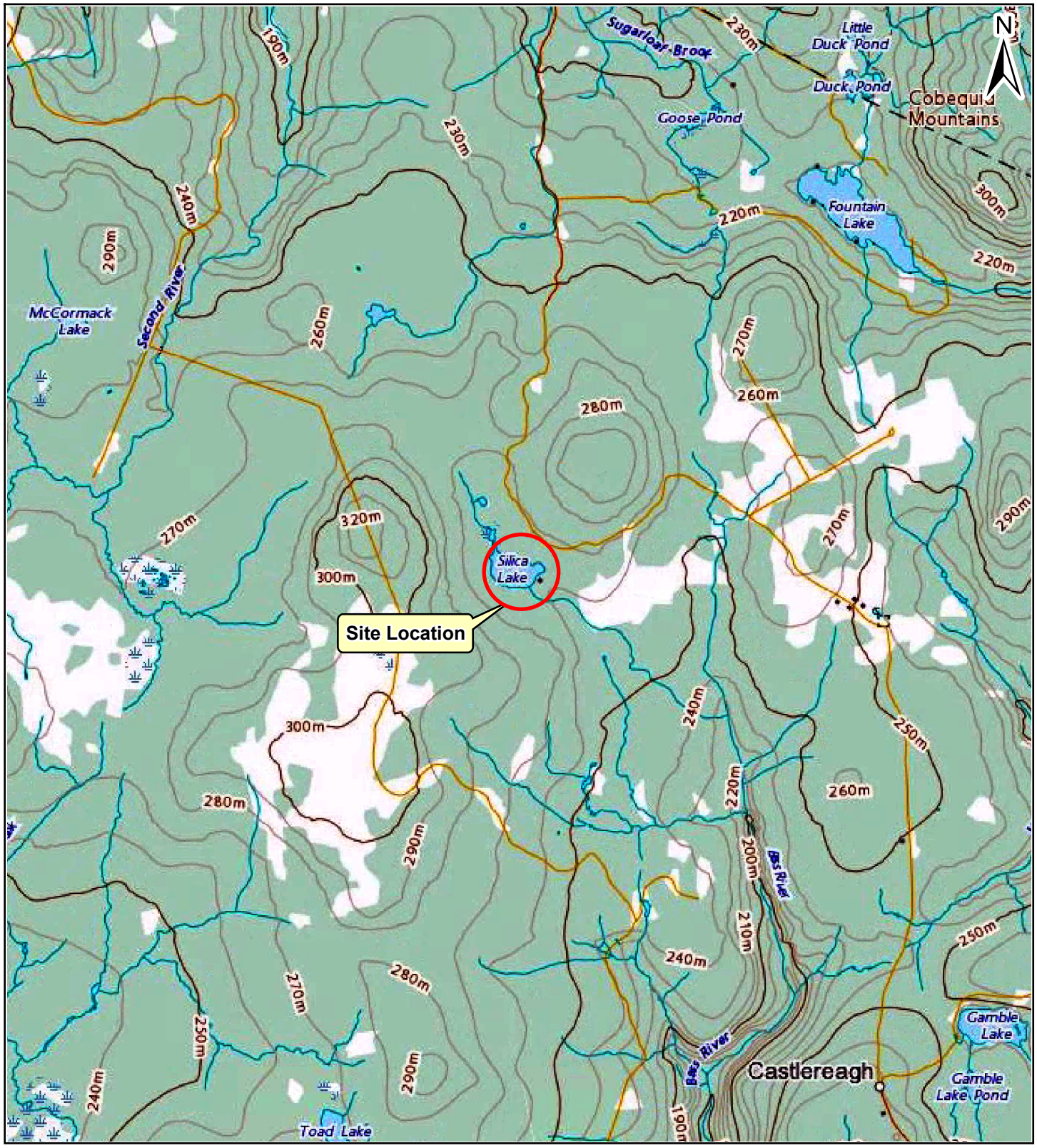
McHattie, T., White, C.E., Beresford, V. and Reid, M. 2013. The Eastern Cobequid Highlands: Redefined Geology and Economic Potential: Part 1: Nova Scotia Department of Natural Resources, Minerals Resource Branch, Open File Illustration ME 2013-016 Updated Bedrock Geology.

Nova Scotia Department of Labour and Advanced Education's. November 2013. Asbestos In the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace.

Nova Scotia Environment and Climate Change. July 2013. Phase II Environmental Site Assessment Protocol (PRO-400).

Stea, R.R. and Finck, P.W. 1988. Surficial geology map of parts of Cumberland, Colchester, and Hants counties, Nova Scotia (sheet 10). Nova Scotia Department of Energy and Mines, Map 88-13, scale 1:100,000.

Figures



Source: https://atlas.gc.ca/toporama/en/index.html

1:40,000

1,000 500 0 1,000

Metres

Title: **SITE LOCATION**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

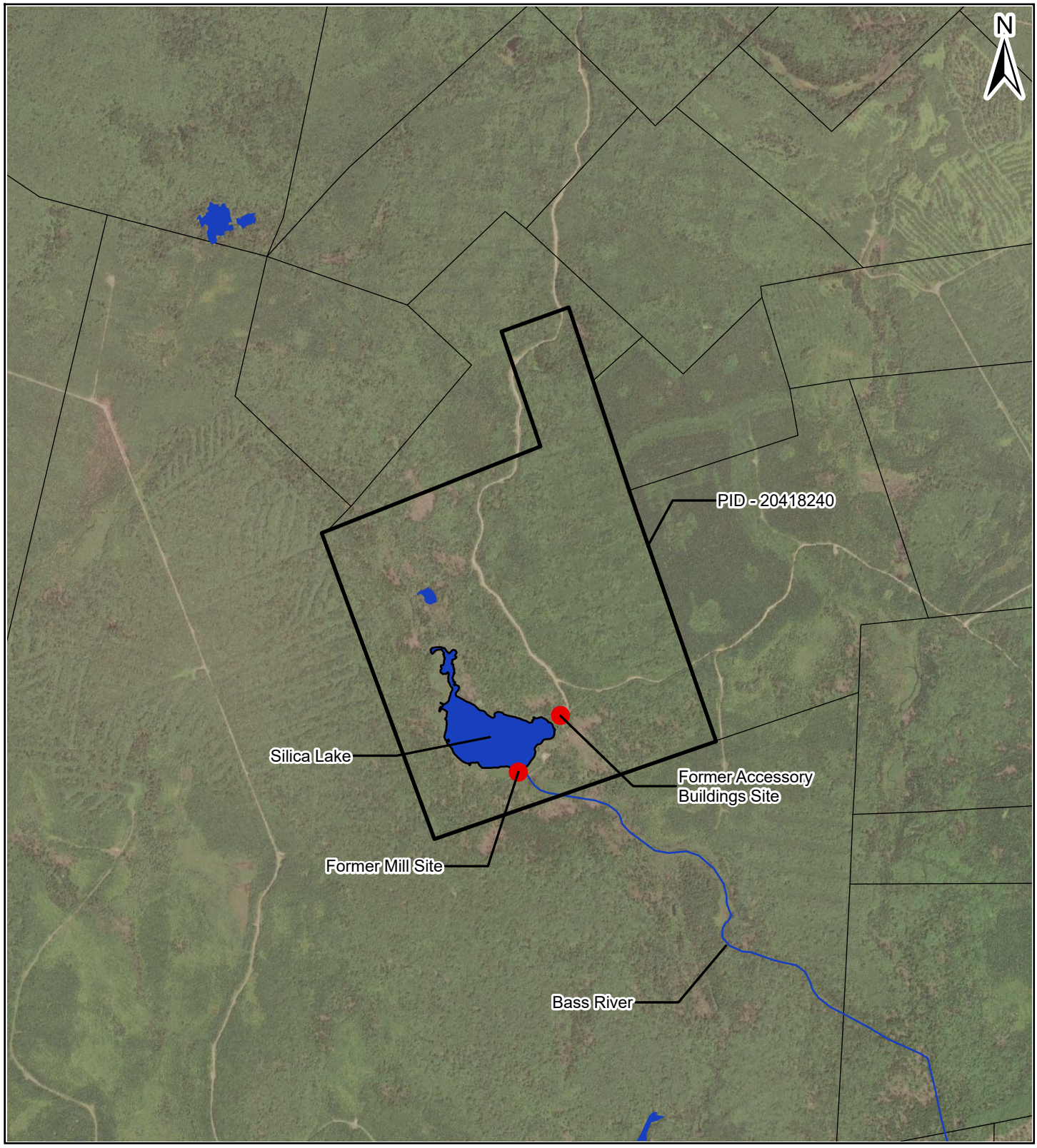
Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 1

Layout: 8.5" x 11" - (Author: mzarei)

{RF\pji01206} T:_ENV\CDN_GTA\NS_Castlereagh_SilicaLake\Phase II ESA\Phae II ESA.aprx - (Layout: Figure 1-Site Location)



Legend

- Former Site Locations
- Property Boundary

Source: https://www.viewpoint.ca/

1:20,000

500 250 0 500

Metres

Title: **SITE AND SURROUNDING PROPERTIES**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 2

Layout: 8.5" x 11" - (Author: mzarei)

{RF\mgi01044} T:_ENV\CDN_GTA\NS_Castlereagh_SilicaLake\Phase II ESA\Phae II ESA.aprx - (Layout: Figure 2-Site and Surrounding Properties)

Legend

Former Site Locations

Source: Google Earth, Satellite Imagery, Dated: 10//2/2023.

1:12,000

350 175 0 350

Metres

Title: **SITE AND SURROUNDING AREA**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 3

Layout: 8.5" x 11" - (Author: mzarei)

Legend

- Hand Auger
- Monitoring Well
- Surface Soil Sample
- Surface Water/Sediment Sample
- Area with Visible Brick at Surface
- Visible Concrete Foundation
- Beaver Dam
- Approximate Cleared Area/Tree Line (1933)
- Concrete Blocks or Structural Support Blocks
- Assumed Groundwater Flow Direction

Source: Background Google Imagery: GeoNova

1:1,250

10 5 0 10 20 30 40 50 60

Metres

Title: **FORMER MILL SITE - SAMPLE LOCATIONS**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 4

Layout: 8.5" x 11" - (Author: mzarei)

{RF\mgi01044} T:_ENV\CDN_GTA\NS_Castlereagh_SilicaLake\Phase II ESA\Phae II ESA.aprx - (Layout: Figure 4-Former Mill Site-Sample Locations)

Legend

- Hand Auger
- Monitoring Well
- Approximate Cleared Area/Tree Line (1933)
- Assumed Groundwater Flow Direction

Source: Background Google Imagery: GeoNova

1:1,250

10 5 0 10 20 30 40 50 60

Metres

Title: **FORMER ACCESSORY BUILDINGS SITE-SAMPLE LOCATIONS**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

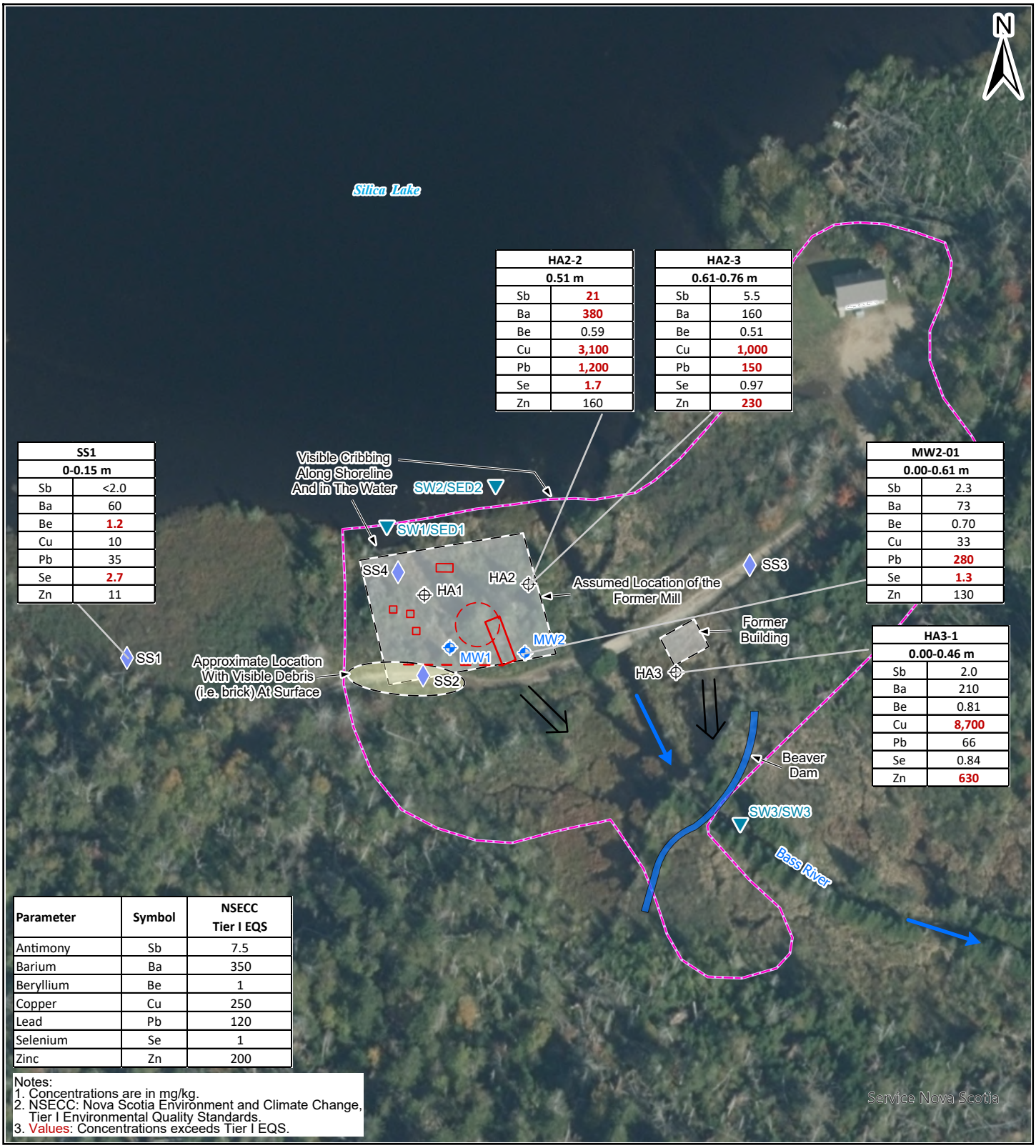
Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 5

Layout: 8.5" x 11" - (Author: mzarei)

{RF\pji01206} T:_ENV\CDN_GTA\NS_Castlereagh_SilicaLake\Phase II ESA\Phae II ESA.aprx - (Layout: Figure 5-Former Accessory Buildings Site-Sample Locations)



Parameter	Symbol	NSECC Tier I EQS
Antimony	Sb	7.5
Barium	Ba	350
Beryllium	Be	1
Copper	Cu	250
Lead	Pb	120
Selenium	Se	1
Zinc	Zn	200

Notes:
1. Concentrations are in mg/kg.
2. NSECC: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards.
3. Values: Concentrations exceeds Tier I EQS.

Legend

- Hand Auger
- Monitoring Well
- Surface Soil Sample
- Surface Water/Sediment Sample
- Area with Visible Brick at Surface
- Visible Concrete Foundation
- Beaver Dam
- Approximate Cleared Area/Tree Line (1933)
- Concrete Blocks or Structural Support Blocks
- Assumed Groundwater Flow Direction

Source: Background Google Imagery: GeoNova

1:1,250

10 5 0 10 20 30 40 50 60

Metres

Title: **FORMER MILL SITE - METAL EXCEEDANCES IN SOIL**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

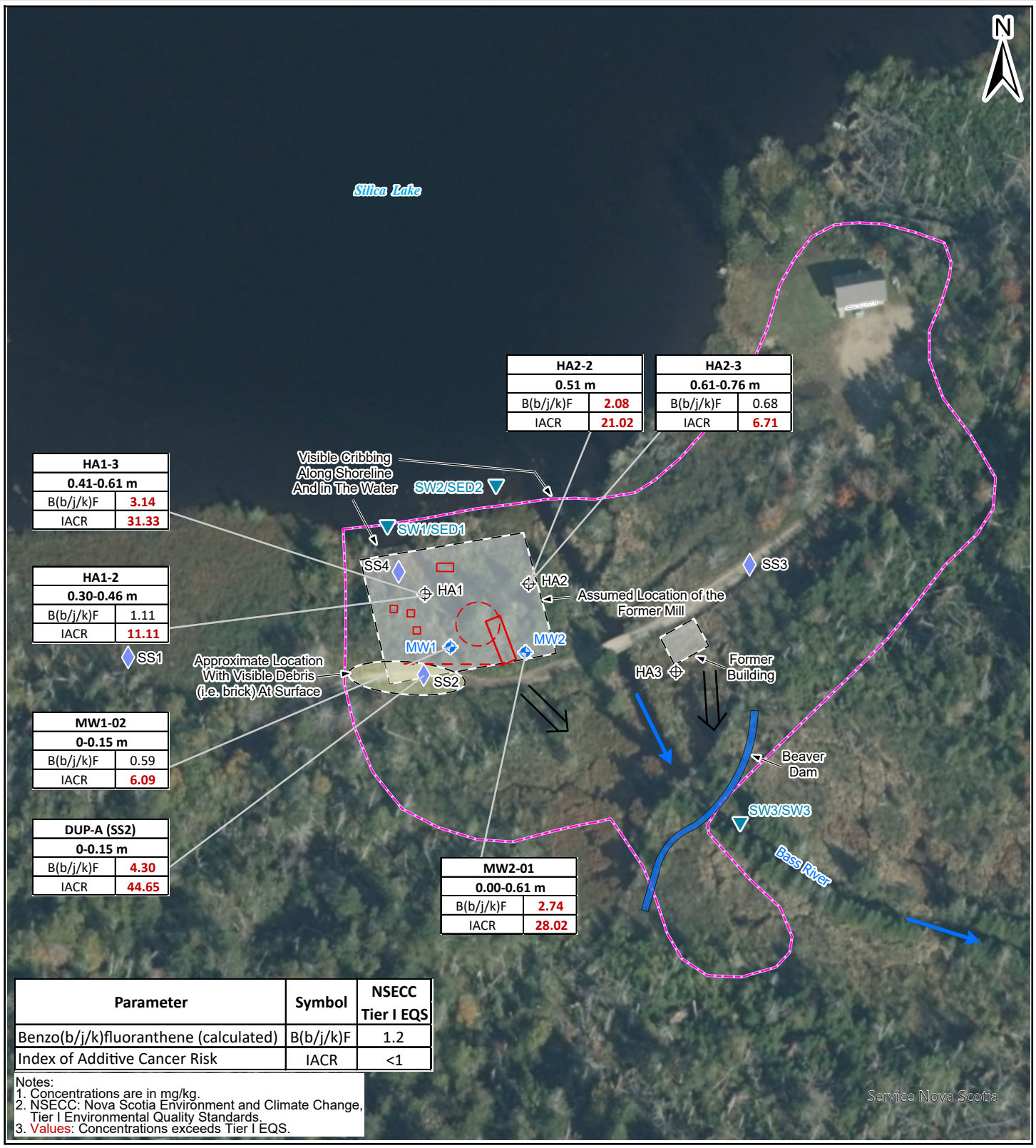
Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 6

Layout: 8.5" x 11" - (Author: mzarei)

{RF\pji01206} T:_ENV\CDN_GTA\NS_Castlereagh_SilicaLake\Phase II ESA\Phae II ESA.aprx - (Layout: Figure 6-Former Mill Site - Metal Exceedances in Soil)



Parameter	Symbol	NSECC Tier I EQS
Benzo(b/j/k)fluoranthene (calculated)	B(b/j/k)F	1.2
Index of Additive Cancer Risk	IACR	<1

Notes:
1. Concentrations are in mg/kg.
2. NSECC: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards.
3. Values: Concentrations exceeds Tier I EQS.

Legend

- Hand Auger
- Monitoring Well
- Surface Soil Sample
- Surface Water/Sediment Sample
- Area with Visible Brick at Surface
- Visible Concrete Foundation
- Beaver Dam
- Approximate Cleared Area/Tree Line (1933)
- Concrete Blocks or Structural Support Blocks
- Assumed Groundwater Flow Direction

Source: Background Google Imagery: GeoNova

1:1,250

10 5 0 10 20 30 40 50 60

Metres

Title: **FORMER MILL SITE - PAH EXCEEDANCES IN SOIL**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

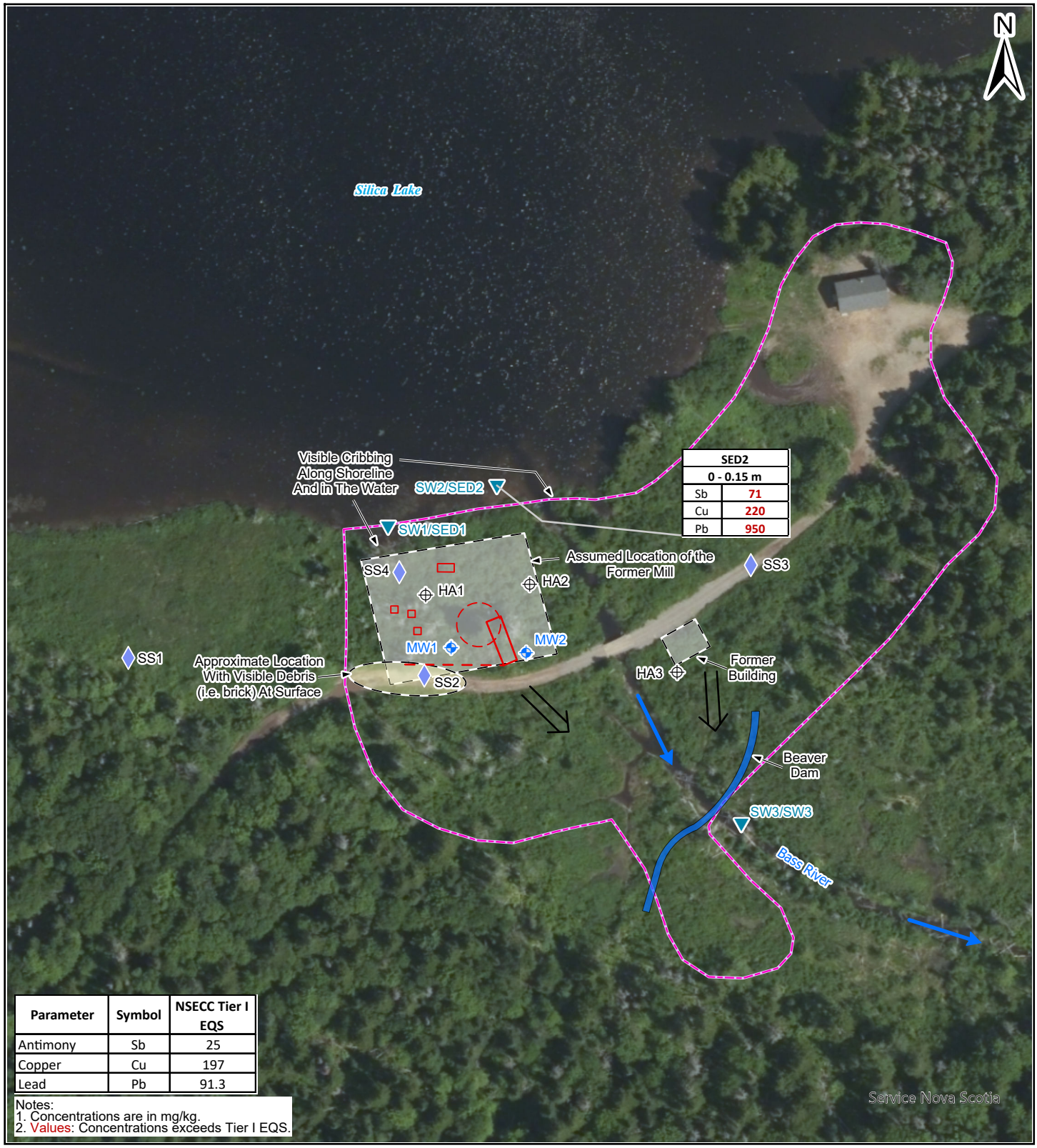
Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 7

Layout: 8.5" x 11" - (Author: mzarei)

{RF\pji01206} T:_ENV\CDN_GTA\NS_Castlereagh_SilicaLake\Phase II ESA\Phae II ESA.aprx - (Layout: Figure 7-Former Mill Site - PAH Exceedances in Soil)



Parameter	Symbol	NSECC Tier I EQS
Antimony	Sb	25
Copper	Cu	197
Lead	Pb	91.3

Notes:
1. Concentrations are in mg/kg.
2. Values: Concentrations exceeds Tier I EQS.

Legend

- Hand Auger
- Monitoring Well
- Surface Soil Sample
- Surface Water/Sediment Sample
- Area with Visible Brick at Surface
- Visible Concrete Foundation
- Beaver Dam
- Approximate Cleared Area/Tree Line (1933)
- Concrete Blocks or Structural Support Blocks
- Assumed Groundwater Flow Direction

Source: Background Google Imagery: GeoNova

1:1,250

10 5 0 10 20 30 40 50 60

Metres

Title: **FORMER MILL SITE - METAL EXCEEDANCES IN SEDIMENT**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

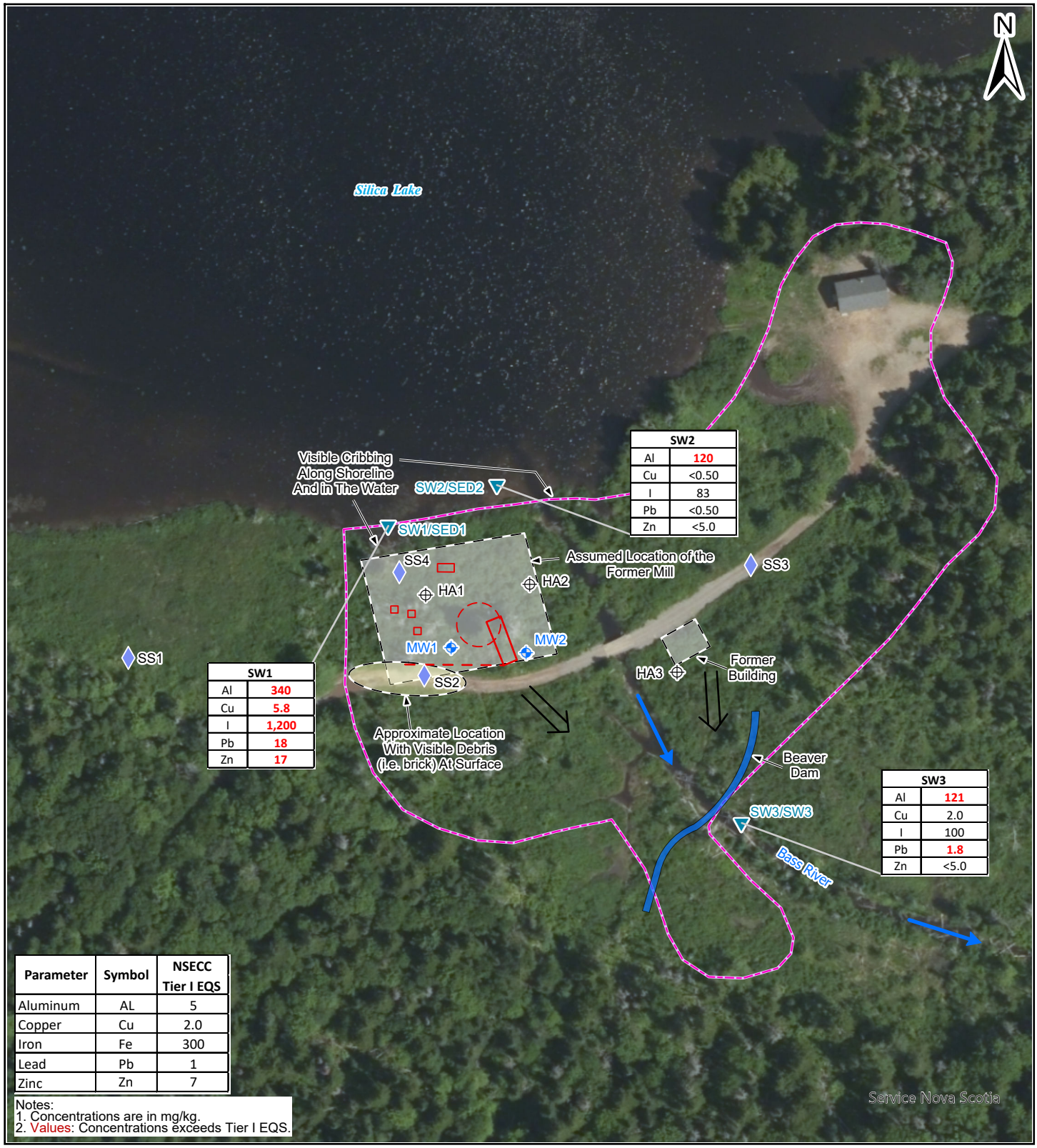
Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 8

Layout: 8.5" x 11" - (Author: mzarei)

{RF\pji01206} T:_ENV\CDN_GTA\NS_Castlereagh_SilicaLake\Phase II ESA\Phae II ESA.aprx - (Layout: Figure 8-Former Mill Site - Metal Exceedances in Sediment)



SW2	
Al	120
Cu	<0.50
I	83
Pb	<0.50
Zn	<5.0

SW1	
Al	340
Cu	5.8
I	1,200
Pb	18
Zn	17

SW3	
Al	121
Cu	2.0
I	100
Pb	1.8
Zn	<5.0

Parameter	Symbol	NSECC Tier I EQS
Aluminum	AL	5
Copper	Cu	2.0
Iron	Fe	300
Lead	Pb	1
Zinc	Zn	7

Notes:
1. Concentrations are in mg/kg.
2. Values: Concentrations exceeds Tier I EQS.

Legend

- Hand Auger
- Monitoring Well
- Surface Soil Sample
- Surface Water/Sediment Sample
- Area with Visible Brick at Surface
- Visible Concrete Foundation
- Beaver Dam
- Approximate Cleared Area/Tree Line (1933)
- Concrete Blocks or Structural Support Blocks
- Assumed Groundwater Flow Direction

Source: Background Google Imagery: GeoNova

1:1,250

10 5 0 10 20 30 40 50 60

Metres

Title: **FORMER MILL SITE - METAL EXCEEDANCES IN SURFACE WATER**

Project: **PHASE II ESA**
FORMER SILICA LAKE MINE
SILICA LAKE, CASTLEREAGH, NOVA SCOTIA

Client: **BUILD NOVA SCOTIA**

ARCADIS

FIGURE 9

Layout: 8.5" x 11" - (Author: mzarei)

Tables

TABLE 1

Depth to Groundwater and Relative Groundwater Elevations

Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Monitoring Well Location	*Ground Elevation (m)*	MW Elevation (m)	Depth to Groundwater (m)	Relative Groundwater Elevation (m)
MW1	100.05	100.00	0.41	99.59
MW2	100.04	99.99	0.40	99.59
MW3	102.11	102.05	1.78	100.27

MW1 (top of casing) was assigned a relative elevation of 100.00 m.

TABLE 2
Metals In Soil
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter				Former Mill Site											Former Accessory Buildings Site			
Sample ID	UNITS	RDL	NSECC Tier I EQS	MW1-02	MW2-01	HA1-2	HA1-3	HA2-2	HA2-3	HA3-1	SS1 (BSL)	SS2	SS3	SS4	DUP-A (SS2)	MW3-2 (BSL)	HA4-2	HA5-1	HA6-2
Sample Depth (m)				0.61-1.22	0.00-0.61	0.30-0.46	0.41-0.61	0.51	0.61-0.76	0.00-0.46	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0.61-1.22	0.60-1.11	0.00-0.60	0.60-1.08
Sample Date (Y/M/D)				2025-01-07	2025-01-07	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-15	2025-01-15	2025-01-14	2025-01-15	2025-01-07	2025-01-14	2025-01-14	2025-01-14
BV Labs ID				ANAS05	ANAS07	ANFV58	ANFV59	ANFV60	ANFV61	ANFV62	ANFV63	ANFV64	ANFV65	ANFV66	ANFV67	ANAS09	ANAS10	ANAS11	ANAS12
Aluminum	mg/kg	10	15,400	12000	8100	11000	9300	4700	5500	**16000**	**17000**	8400	**18000**	7200	9800	**16000**	15000	**21000**	**16000**
Antimony	mg/kg	2.0	7.5	4.8	2.3	3.0	3.3	**21**	5.5	2.0	<2.0	3.5	<2.0	<2.0	5.7	<2.0	<2.0	<2.0	<2.0
Arsenic	mg/kg	2.0	10	<2.0	3.4	3.1	2.5	6.4	4.1	**13**	<2.0	4.0	8.8	<2.0	4.3	4.3	3.7	5.3	4.6
Barium	mg/kg	5.0	350	72	73	160	140	**380**	160	210	60	38	59	56	40	26	21	42	32
Beryllium	mg/kg	1.0	1	<0.50	0.70	0.78	0.67	0.59	0.51	0.81	**1.2**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bismuth	mg/kg	2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	mg/kg	50	4,300	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium	mg/kg	0.30	1	<0.30	0.62	0.38	<0.30	0.63	0.56	0.32	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Chromium	mg/kg	2.0	220	22	9.9	9.7	9.7	5.6	6.8	20	6.5	16	33	5.1	17	27	30	33	41
Cobalt	mg/kg	1.0	22	8.8	5.8	3.8	3.1	3.9	2.6	9.7	1.5	6.8	9.9	<1.0	8.3	12	12	15	15
Copper	mg/kg	2.0	250	38	33	48	42	**3100**	**1000**	**8700**	10	19	42	16	24	44	33	30	59
Iron	mg/kg	50	11,000	**15000**	**13000**	9000	7100	**18000**	**13000**	**34000**	2400	**20000**	**27000**	4300	**25000**	**26000**	**26000**	**25000**	**29000**
Lead	mg/kg	0.50	120	53	**280**	62	60	**1200**	**150**	66	35	38	34	30	53	36	33	57	30
Lithium	mg/kg	2.0	-	13	6.8	4.9	4.6	2.3	3.1	17	2.3	13	18	2.4	14	17	18	20	19
Manganese	mg/kg	2.0	360	240	270	97	88	**1200**	250	**370**	110	270	**520**	12	330	**440**	**440**	**880**	**470**
Mercury	mg/kg	0.10	6.6	<0.10	<0.10	<0.10	<0.10	0.11	0.45	<0.10	0.32	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Molybdenum	mg/kg	2.0	15	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	mg/kg	2.0	70	15	9.6	7.9	7.0	5.7	6.6	14	4.0	13	17	2.9	14	19	22	19	23
Rubidium	mg/kg	2.0	-	5.6	5.6	3.3	3.4	3.8	3.3	16	<2.0	5.6	8.5	<2.0	5.3	7.1	5.5	13	10
Selenium	mg/kg	0.50	1	0.61	**1.3**	0.85	0.82	**1.7**	0.97	0.84	**2.7**	<0.50	0.53	0.64	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	mg/kg	0.50	77	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	4.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	mg/kg	5.0	9,400	14	11	9.2	7.6	36	18	17	13	12	17	<5.0	13	18	23	13	25
Thallium	mg/kg	0.10	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.16	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10	0.15	<0.10
Tin	mg/kg	1.0	9,400	11	3.8	2.0	2.1	36	12	47	<1.0	15	2.0	2.8	54	<1.0	<1.0	<1.0	<1.0
Uranium	mg/kg	0.10	23	0.95	1.0	1.2	1.1	1.0	0.36	0.64	1.4	0.46	0.57	1.2	0.54	0.66	0.46	0.62	0.44
Vanadium	mg/kg	2.0	39	**40**	21	18	15	13	8.6	38	5.8	29	**52**	12	37	**43**	**47**	37	**62**
Zinc	mg/kg	5.0	200	83	130	130	100	160	**230**	**630**	11	65	91	29	76	97	82	110	110

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Residential/Parkland, Potable, Coarse-Grained)
Dup A: Blind Field Duplicate of SS2
RDL: Reportable Detection Limit
BSL: Background Sample Location
<: Concentration is less than reportable detection limit
-: No Established Guideline
Bold: Guideline exceedance
Bold: Exceedances are representative of background soil quality

TABLE 3
Petroleum Hydrocarbons In Soil
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Depth (m)* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL*	NSECC Tier I EQS	Soil Samples	
				HA1-2	HA2-2
				0.30-0.46	0.51
				2025-01-14	2025-01-14
				ANFV58	ANFV60
Benzene	mg/kg	0.0050	0.021	<0.0050	<0.0050
Toluene	mg/kg	0.050	0.35	<0.050	<0.050
Ethylbenzene	mg/kg	0.010	0.043	<0.010	<0.010
Total Xylenes	mg/kg	0.050	0.73	<0.050	<0.050
C6-C10 (less BTEX)	mg/kg	2.5	-	<2.5	<2.5
>C10-C16 Hydrocarbons	mg/kg	10	-	<10	<10
>C16-C21 Hydrocarbons	mg/kg	10	-	<10	<10
>C21-<C32 Hydrocarbons	mg/kg	10	-	71	110
Modified TPH	mg/kg	-	75 (Gas) 320 (Fuel) 1800 (Lube)	71 (Lube)	110 (Lube)
Reached Baseline at C32	mg/kg	N/A	N/A	Yes	Yes
Hydrocarbon Resemblance	mg/kg	N/A	N/A	COMMENT (1)	COMMENT (1)

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Residential/Parkland, Potable, Coarse-Grained)
RDL: Reportable Detection Limit
<: Concentration is less than reportable detection limit
-: No Established Guideline
N/A: Not Applicable
Bold: Guideline exceedance
(1) Lube oil fraction.

TABLE 4
Polycyclic Aromatic Hydrocarbons In Soil
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Depth (m)* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL*	NSECC Tier I EQS	Former Mine Site												Former Accessory Buildings Site			
				MW1-02	MW2-01	HA1-2	HA1-3	HA2-2	HA2-3	HA3-1	SS1 (BSL)	SS2	SS3	SS4	DUP-A (SS2)	MW3-2 (BSL)	HA4-2	HA5-1	HA6-2
				0.61-1.22	0.00-0.61	0.30-0.46	0.41-0.61	0.51	0.61-0.76	0.00-0.46	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0.61-1.22	0.60-1.11	0.00-0.60	0.00-0.60
				2025-01-07	2025-01-07	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-14	2025-01-07	2025-01-07	2025-01-07	2025-01-07
				ANAS05	ANAS07	ANFV58	ANFV59	ANFV60	ANFV61	ANFV62	ANFV63	ANFV64	ANFV65	ANFV66	ANFV67	ANAS09	ANAS10	ANAS11	ANAS12
1-Methylnaphthalene	mg/kg	0.010	30	< 0.010	< 0.010	0.012	< 0.100	0.013	< 0.010	< 0.010	< 0.015	< 0.0050	0.0054	0.0094	< 0.050	< 0.010	< 0.010	< 0.010	< 0.010
2-Methylnaphthalene	mg/kg	0.010	30	< 0.010	< 0.010	0.011	< 0.100	0.010	< 0.010	< 0.010	< 0.015	< 0.0050	0.0070	0.0096	< 0.050	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	mg/kg	0.010	3,900	< 0.010	0.0750	0.028	< 0.100	0.043	< 0.010	< 0.010	< 0.015	0.0095	0.027	0.018	0.11	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	mg/kg	0.010	4.5	0.056	0.18	0.054	0.12	0.10	0.019	0.029	< 0.015	0.032	0.060	0.051	0.38	< 0.010	< 0.010	< 0.010	< 0.010
Anthracene	mg/kg	0.010	24,000	0.077	0.63	0.13	0.35	0.26	0.057	0.046	< 0.015	0.056	0.10	0.11	0.81	< 0.010	< 0.010	< 0.010	< 0.010
Benzo(a)anthracene	mg/kg	0.010	12	0.34	1.5	0.56	1.7	1.1	0.29	0.16	0.017	0.18	0.42	0.49	2.4	0.015	0.013	0.014	< 0.010
Benzo(a)pyrene	mg/kg	0.010	14	0.34	1.6	0.61	1.6	1.1	0.32	0.16	< 0.015	0.20	0.49	0.53	2.6	< 0.010	0.012	0.018	< 0.010
Benzo(b)fluoranthene	mg/kg	0.010	-	0.27	1.2	0.52	1.4	1.0	0.33	0.12	0.029	0.16	0.39	0.43	2.0	0.013	< 0.010	0.014	< 0.010
Benzo(b/j)fluoranthene	mg/kg	0.020	-	0.44	2.0	0.79	2.3	1.5	0.51	0.20	0.040	0.25	0.62	0.68	3.2	< 0.020	< 0.020	< 0.020	< 0.020
Benzo(g,h,i)perylene	mg/kg	0.010	250	0.20	0.73	0.32	0.84	0.72	0.61	0.084	< 0.015	0.12	0.32	0.27	1.5	< 0.010	< 0.010	< 0.010	< 0.010
Benzo(j)fluoranthene	mg/kg	0.010	-	0.17	0.78	0.28	0.86	0.48	0.18	0.077	0.012	0.097	0.23	0.25	1.2	< 0.010	< 0.010	< 0.010	< 0.010
Benzo(k)fluoranthene	mg/kg	0.010	-	0.15	0.74	0.32	0.84	0.58	0.17	0.071	< 0.015	0.089	0.21	0.26	1.1	< 0.010	< 0.010	< 0.010	< 0.010
Benzo(b/j/k)fluoranthene (calculated)	mg/kg	0.010	1.2	0.59	**2.74**	1.11	**3.14**	**2.08**	0.68	0.27	0.06	0.34	0.83	0.94	**4.30**	< 0.020	< 0.020	< 0.020	< 0.020
Chrysene	mg/kg	0.010	78	0.41	1.9	0.63	1.9	1.1	0.33	0.16	0.027	0.19	0.44	0.58	2.5	0.016	0.015	0.019	< 0.010
Dibenzo(a,h)anthracene	mg/kg	0.010	8.8	0.039	0.17	0.080	0.19	0.18	0.067	0.022	< 0.015	0.026	0.070	0.072	0.33	< 0.010	< 0.010	< 0.010	< 0.010
Fluoranthene	mg/kg	0.010	3,500	0.96	4.9	1.7	5.5	2.5	0.69	0.44	0.054	0.54	1.1	1.5	7.0	0.027	0.025	0.025	< 0.010
Fluorene	mg/kg	0.010	2,700	0.022	0.26	0.052	0.13	0.068	0.011	0.027	< 0.015	0.016	0.031	0.037	0.23	< 0.010	< 0.010	< 0.010	< 0.010
Indeno(1,2,3-cd)pyrene	mg/kg	0.010	98	0.17	0.74	0.36	1.0	0.82	0.49	0.098	0.019	0.14	0.34	0.34	1.7	< 0.010	< 0.010	< 0.010	< 0.010
Naphthalene	mg/kg	0.010	2.2	< 0.010	0.035	0.033	<0.10	0.024	< 0.010	0.015	< 0.015	0.0061	0.0080	0.019	0.059	< 0.010	< 0.010	< 0.010	< 0.010
Perylene	mg/kg	0.010	-	0.21	0.30	0.15	0.37	0.26	0.096	0.035	0.14	0.047	0.12	0.12	0.64	< 0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	mg/kg	0.010	17	0.43	3.9	1.0	2.9	1.3	0.24	0.32	0.024	0.33	0.59	0.78	4.4	< 0.010	< 0.010	0.012	< 0.010
Pyrene	mg/kg	0.010	2,100.0	0.75	3.8	1.4	4.4	2.0	0.61	0.34	0.045	0.44	0.97	1.2	5.9	0.024	0.020	0.023	< 0.010
Benzo[a]pyrene Total Potency Equivalents (B[a]P TPE)	mg/kg	N/A	5.3	0.60	2.69	1.04	2.95	1.96	0.64	0.28	0.07	0.34	0.83	0.90	4.38	0.04	0.04	0.04	0.04
Index of Additive Canacer Risk (IACR)	mg/kg	N/A	<1	**6.09**	**28.02**	**11.11**	**31.33**	**21.02**	**6.71**	2.83	0.52	3.48	**8.47**	**9.55**	**44.65**	0.25	0.25	0.27	0.24

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Residential/Parkland, Potable,Coarse-Grained)
Dup-A: Blind field duplicate sample of SS2
RDL: Reportable detection limit. RDLs varied between samples.
BSL: Background Sample Location
<: Concentration is less than reportable detection limit
-: No established guideline
N/A: Not applicable
Bold: Guideline exceedance

TABLE 5
General Chemistry In Groundwater
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	NSECC Tier I EQS	Groundwater Samples			
				MW1	MW2	MW3 (BSL)	DUP-A (MW2)
				2025-01-14	2025-01-14	2025-01-14	2025-01-14
				ANFV54	ANFV55	ANFV56	ANFV57
Calculated Parameters							
Anion Sum	me/L	N/A	-	2.13	2.19	1.53	2.19
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.0	-	95	100	21	100
Calculated TDS	mg/L	1.0	-	140	140	100	140
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.0	-	<1.0	<1.0	<1.0	<1.0
Cation Sum	me/L	N/A	-	2.48	2.57	1.41	2.56
Hardness (CaCO3)	mg/L	1.0	-	100	110	47	110
Ion Balance (% Difference)	%	N/A	-	7.59	7.98	4.08	7.79
Langelier Index (@ 20C)	N/A	-	-	-0.343	-0.130	-1.82	-0.0430
Langelier Index (@ 4C)	N/A	-	-	-0.593	-0.381	-2.07	-0.293
Nitrate (N)	mg/L	0.050	-	<0.050	<0.050	<0.050	<0.050
Saturation pH (@ 20C)	N/A	-	-	7.86	7.77	9.02	7.77
Saturation pH (@ 4C)	N/A	-	-	8.11	8.02	9.27	8.02
Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L	2.0	-	95	100	21	100
Dissolved Chloride (Cl-)	mg/L	1.0	250	5.0	3.3	7.8	3.3
Colour	TCU	5.0	-	8.1	13	<5.0	14
Nitrate + Nitrite (N)	mg/L	0.050	-	<0.050	<0.050	<0.050	<0.050
Nitrite (N)	mg/L	0.010	-	<0.010	<0.010	<0.010	<0.010
Nitrogen (Ammonia Nitrogen)	mg/L	0.050	-	0.28	0.23	<0.050	0.24
Total Organic Carbon (C)	mg/L	5.0	-	12 (1)	8.4 (1)	9.4 (1)	7.9 (1)
Orthophosphate (P)	mg/L	0.010	-	<0.010	<0.010	<0.010	<0.010
pH	pH	-	-	7.51	7.63	7.21	7.72
Reactive Silica (SiO2)	mg/L	1.0	-	25	23	8.7	22
Dissolved Sulphate (SO4)	mg/L	2.0	-	4.4	<2.0	43	<2.0
Turbidity	NTU	1.0	-	>1000	810	>1000	730
Conductivity	uS/cm	1.0	-	240	240	170	240

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Residential/Parkland, Potable, Coarse-Grained)
RDL: Reportable Detection Limit
BSL: Background Sample Location
<: Concentration is less than reportable detection limit
-: No Established Guideline
N/A: Not Applicable
Bold: Guideline exceedance

TABLE 6
Metals In Groundwater
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	NSECC Tier I EQS	Groundwater Samples			
				MW1	MW2	MW3 (BSL)	DUP-A (MW2)
				025/01/14	025/01/14	025/01/14	025/01/14
				ANFV54	ANFV55	ANFV56	ANFV57
Aluminum	ug/L	5.0	100	<5.0	<5.0	30	<5.0
Antimony	ug/L	1.0	6	<1.0	<1.0	<1.0	<1.0
Arsenic	ug/L	1.0	10	<1.0	<1.0	<1.0	<1.0
Barium	ug/L	1.0	1,000	280	230	250	220
Beryllium	ug/L	0.10	4	<0.10	<0.10	<0.10	<0.10
Bismuth	ug/L	2.0	-	<2.0	<2.0	<2.0	<2.0
Boron	ug/L	50	5,000	<50	<50	<50	<50
Cadmium	ug/L	0.010	5	0.081	0.070	0.072	0.11
Calcium	ug/L	100	-	34000	38000	10000	38000
Chromium	ug/L	1.0	50	<1.0	<1.0	<1.0	1.4
Cobalt	ug/L	0.40	3.8	1.1	0.40	13	0.50
Copper	ug/L	0.50	2,000	1.9	3.0	0.76	4.4
Iron	ug/L	50	300	<50	<50	<50	57
Lead	ug/L	0.50	5	<0.50	<0.50	<0.50	<0.50
Magnesium	ug/L	100	-	4,000	4700	5400	4700
Manganese	ug/L	2.0	120	**1100**	**1100**	**5300**	**1300**
Molybdenum	ug/L	2.0	70	<2.0	2.1	<2.0	2.1
Nickel	ug/L	2.0	100	<2.0	<2.0	2.9	<2.0
Phosphorus	ug/L	100	-	<100	<100	<100	<100
Potassium	ug/L	100	-	2500	2000	1600	2200
Selenium	ug/L	0.50	50	<0.50	<0.50	<0.50	<0.50
Silver	ug/L	0.10	-	<0.10	<0.10	<0.10	<0.10
Sodium	ug/L	100	-	8600	5100	9900	5000
Strontium	ug/L	2.0	2,400	110	100	36	100
Thallium	ug/L	0.10	2	<0.10	<0.10	<0.10	<0.10
Tin	ug/L	2.0	2,400	<2.0	<2.0	<2.0	<2.0
Titanium	ug/L	2.0	-	<2.0	<2.0	<2.0	<2.0
Uranium	ug/L	0.10	20	0.16	0.20	<0.10	0.26
Vanadium	ug/L	2.0	6.2	<2.0	<2.0	<2.0	<2.0
Zinc	ug/L	5.0	5,000	7.8	<5.0	120	<5.0

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Residential/Parkland, Potable, Coarse-Grained)
Dup A: Blind Field Duplicate of MW2
RDL: Reportable Detection Limit
BSL: Background Sample Location
<: Concentration is less than reportable detection limit
-: No Established Guideline
Bold: Guideline exceedance
Bold: Exceedances are representative of background soil quality

TABLE 7
General Chemistry In Sediment
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Samples Depth (m)* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	NSECC Tier I EQS	Sediment Samples		
				SED1	SED2	SED3
				0 - 0.15	0 - 0.15	0 - 0.15
				2024-12-20	2024-12-20	2024-12-20
				ANAJ19	ANAJ20	ANAJ21
Inorganics						
Ammonia	mg/kg	0.40	-	1.4	1.1	2.1
Chloride	mg/kg	5.0	-	6.2	6.3	6.0
Conductivity	uS/cm	1.0	-	17	18	26
Moisture	%	1.0	-	52	55	33
Nitrate + Nitrite	mg/kg	0.30	-	0.43	0.38	0.41
Nitrite	mg/kg	0.050	-	<0.050	<0.050	<0.050
Orthophosphate	mg/kg	0.050	-	0.079	0.19	0.098
Soluble (5:1) pH	pH	N/A	-	4.89	5.57	4.93
Sulphate	mg/kg	10	-	<10	19	25

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Sediment, Freshwater Sediment)
RDL: Reportable Detection Limit (RDL values vary)
<: Concentration is less than reportable detection limit
-: No Established Guideline
Bold: Guideline exceedance

TABLE 8
Metals In Sediment
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Depth (m)* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	NSECC Tier I EQS	Sediment Samples		
				SED1	SED2	SED3
				0 - 0.15	0 - 0.15	0 - 0.15
				2024-12-20	2024-12-20	2024-12-20
				ANAJ19	ANAJ20	ANAJ21
Aluminum	mg/kg	10	-	7900	1900	9900
Antimony	mg/kg	2.0	25	<2.0	**71**	<2.0
Arsenic	mg/kg	2.0	17	<2.0	5.3	<2.0
Barium	mg/kg	5.0	-	96	52	48
Beryllium	mg/kg	0.50	-	0.59	<0.50	<0.50
Bismuth	mg/kg	2.0	-	<2.0	<2.0	<2.0
Boron	mg/kg	50	-	<50	<50	<50
Cadmium	mg/kg	0.30	3.5	<0.30	<0.30	<0.30
Chromium	mg/kg	2.0	90	5.7	5.7	18
Cobalt	mg/kg	1.0	-	2.0	2.6	7.1
Copper	mg/kg	2.0	197	16	**220**	21
Iron	mg/kg	50	43,766	3000	26000	15000
Lead	mg/kg	0.50	91.3	16	**950**	28
Lithium		2.0	-	2.6	<2.0	14
Manganese	mg/kg	2.0	1,100	45	130	230
Mercury	mg/kg	0.10	0.486	<0.10	<0.10	<0.10
Molybdenum	mg/kg	2.0	-	<2.0	<2.0	<2.0
Nickel	mg/kg	2.0	75	4.6	4.5	15
Rubidium	mg/kg	2.0	-	3.1	<2.0	6.3
Selenium	mg/kg	0.50	2	<0.50	<0.50	<0.50
Silver	mg/kg	0.50	0.5	<0.50	<0.50	<0.50
Strontium	mg/kg	5.0	-	5.3	<5.0	13
Thallium	mg/kg	0.10	-	<0.10	<0.10	<0.10
Tin	mg/kg	1.0	-	1.3	30	2.9
Uranium	mg/kg	0.10	-	1.1	0.28	0.50
Vanadium	mg/kg	2.0	-	12	15	27
Zinc	mg/kg	5.0	315	36	65	58

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Sediment, Freshwater Sediment)
RDL: Reportable Detection Limit
<: Concentration is less than reportable detection limit
-: No Established Guideline
Bold: Guideline exceedance

TABLE 9
General Chemistry In Surface Water
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	NSECC Tier I EQS	Surface Water		
				SW1	SW2	SW3
				2024-12-20	2024-12-20	2024-12-20
				ANAJ19	ANAJ20	ANAJ21
Calculated Parameters						
Anion Sum	me/L	N/A	-	0.230	0.220	0.240
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.0	-	2.4	3.4	3.3
Calculated TDS	mg/L	1.0	-	23	17	18
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.0	-	<1.0	<1.0	<1.0
Cation Sum	me/L	N/A	-	0.230	0.160	0.160
Hardness (CaCO3)	mg/L	1.0	-	4.5	3.0	3.5
Ion Balance (% Difference)	%	N/A	-	0.00	15.8	20.0
Langelier Index (@ 20C)	N/A		-	-5.06	-4.61	-4.61
Langelier Index (@ 4C)	N/A		-	-5.31	-4.86	-4.86
Nitrate (N)	mg/L	0.050	13	0.065	0.11	0.11
Saturation pH (@ 20C)	N/A		-	10.8	10.9	10.8
Saturation pH (@ 4C)	N/A		-	11.1	11.1	11.1
Inorganics						
Total Alkalinity (Total as CaCO3)	mg/L	2.0	-	2.4	3.4	3.3
Dissolved Chloride (Cl-)	mg/L	1.0	120	3.7	3.2	3.1
Colour	TCU	5.0	-	55	32	30
Nitrate + Nitrite (N)	mg/L	0.050	-	0.065	0.11	0.11
Nitrite (N)	mg/L	0.010	0.06	<0.010	<0.010	<0.010
Nitrogen (Ammonia Nitrogen)	mg/L	0.050	-	<0.050	0.17	<0.050
Total Organic Carbon (C)	mg/L	0.50	-	8.3	3.7	3.0
Orthophosphate (P)	mg/L	0.010	-	<0.010	<0.010	<0.010
pH	pH	-	6.5 - 9	**5.77**	6.26	6.21
Reactive Silica (SiO2)	mg/L	0.50	-	8.7	5.2	4.9
Dissolved Sulphate (SO4)	mg/L	2.0	-	3.5	2.7	3.8
Turbidity	NTU	0.10	-	16	0.43	0.69
Conductivity	uS/cm	1.0	-	21	19	19

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Surface Water, Freshwater)

RDL: Reportable Detection Limit (RDL values vary)

<: Concentration is less than reportable detection limit

-: No Established Guideline

Bold: Guideline exceedance

TABLE 10
Metals In Surface Water
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	NSECC Tier I EQS	Surface Water Samples		
				SW1	SW2	SW3
				2024-12-20	2024-12-20	2024-12-20
				ANAJ19	ANAJ20	ANAJ21
Aluminum	ug/L	5.0	5	**340**	**120**	**110**
Antimony	ug/L	1.0	9	1.8	<1.0	<1.0
Arsenic	ug/L	1.0	5.0	<1.0	<1.0	<1.0
Barium	ug/L	1.0	1,000	20	8.3	11
Beryllium	ug/L	0.10	0.15	<0.10	<0.10	<0.10
Bismuth	ug/L	2.0	-	<2.0	<2.0	<2.0
Boron	ug/L	50	1,500	<50	<50	<50
Cadmium	ug/L	0.010	0.09	0.049	0.017	0.021
Calcium	ug/L	100	-	1200	720	880
Chromium	ug/L	1.0	8.9	<1.0	<1.0	<1.0
Cobalt	ug/L	0.40	1	0.64	<0.40	<0.40
Copper	ug/L	0.50	2.0	**5.8**	<0.50	2.0
Iron	ug/L	50	300	**1200**	83	100
Lead	ug/L	0.50	1	**18**	<0.50	**1.8**
Magnesium	ug/L	100	-	380	290	330
Manganese	ug/L	2.0	430	76	18	24
Molybdenum	ug/L	2.0	73	<2.0	<2.0	<2.0
Nickel	ug/L	2.0	25	<2.0	<2.0	<2.0
Phosphorus	ug/L	100	-	<100	<100	<100
Potassium	ug/L	100	-	270	160	180
Selenium	ug/L	0.50	1.0	<0.50	<0.50	<0.50
Silver	ug/L	0.10	0.25	<0.10	<0.10	<0.10
Sodium	ug/L	100	-	1900	1800	1900
Strontium	ug/L	2.0	21,000	7.9	5.4	7.3
Thallium	ug/L	0.10	0.8	<0.10	<0.10	<0.10
Tin	ug/L	2.0	-	<2.0	<2.0	<2.0
Titanium	ug/L	2.0	315	9.8	<2.0	<2.0
Uranium	ug/L	0.10	15	<0.10	<0.10	<0.10
Vanadium	ug/L	2.0	120	<2.0	<2.0	<2.0
Zinc	ug/L	5.0	7	**17**	<5.0	<5.0

NSECC Tier I EQS: Nova Scotia Environment and Climate Change, Tier I Environmental Quality Standards (Surface Water, Freshwater)
RDL: Reportable Detection Limit
<: Concentration is less than reportable detection limit
-: No Established Guideline
Bold: Guideline exceedance

TABLE 11

Asbestos in Brick and Grout Samples

Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Sample ID	Description	Color	Asbestos Results
1-A	Exterior/Refractory Brick - Yellow Coloured	Yellow	None Detected
1-B	Exterior/Refractory Brick - Yellow Coloured	Yellow	None Detected
1-C	Exterior/Refractory Brick - Yellow Coloured	Yellow	None Detected
2-A-Brick	Exterior/Brick - Red Coloured	Red	None Detected
2-A-Mastic	Exterior/Brick - Red Coloured	Red	None Detected
2-B	Exterior/Brick - Red Coloured	Red	None Detected
2-C	Exterior/Brick - Red Coloured	Red	None Detected
3-A-Brick	Exterior/Mortar on Red Coloured Brick	Red	None Detected
3-A-Mortar 1	Exterior/Mortar on Red Coloured Brick	Red	None Detected
3-A-Mortar 2	Exterior/Mortar on Red Coloured Brick	Red	None Detected
3-B	Exterior/Mortar on Red Coloured Brick	Red	None Detected
3-C-Brick	Exterior/Mortar on Red Coloured Brick	Red	None Detected
3-C-Mortar 1	Exterior/Mortar on Red Coloured Brick	Red	None Detected
3-C-Mortar 2	Exterior/Mortar on Red Coloured Brick	Red	None Detected

Asbestos Containing Material: Any material containing at least 0.5% of any type of asbestos, and vermiculite that is identified to contain any amount of asbestos (Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace).

Appendix A

Photographs

Project Photographs

Phase II Environmental Site Assessment
Former Silica Lake Mine, Castlereagh, Nova Scotia

Photo: 1

Date:
January 7, 2025

Description:
Approach to the Site, with a caution sign for any ATV drivers on the trail.

Photo: 2

Date:
January 7, 2024

Description:
Advancing the hand auger hole HA4 at the Former Accessory Buildings Site.

Project Photographs

Phase II Environmental Site Assessment
Former Silica Lake Mine, Castlereagh, Nova Scotia

Photo: 3

Date:
January 7, 2024

Description:
View of HA5, in the foreground, at the Former Accessory Buildings Site.

Photo: 4

Date:
January 7, 2024

Description:
View of HA6 at the Former Accessory Buildings Site.

Project Photographs

Phase II Environmental Site Assessment
Former Silica Lake Mine, Castlereagh, Nova Scotia

Photo: 5

Date:
January 7, 2024

Description:
View of MW1 (bottom center of photograph), off the ATV trail.

Photo: 6

Date:
August 8, 2024

Description:
View of MW2 (bottom center of photograph), just off the ATV Trail.

Project Photographs

Phase II Environmental Site Assessment
Former Silica Lake Mine, Castlereagh, Nova Scotia

Photo: 7

Date:
January 7, 2025

Description:
View of MW3, near the intersection of Silica Road and Old Castlereagh Road.

Photo: 8

Date:
December 20, 2024

Description:
Sediment from SED1 (assumed to be the diatomite that was mined from Silica Lake).

Project Photographs

Phase II Environmental Site Assessment
Former Silica Lake Mine, Castlereagh, Nova Scotia

Photo: 9

Date:
December 20, 2024

Description:
SW2/SED2 sample location (along the left side of the open water), where Silica Lake discharges into Bass River.

Photo: 10

Date:
December 20, 2024

Description:
Sediment from SED2.

Project Photographs

Phase II Environmental Site Assessment
Former Silica Lake Mine, Castlereagh, Nova Scotia

Photo: 10

Date:
December 20, 2024

Description:
SW3/SED3 sample location within Bass River.

Photo: 10

Date:
December 20, 2024

Description:
Sediment at SED3.

Appendix B

Monitoring Well, Auger Hole, Sediment and Surface Soil Logs

BOREHOLE/MONITORING WELL ID: MW-1

PROJECT NUMBER 30235902 **CLIENT** Build Nova Scotia

PROJECT NAME Phase I/II ESA, Former Silica Lake Mine **PROJECT LOCATION** Castlereagh, Colchester County, Nova Scotia

PROJECTION Refer to Figure **GROUND ELEVATION** Not Surveyed **TOR ELEVATION** Not Surveyed

LATITUDE 45° 31.3921' N **LONGITUDE** 63° 48.2402' W **GROUND WATER LEVEL** 0.46 m bgs ()

HOLE DIAMETER 5.08 cm (2.00") **WELL DIAMETER** 5.08 cm (2.00") **GROUND WATER ELEVATION** Not Surveyed

DEPTH (m)	GRAPHIC LOG	SUBSURFACE PROFILE	ELEVATION (m) DEPTH (m bgs)	SAMPLE ID	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	Organic Vapour Meter (ppm)	LAB ANALYSIS	WELL COMPLETION DETAIL (Casing Type: Flush Mount; Ground Level to TOR: 0.051)	DEPTH (m)
0		Topsoil	-0.03							Silica Sand	0
0.2		**CLAYEY SILT**, some sand, brown, soft, moist. Note: Water encountered at 0.6m.	0.03			17	1 1 2 1	NA		Bentonite	0.2
0.4											0.4
0.6			-0.6								0.6
0.8		**SILTY SAND**, some gravel, brown, fine to coarse grained, loose, wet. Note: pieces of peat observed from 0.6 to 1.2m. A reddish brown discoloration was observed in the bottom 0.13m.	0.60	MW1-02		54	5 8 7 6	NA	Metals and PAHs		0.8
1.0											1.0
1.2											1.2
1.4						46	5 14 15 14	NA		Silica Sand	1.4
1.6											1.6
1.8			-1.8							Slotted pipe Screen	1.8
2.0		**CLAYEY SAND**, red, fine grained, compact, moist.	1.80			50	10 11 9 6	NA			2.0
2.2											2.2
2.4			-2.4								2.4
2.6		**SAND**, red, medium to coarse grained, loose, wet.	2.40			63	7 25 21 18	NA			2.6
2.8											2.8
3.0			-3								3.0
		End of Borehole at 3.00 m bgs	3.00								

DRILLING DRILLED BY Nova Drilling **LOGGED BY** David Panza & Holly Bouma

DRILLING DRILL METHOD CME55 **CHECKED BY** Randy Fancey

DRILL DATE(S) 07-Jan-2025

ARCADIS

BOREHOLE/MONITORING WELL ID: MW-2

PROJECT NUMBER 30235902 **CLIENT** Build Nova Scotia

PROJECT NAME Phase I/II ESA, Former Silica Lake Mine **PROJECT LOCATION** Castlereagh, Colchester County, Nova Scotia

PROJECTION Refer to Figure **GROUND ELEVATION** Not Surveyed **TOR ELEVATION** Not Surveyed

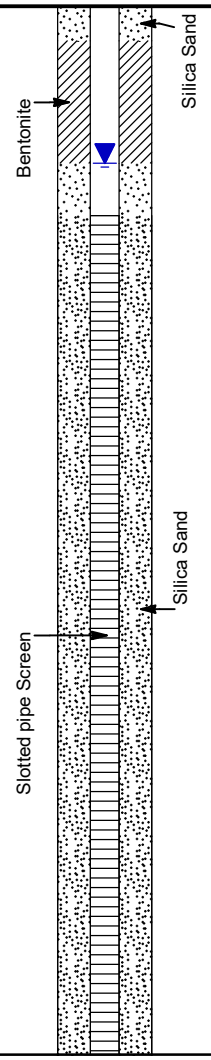
LATITUDE 45° 31.3915' N **LONGITUDE** 63° 48.2268' W **GROUND WATER LEVEL** 0.45 m bgs ()

HOLE DIAMETER 5.08 cm (2.00") **WELL DIAMETER** 5.08 cm (2.00 ") **GROUND WATER ELEVATION** Not Surveyed

DEPTH (m)	GRAPHIC LOG	SUBSURFACE PROFILE	ELEVATION (m) DEPTH (m bgs)	SAMPLE ID	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	Organic Vapour Meter (ppm)	LAB ANALYSIS
0.2		**SILTY SAND**, trace clay, brown, loose, moist. Note: fine pieces of soft pink rock observed.		MW2-01		38	1 2 2 5	NA	Metals and PAHs
0.4			-0.6						
0.6		**GRAVELLY SAND**, with clay, brown, coarse grained, wet.	0.60			25	10 13 13 11	NA	
0.8									
1.0			-1.2						
1.2		**GRAVELLY SAND**, brown, coarse grained, wet.	1.20			42	8 10 11 10	NA	
1.4									
1.6			-1.8						
1.8		**SAND**, trace clay, brown, fine to coarse grained, compact, moist to wet.	1.80			63	12 12 13 21	NA	
2.0									
2.2			-2.4						
2.4		**SAND**, some gravel, brown, fine to coarse grained, loose, moist to wet.	2.40			54	17 18 15 9	NA	
2.6									
2.8			-3						
3.0		End of Borehole at 3.00 m bgs	3.00						

WELL COMPLETION DETAIL

Casing Type: Flush Mount
Ground Level to TOR: 0.05



DEPTH (m)

DRILLING DRILLED BY Nova Drilling **LOGGED BY** David Panza & Holly Bouma

DRILLING DRILL METHOD CME55 **CHECKED BY** Randy Fancey

DRILL DATE(S) 07-Jan-2025

Note: Any decisions/actions made by a third party based on this log are the sole responsibility of the third party. Arcadis Canada Inc. accepts no liability for third party decisions/actions made based on this log.

ARCADIS

Arcadis Telephone: Fax:

BOREHOLE/MONITORING WELL ID: MW-3

PROJECT NUMBER 30235902 **CLIENT** Build Nova Scotia

PROJECT NAME Phase I/II ESA, Former Silica Lake Mine **PROJECT LOCATION** Castlereagh, Colchester County, Nova Scotia

PROJECTION Refer to Figure **GROUND ELEVATION** Not Surveyed **TOR ELEVATION** Not Surveyed

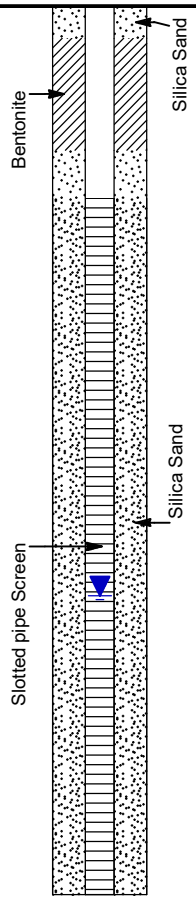
LATITUDE 45° 31.5247' N **LONGITUDE** 63° 48.0966' W **GROUND WATER LEVEL** 1.84 m bgs ()

HOLE DIAMETER 5.08 cm (2.00") **WELL DIAMETER** 5.08 cm (2.00 ") **GROUND WATER ELEVATION** Not Surveyed

DEPTH (m)	GRAPHIC LOG	SUBSURFACE PROFILE	ELEVATION (m) DEPTH (m bgs)	SAMPLE ID	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	Organic Vapour Meter (ppm)	LAB ANALYSIS
0.2		**SILTY SAND**, trace gravel, brown, fine grained, loose, moist.				29	1 4 5 4	NA	
0.4			-0.6						
0.6		**SILTY SAND**, trace gravel, brown, fine grained, loose, moist.	0.60 -0.7						
0.8		**GRAVELLY SAND**, reddish brown, fine to coarse grained, loose, dry to moist.	0.70	MW3-02		63	5 9 24 48	NA	Metals and PAHs
1.0									
1.2			-1.2						
1.4		Augered. No recovery.	1.20			0	NA	NA	
1.6									
1.8			-1.8						
2.0		Augered. No recovery.	1.80			0	NA	NA	
2.2									
2.4			-2.39						
2.6		**GRAVELLY SAND**, brown, coarse grained, loose, wet.	2.39			71	21 39 33 32	NA	
2.8									
3.0			-3						
3.2		Augered till 6.09m. The walls caved in to 3.04m.	3.00						
3.4									
3.6									

WELL COMPLETION DETAIL

Casing Type: Flush Mount
Ground Level to TOR: 0.05



DRILLING DRILLED BY Nova Drilling **LOGGED BY** David Panza & Holly Bouma

DRILLING DRILL METHOD CME55 **CHECKED BY** Randy Fancey

DRILL DATE(S) 07-Jan-2025

(Continued Next Page)

BOREHOLE/MONITORING WELL ID: MW-3

PROJECT NUMBER 30235902 **CLIENT** Build Nova Scotia

PROJECT NAME Phase I/II ESA, Former Silica Lake Mine **PROJECT LOCATION** Castlereagh, Colchester County, Nova Scotia

DEPTH (m)	GRAPHIC LOG	SUBSURFACE PROFILE	ELEVATION (m) DEPTH (m bgs)	SAMPLE ID	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	Organic Vapour Meter (ppm)	LAB ANALYSIS	WELL COMPLETION DETAIL	DEPTH (m)
3.8		Augered till 6.09m. The walls caved in to 3.04m. *(continued)*									3.8
4.0											4.0
4.2											4.2
4.4											4.4
4.6						0	NA	NA			4.6
4.8											4.8
5.0											5.0
5.2											5.2
5.4											5.4
5.6											5.6
5.8											5.8
6.0			-6.1								6.0
		End of Borehole at 6.10 m bgs	6.10								

DRILLING DRILLED BY Nova Drilling **LOGGED BY** David Panza & Holly Bouma

DRILLING DRILL METHOD CME55 **CHECKED BY** Randy Fancey

DRILL DATE(S) 07-Jan-2025

ARCADIS

Hand Auger, Surface Soil and Sediment Sample Logs
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Sample Locations	Sample Identification	Depth (mbgs)	Collection Method	Description
Hand Auger Holes				
HA1	HA1-1	0.00-0.30	Hand auger/shove/trowel	Silty sand, organics, trace clay, brown, moist, loose
	HA1-2	0.30-0.46	Hand auger/shove/trowel	Silty sand, silicates, brown, wet, loose
	HA1-3	0.41-0.61	Hand auger/shove/trowel	Sedimentary layers, black-grey to white, clayey fine silt, wet
HA2	HA2-1	0.00-0.51	Hand auger/shove/trowel	Silty sand, organics, pieces of silicate rock, dark brown, moist, loose
	HA2-2	0.51	Hand auger/shove/trowel	Silty sand, coarse, pieces of silicate rock, brown, moist, loose, pieces of red brick at 0.3 m.
	HA2-3	0.61-0.76	Hand auger/shove/trowel	Sedimentary layers, black-grey to white, clayey fine silt, wet
HA3	HA3-1	0.00-0.46	Hand auger/shove/trowel	Organic, silty gravel (large rocks), dark brown, wet, soft
HA4	HA4-1	0.00-0.60	Drilled/split spoon	Silty sand, fine, trace gravel, brown with flecks of black, moist, loose
	HA4-2	0.60-1.11	Drilled/split spoon	Silty sand, coarse, trace gravel, brown with flecks of black, moist, loose
HA5	HA5-1	0.00-0.60	Drilled/split spoon	Silty sand, fine, some gravel, brown, moist, loose
	HA5-2	0.60-1.18	Drilled/split spoon	Sand, fine to coarse, some gravel, greyish brown, moist, loose
HA6	HA6-1	0.00-0.60	Drilled/split spoon	Silty sand, fine, brown, moist, loose
	HA6-2	0.60-1.08	Drilled/split spoon	Silty sand, some gravel, fine to coarse, brown, moist, loose
Surface Soil Samples				
SS1	SS1	0.00-0.50	Shovel/trowel	Organic, dark brown, wet, soft
SS2	SS2	0.00-0.15	Shovel/trowel	Silty sand, coarse, some gravel, brown, moist, loose
SS3	SS3	0.00-0.15	Shovel/trowel	Silty sand, coarse, some gravel, brown, moist, loose
SS4	SS4	0.00-0.15	Shovel/trowel	Sedimentary layers, black-grey to white, some silt, moist
Sediment Samples				
SED1	SED1	0.00-0.15	Shovel/trowel	Light grey silt like material (presumably diatomite)
SED2	SED2	0.00-0.15	Shovel/trowel	White silt like material to brown silty sand and some gravel (stratified). White material resembles was observed as sedimentary deposits to pebbles, possible diatomite or ash.
SED3	SED3	0.00-0.15	Shovel/trowel	Brown to black silty sand and gravel, with some organics and pieces of red brick.

HA: Hand Auger
SS: Soil Sample
SED: Sediment
mbgs: Meters below ground surface or bottom of lake (for sedimet)

Appendix C

Certificates of Analysis

Your Project #: 30235902-01
Site Location: SILICA LAKE MINE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/16
Report #: R8471242
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C501654
Received: 2025/01/08, 12:07

Sample Matrix: Sediment
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Chloride in Soil by Auto. Colourimetry	3	N/A	2025/01/15	ATL SOP 00014	SM 24 4500-Cl- E m
Conductance - soil	3	2025/01/14	2025/01/14	ATL SOP 00004	SM 24 2510B m
Metals Solids Acid Extr. ICPMS	3	2025/01/10	2025/01/10	ATL SOP 00058	EPA 6020B R2 m
Moisture	3	N/A	2025/01/09	ATL SOP 00001	OMOE Handbook 1983 m
Nitrogen Ammonia - soil (as N)	3	2025/01/09	2025/01/10	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	3	2025/01/14	2025/01/15	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite by auto colourimetry	3	2025/01/14	2025/01/15	ATL SOP 00017	SM 24 4500-NO2- B m
pH (5:1 DI Water Extract)	3	2025/01/14	2025/01/14	ATL SOP 00003	SM 24 4500-H+ B m
Phosphorus - ortho by auto Colourimetry	3	2025/01/14	2025/01/15	ATL SOP 00021	SM 24 4500-P E m
Sulphate in Soil by Auto Colourimetry	3	2025/01/14	2025/01/15	ATL SOP 00023	ASTM D516-16 m

Sample Matrix: Surface Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Carbonate, Bicarbonate and Hydroxide	1	N/A	2025/01/10	N/A	SM 24 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	2	N/A	2025/01/13	N/A	SM 24 4500-CO2 D
Alkalinity	2	N/A	2025/01/10	ATL SOP 00142	SM 24 2320 B
Alkalinity	1	N/A	2025/01/09	ATL SOP 00142	SM 24 2320 B
Chloride	3	N/A	2025/01/13	ATL SOP 00014	SM 24 4500-Cl- E m
Colour	3	N/A	2025/01/13	ATL SOP 00020	SM 24 2120C m
Conductance - water	2	N/A	2025/01/10	ATL SOP 00004	SM 24 2510B m
Conductance - water	1	N/A	2025/01/09	ATL SOP 00004	SM 24 2510B m
Hardness (calculated as CaCO3)	3	N/A	2025/01/13	ATL SOP 00048	Auto Calc
Metals Water Total MS	3	2025/01/10	2025/01/10	ATL SOP 00058	EPA 6020B R2 m
Ion Balance (% Difference)	3	N/A	2025/01/13	N/A	Auto Calc.
Anion and Cation Sum	3	N/A	2025/01/13	N/A	Auto Calc.
Nitrogen Ammonia - water	2	N/A	2025/01/10	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen Ammonia - water	1	N/A	2025/01/11	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	3	N/A	2025/01/13	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	3	N/A	2025/01/13	ATL SOP 00017	SM 24 4500-NO2- B m
Nitrogen - Nitrate (as N)	3	N/A	2025/01/14	ATL SOP 00018	ASTM D3867-16

Your Project #: 30235902-01
Site Location: SILICA LAKE MINE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/16
Report #: R8471242
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C501654
Received: 2025/01/08, 12:07

Sample Matrix: Surface Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
pH (1)	2	N/A	2025/01/10	ATL SOP 00003	SM 24 4500-H+ B m
pH (1)	1	N/A	2025/01/09	ATL SOP 00003	SM 24 4500-H+ B m
Phosphorus - ortho	3	N/A	2025/01/13	ATL SOP 00021	SM 24 4500-P E m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2025/01/13	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	3	N/A	2025/01/13	ATL SOP 00049	Auto Calc.
Reactive Silica	3	N/A	2025/01/13	ATL SOP 00022	EPA 366.0 m
Sulphate	3	N/A	2025/01/13	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	3	N/A	2025/01/13	N/A	Auto Calc.
Organic carbon - Total (TOC) (2)	3	N/A	2025/01/13	ATL SOP 00203	SM 24 5310B m
Turbidity	3	N/A	2025/01/13	ATL SOP 00011	EPA 180.1 R2 m

Remarks:

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

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

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) The APHA Standard Method requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this

Your Project #: 30235902-01
Site Location: SILICA LAKE MINE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/16
Report #: R8471242
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C501654

Received: 2025/01/08, 12:07

report are reported past the APHA Standard Method holding time.
(2) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Marie Muise, Key Account Specialist
Email: Marie.MUISE@bureauveritas.com
Phone# (902)420-0203 Ext:253

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Suzanne Rogers, General Manager responsible for Nova Scotia Environmental laboratory operations.

Bureau Veritas Job #: C501654
Report Date: 2025/01/16

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE MINE
Sampler Initials: RS

RESULTS OF ANALYSES OF SEDIMENT

Bureau Veritas ID		ANAJ19		ANAJ20		ANAJ21		
Sampling Date		2024/12/20		2024/12/20		2024/12/20		
COC Number		N/A		N/A		N/A		
	UNITS	SED1	RDL	SED2	RDL	SED3	RDL	QC Batch
Inorganics								
Ammonia-N	mg/kg	1.4 (1)	0.57	1.1	0.62	2.1	0.40	9856742
Chloride (Cl-)	mg/kg	6.2	5.0	6.3	5.0	6.0	5.0	9858562
Conductivity	uS/cm	17	1.0	18	1.0	26	1.0	9858594
Moisture	%	52	1.0	55	1.0	33	1.0	9856016
Nitrate + Nitrite (N)	mg/kg	0.43 (2)	0.30	0.38 (2)	0.30	0.41 (2)	0.30	9858566
Nitrite (N)	mg/kg	<0.050	0.050	<0.050	0.050	<0.050	0.050	9858568
Orthophosphate (P)	mg/kg	0.079	0.050	0.19	0.050	0.098	0.050	9858565
Soluble (5:1) pH	pH	4.89	N/A	5.57	N/A	4.93	N/A	9858590
Sulphate (SO4)	mg/kg	<10	10	19	10	25	10	9858563

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Poor duplicate agreement due to sample inhomogeneity.
(2) Elevated reporting limit due to blank performance.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE MINE
Sampler Initials: RS

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Bureau Veritas ID		ANAJ19	ANAJ20	ANAJ21		
Sampling Date		2024/12/20	2024/12/20	2024/12/20		
COC Number		N/A	N/A	N/A		
	UNITS	SED1	SED2	SED3	RDL	QC Batch
Metals						
Acid Extractable Aluminum (Al)	mg/kg	7900	1900	9900	10	9857157
Acid Extractable Antimony (Sb)	mg/kg	<2.0	71	<2.0	2.0	9857157
Acid Extractable Arsenic (As)	mg/kg	<2.0	5.3	<2.0	2.0	9857157
Acid Extractable Barium (Ba)	mg/kg	96	52	48	5.0	9857157
Acid Extractable Beryllium (Be)	mg/kg	0.59	<0.50	<0.50	0.50	9857157
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	2.0	9857157
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	50	9857157
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	0.30	9857157
Acid Extractable Chromium (Cr)	mg/kg	5.7	5.7	18	2.0	9857157
Acid Extractable Cobalt (Co)	mg/kg	2.0	2.6	7.1	1.0	9857157
Acid Extractable Copper (Cu)	mg/kg	16	220	21	2.0	9857157
Acid Extractable Iron (Fe)	mg/kg	3000	26000	15000	50	9857157
Acid Extractable Lead (Pb)	mg/kg	16	950	28	0.50	9857157
Acid Extractable Lithium (Li)	mg/kg	2.6	<2.0	14	2.0	9857157
Acid Extractable Manganese (Mn)	mg/kg	45	130	230	2.0	9857157
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	0.10	9857157
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	2.0	9857157
Acid Extractable Nickel (Ni)	mg/kg	4.6	4.5	15	2.0	9857157
Acid Extractable Rubidium (Rb)	mg/kg	3.1	<2.0	6.3	2.0	9857157
Acid Extractable Selenium (Se)	mg/kg	<0.50	<0.50	<0.50	0.50	9857157
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	0.50	9857157
Acid Extractable Strontium (Sr)	mg/kg	5.3	<5.0	13	5.0	9857157
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	0.10	9857157
Acid Extractable Tin (Sn)	mg/kg	1.3	30	2.9	1.0	9857157
Acid Extractable Uranium (U)	mg/kg	1.1	0.28	0.50	0.10	9857157
Acid Extractable Vanadium (V)	mg/kg	12	15	27	2.0	9857157
Acid Extractable Zinc (Zn)	mg/kg	36	65	58	5.0	9857157

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Bureau Veritas Job #: C501654
Report Date: 2025/01/16

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE MINE
Sampler Initials: RS

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		ANAJ16		ANAJ17		ANAJ18		
Sampling Date		2024/12/20		2024/12/20		2024/12/20		
COC Number		N/A		N/A		N/A		
	UNITS	SW1	RDL	SW2	QC Batch	SW3	RDL	QC Batch
Calculated Parameters								
Anion Sum	me/L	0.230	N/A	0.220	9855803	0.240	N/A	9855803
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	2.4	1.0	3.4	9855799	3.3	1.0	9855799
Calculated TDS	mg/L	23	1.0	17	9855798	18	1.0	9855798
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	9855799	<1.0	1.0	9855799
Cation Sum	me/L	0.230	N/A	0.160	9855803	0.160	N/A	9855803
Hardness (CaCO3)	mg/L	4.5	1.0	3.0	9855801	3.5	1.0	9855801
Ion Balance (% Difference)	%	0.00	N/A	15.8	9855802	20.0	N/A	9855802
Langelier Index (@ 20C)	N/A	-5.06		-4.61	9855796	-4.61		9855796
Langelier Index (@ 4C)	N/A	-5.31		-4.86	9855797	-4.86		9855797
Nitrate (N)	mg/L	0.065	0.050	0.11	9855804	0.11	0.050	9855804
Saturation pH (@ 20C)	N/A	10.8		10.9	9855796	10.8		9855796
Saturation pH (@ 4C)	N/A	11.1		11.1	9855797	11.1		9855797
Inorganics								
Total Alkalinity (Total as CaCO3)	mg/L	2.4	2.0	3.4	9857241	3.3	2.0	9856530
Dissolved Chloride (Cl-)	mg/L	3.7	1.0	3.2	9857018	3.1	1.0	9857018
Colour	TCU	55	10	32	9857165	30	5.0	9857165
Nitrate + Nitrite (N)	mg/L	0.065	0.050	0.11	9857168	0.11	0.050	9857168
Nitrite (N)	mg/L	<0.010	0.010	<0.010	9857169	<0.010	0.010	9857169
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	0.17	9856516	<0.050	0.050	9856516
Total Organic Carbon (C)	mg/L	8.3	0.50	3.7	9857832	3.0	0.50	9857832
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	9857166	<0.010	0.010	9857166
pH	pH	5.77		6.26	9857238	6.21		9856527
Reactive Silica (SiO2)	mg/L	8.7	0.50	5.2	9857164	4.9	0.50	9857164
Dissolved Sulphate (SO4)	mg/L	3.5	2.0	2.7	9857163	3.8	2.0	9857163
Turbidity	NTU	16	0.10	0.43	9857972	0.69	0.10	9857972
Conductivity	uS/cm	21	1.0	19	9857239	19	1.0	9856529

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

ELEMENTS BY ICP/MS (SURFACE WATER)

Bureau Veritas ID		ANAJ16	ANAJ17	ANAJ18		
Sampling Date		2024/12/20	2024/12/20	2024/12/20		
COC Number		N/A	N/A	N/A		
	UNITS	SW1	SW2	SW3	RDL	QC Batch
Metals						
Total Aluminum (Al)	ug/L	340	120	110	5.0	9856982
Total Antimony (Sb)	ug/L	1.8	<1.0	<1.0	1.0	9856982
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.0	9856982
Total Barium (Ba)	ug/L	20	8.3	11	1.0	9856982
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	0.10	9856982
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	2.0	9856982
Total Boron (B)	ug/L	<50	<50	<50	50	9856982
Total Cadmium (Cd)	ug/L	0.049	0.017	0.021	0.010	9856982
Total Calcium (Ca)	ug/L	1200	720	880	100	9856982
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	1.0	9856982
Total Cobalt (Co)	ug/L	0.64	<0.40	<0.40	0.40	9856982
Total Copper (Cu)	ug/L	5.8	<0.50	2.0	0.50	9856982
Total Iron (Fe)	ug/L	1200	83	100	50	9856982
Total Lead (Pb)	ug/L	18	<0.50	1.8	0.50	9856982
Total Magnesium (Mg)	ug/L	380	290	330	100	9856982
Total Manganese (Mn)	ug/L	76	18	24	2.0	9856982
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	2.0	9856982
Total Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	2.0	9856982
Total Phosphorus (P)	ug/L	<100	<100	<100	100	9856982
Total Potassium (K)	ug/L	270	160	180	100	9856982
Total Selenium (Se)	ug/L	<0.50	<0.50	<0.50	0.50	9856982
Total Silver (Ag)	ug/L	<0.10	<0.10	<0.10	0.10	9856982
Total Sodium (Na)	ug/L	1900	1800	1900	100	9856982
Total Strontium (Sr)	ug/L	7.9	5.4	7.3	2.0	9856982
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	0.10	9856982
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	2.0	9856982
Total Titanium (Ti)	ug/L	9.8	<2.0	<2.0	2.0	9856982
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	0.10	9856982
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	2.0	9856982
Total Zinc (Zn)	ug/L	17	<5.0	<5.0	5.0	9856982

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.0°C
Package 2	4.7°C

Sample ANAJ17 [SW2] : RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample ANAJ18 [SW3] : RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9856016	KCS	RPD	Moisture	2025/01/09	8.0		%	25
9856516	MCN	Matrix Spike [ANAJ18-04]	Nitrogen (Ammonia Nitrogen)	2025/01/10		101	%	80 - 120
9856516	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2025/01/10		110	%	80 - 120
9856516	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2025/01/11	<0.050		mg/L	
9856516	MCN	RPD [ANAJ18-04]	Nitrogen (Ammonia Nitrogen)	2025/01/10	NC		%	20
9856527	M2C	Spiked Blank	pH	2025/01/09		100	%	97 - 103
9856527	M2C	RPD	pH	2025/01/09	0.48		%	N/A
9856529	M2C	Spiked Blank	Conductivity	2025/01/09		93	%	80 - 120
9856529	M2C	Method Blank	Conductivity	2025/01/09	<1.0		uS/cm	
9856529	M2C	RPD	Conductivity	2025/01/09	1.1		%	10
9856530	M2C	Spiked Blank	Total Alkalinity (Total as CaCO3)	2025/01/09		94	%	80 - 120
9856530	M2C	Method Blank	Total Alkalinity (Total as CaCO3)	2025/01/09	<2.0		mg/L	
9856530	M2C	RPD	Total Alkalinity (Total as CaCO3)	2025/01/09	1.7		%	20
9856742	MCN	Matrix Spike [ANAJ19-02]	Ammonia-N	2025/01/10		124	%	75 - 125
9856742	MCN	Spiked Blank	Ammonia-N	2025/01/10		115	%	80 - 120
9856742	MCN	Method Blank	Ammonia-N	2025/01/10	<0.25		mg/kg	
9856742	MCN	RPD [ANAJ19-02]	Ammonia-N	2025/01/10	NC		%	30
9856982	MTZ	Matrix Spike	Total Aluminum (Al)	2025/01/10		96	%	80 - 120
			Total Antimony (Sb)	2025/01/10		99	%	80 - 120
			Total Arsenic (As)	2025/01/10		97	%	80 - 120
			Total Barium (Ba)	2025/01/10		98	%	80 - 120
			Total Beryllium (Be)	2025/01/10		101	%	80 - 120
			Total Bismuth (Bi)	2025/01/10		102	%	80 - 120
			Total Boron (B)	2025/01/10		99	%	80 - 120
			Total Cadmium (Cd)	2025/01/10		98	%	80 - 120
			Total Calcium (Ca)	2025/01/10		97	%	80 - 120
			Total Chromium (Cr)	2025/01/10		99	%	80 - 120
			Total Cobalt (Co)	2025/01/10		97	%	80 - 120
			Total Copper (Cu)	2025/01/10		97	%	80 - 120
			Total Iron (Fe)	2025/01/10		100	%	80 - 120
			Total Lead (Pb)	2025/01/10		100	%	80 - 120
			Total Magnesium (Mg)	2025/01/10		104	%	80 - 120
			Total Manganese (Mn)	2025/01/10		98	%	80 - 120
			Total Molybdenum (Mo)	2025/01/10		104	%	80 - 120
			Total Nickel (Ni)	2025/01/10		98	%	80 - 120
			Total Phosphorus (P)	2025/01/10		103	%	80 - 120
			Total Potassium (K)	2025/01/10		98	%	80 - 120
			Total Selenium (Se)	2025/01/10		97	%	80 - 120
			Total Silver (Ag)	2025/01/10		97	%	80 - 120
			Total Sodium (Na)	2025/01/10		99	%	80 - 120
			Total Strontium (Sr)	2025/01/10		99	%	80 - 120
			Total Thallium (Tl)	2025/01/10		101	%	80 - 120
			Total Tin (Sn)	2025/01/10		95	%	80 - 120
			Total Titanium (Ti)	2025/01/10		101	%	80 - 120
			Total Uranium (U)	2025/01/10		107	%	80 - 120
			Total Vanadium (V)	2025/01/10		101	%	80 - 120
			Total Zinc (Zn)	2025/01/10		98	%	80 - 120
9856982	MTZ	Spiked Blank	Total Aluminum (Al)	2025/01/10		100	%	80 - 120
			Total Antimony (Sb)	2025/01/10		102	%	80 - 120
			Total Arsenic (As)	2025/01/10		100	%	80 - 120
			Total Barium (Ba)	2025/01/10		97	%	80 - 120
			Total Beryllium (Be)	2025/01/10		103	%	80 - 120
			Total Bismuth (Bi)	2025/01/10		106	%	80 - 120

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Boron (B)	2025/01/10		103	%	80 - 120
			Total Cadmium (Cd)	2025/01/10		98	%	80 - 120
			Total Calcium (Ca)	2025/01/10		100	%	80 - 120
			Total Chromium (Cr)	2025/01/10		100	%	80 - 120
			Total Cobalt (Co)	2025/01/10		99	%	80 - 120
			Total Copper (Cu)	2025/01/10		99	%	80 - 120
			Total Iron (Fe)	2025/01/10		103	%	80 - 120
			Total Lead (Pb)	2025/01/10		102	%	80 - 120
			Total Magnesium (Mg)	2025/01/10		106	%	80 - 120
			Total Manganese (Mn)	2025/01/10		100	%	80 - 120
			Total Molybdenum (Mo)	2025/01/10		104	%	80 - 120
			Total Nickel (Ni)	2025/01/10		101	%	80 - 120
			Total Phosphorus (P)	2025/01/10		104	%	80 - 120
			Total Potassium (K)	2025/01/10		100	%	80 - 120
			Total Selenium (Se)	2025/01/10		98	%	80 - 120
			Total Silver (Ag)	2025/01/10		99	%	80 - 120
			Total Sodium (Na)	2025/01/10		102	%	80 - 120
			Total Strontium (Sr)	2025/01/10		100	%	80 - 120
			Total Thallium (Tl)	2025/01/10		104	%	80 - 120
			Total Tin (Sn)	2025/01/10		98	%	80 - 120
			Total Titanium (Ti)	2025/01/10		101	%	80 - 120
			Total Uranium (U)	2025/01/10		110	%	80 - 120
			Total Vanadium (V)	2025/01/10		103	%	80 - 120
			Total Zinc (Zn)	2025/01/10		100	%	80 - 120
9856982	MTZ	Method Blank	Total Aluminum (Al)	2025/01/10	<5.0		ug/L	
			Total Antimony (Sb)	2025/01/10	<1.0		ug/L	
			Total Arsenic (As)	2025/01/10	<1.0		ug/L	
			Total Barium (Ba)	2025/01/10	<1.0		ug/L	
			Total Beryllium (Be)	2025/01/10	<0.10		ug/L	
			Total Bismuth (Bi)	2025/01/10	<2.0		ug/L	
			Total Boron (B)	2025/01/10	<50		ug/L	
			Total Cadmium (Cd)	2025/01/10	<0.010		ug/L	
			Total Calcium (Ca)	2025/01/10	<100		ug/L	
			Total Chromium (Cr)	2025/01/10	<1.0		ug/L	
			Total Cobalt (Co)	2025/01/10	<0.40		ug/L	
			Total Copper (Cu)	2025/01/10	<0.50		ug/L	
			Total Iron (Fe)	2025/01/10	<50		ug/L	
			Total Lead (Pb)	2025/01/10	<0.50		ug/L	
			Total Magnesium (Mg)	2025/01/10	<100		ug/L	
			Total Manganese (Mn)	2025/01/10	<2.0		ug/L	
			Total Molybdenum (Mo)	2025/01/10	<2.0		ug/L	
			Total Nickel (Ni)	2025/01/10	<2.0		ug/L	
			Total Phosphorus (P)	2025/01/10	<100		ug/L	
			Total Potassium (K)	2025/01/10	<100		ug/L	
			Total Selenium (Se)	2025/01/10	<0.50		ug/L	
			Total Silver (Ag)	2025/01/10	<0.10		ug/L	
			Total Sodium (Na)	2025/01/10	<100		ug/L	
			Total Strontium (Sr)	2025/01/10	<2.0		ug/L	
			Total Thallium (Tl)	2025/01/10	<0.10		ug/L	
			Total Tin (Sn)	2025/01/10	<2.0		ug/L	
			Total Titanium (Ti)	2025/01/10	<2.0		ug/L	
			Total Uranium (U)	2025/01/10	<0.10		ug/L	
			Total Vanadium (V)	2025/01/10	<2.0		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Zinc (Zn)	2025/01/10	<5.0		ug/L	
9856982	MTZ	RPD	Total Aluminum (Al)	2025/01/10	NC		%	20
			Total Antimony (Sb)	2025/01/10	NC		%	20
			Total Arsenic (As)	2025/01/10	NC		%	20
			Total Barium (Ba)	2025/01/10	2.1		%	20
			Total Beryllium (Be)	2025/01/10	NC		%	20
			Total Bismuth (Bi)	2025/01/10	NC		%	20
			Total Boron (B)	2025/01/10	NC		%	20
			Total Cadmium (Cd)	2025/01/10	NC		%	20
			Total Calcium (Ca)	2025/01/10	2.7		%	20
			Total Chromium (Cr)	2025/01/10	NC		%	20
			Total Cobalt (Co)	2025/01/10	NC		%	20
			Total Copper (Cu)	2025/01/10	3.2		%	20
			Total Iron (Fe)	2025/01/10	NC		%	20
			Total Lead (Pb)	2025/01/10	NC		%	20
			Total Magnesium (Mg)	2025/01/10	1.7		%	20
			Total Manganese (Mn)	2025/01/10	2.8		%	20
			Total Molybdenum (Mo)	2025/01/10	NC		%	20
			Total Nickel (Ni)	2025/01/10	NC		%	20
			Total Phosphorus (P)	2025/01/10	0.63		%	20
			Total Potassium (K)	2025/01/10	2.1		%	20
			Total Selenium (Se)	2025/01/10	NC		%	20
			Total Silver (Ag)	2025/01/10	NC		%	20
			Total Sodium (Na)	2025/01/10	1.4		%	20
			Total Strontium (Sr)	2025/01/10	1.3		%	20
			Total Thallium (Tl)	2025/01/10	NC		%	20
			Total Tin (Sn)	2025/01/10	NC		%	20
			Total Titanium (Ti)	2025/01/10	NC		%	20
			Total Uranium (U)	2025/01/10	NC		%	20
			Total Vanadium (V)	2025/01/10	NC		%	20
			Total Zinc (Zn)	2025/01/10	2.3		%	20
9857018	EMT	Matrix Spike	Dissolved Chloride (Cl-)	2025/01/13		100	%	80 - 120
9857018	EMT	Spiked Blank	Dissolved Chloride (Cl-)	2025/01/13		100	%	80 - 120
9857018	EMT	Method Blank	Dissolved Chloride (Cl-)	2025/01/13	<1.0		mg/L	
9857018	EMT	RPD	Dissolved Chloride (Cl-)	2025/01/13	3.4		%	20
9857157	MOA	Matrix Spike [ANAJ21-01]	Acid Extractable Antimony (Sb)	2025/01/10		101	%	75 - 125
			Acid Extractable Arsenic (As)	2025/01/10		95	%	75 - 125
			Acid Extractable Barium (Ba)	2025/01/10		100	%	75 - 125
			Acid Extractable Beryllium (Be)	2025/01/10		95	%	75 - 125
			Acid Extractable Bismuth (Bi)	2025/01/10		102	%	75 - 125
			Acid Extractable Boron (B)	2025/01/10		92	%	75 - 125
			Acid Extractable Cadmium (Cd)	2025/01/10		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2025/01/10		94	%	75 - 125
			Acid Extractable Cobalt (Co)	2025/01/10		96	%	75 - 125
			Acid Extractable Copper (Cu)	2025/01/10		97	%	75 - 125
			Acid Extractable Lead (Pb)	2025/01/10		99	%	75 - 125
			Acid Extractable Lithium (Li)	2025/01/10		97	%	75 - 125
			Acid Extractable Manganese (Mn)	2025/01/10		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2025/01/10		97	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2025/01/10		103	%	75 - 125
			Acid Extractable Nickel (Ni)	2025/01/10		97	%	75 - 125
			Acid Extractable Rubidium (Rb)	2025/01/10		95	%	75 - 125
			Acid Extractable Selenium (Se)	2025/01/10		91	%	75 - 125

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Silver (Ag)	2025/01/10		97	%	75 - 125
			Acid Extractable Strontium (Sr)	2025/01/10		95	%	75 - 125
			Acid Extractable Thallium (Tl)	2025/01/10		101	%	75 - 125
			Acid Extractable Tin (Sn)	2025/01/10		101	%	75 - 125
			Acid Extractable Uranium (U)	2025/01/10		103	%	75 - 125
			Acid Extractable Vanadium (V)	2025/01/10		92	%	75 - 125
			Acid Extractable Zinc (Zn)	2025/01/10		NC	%	75 - 125
9857157	MOA	Spiked Blank	Acid Extractable Antimony (Sb)	2025/01/10		104	%	75 - 125
			Acid Extractable Arsenic (As)	2025/01/10		97	%	75 - 125
			Acid Extractable Barium (Ba)	2025/01/10		96	%	75 - 125
			Acid Extractable Beryllium (Be)	2025/01/10		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2025/01/10		102	%	75 - 125
			Acid Extractable Boron (B)	2025/01/10		99	%	75 - 125
			Acid Extractable Cadmium (Cd)	2025/01/10		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2025/01/10		98	%	75 - 125
			Acid Extractable Cobalt (Co)	2025/01/10		96	%	75 - 125
			Acid Extractable Copper (Cu)	2025/01/10		96	%	75 - 125
			Acid Extractable Lead (Pb)	2025/01/10		99	%	75 - 125
			Acid Extractable Lithium (Li)	2025/01/10		100	%	75 - 125
			Acid Extractable Manganese (Mn)	2025/01/10		97	%	75 - 125
			Acid Extractable Mercury (Hg)	2025/01/10		98	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2025/01/10		98	%	75 - 125
			Acid Extractable Nickel (Ni)	2025/01/10		96	%	75 - 125
			Acid Extractable Rubidium (Rb)	2025/01/10		97	%	75 - 125
			Acid Extractable Selenium (Se)	2025/01/10		94	%	75 - 125
			Acid Extractable Silver (Ag)	2025/01/10		98	%	75 - 125
			Acid Extractable Strontium (Sr)	2025/01/10		99	%	75 - 125
			Acid Extractable Thallium (Tl)	2025/01/10		102	%	75 - 125
			Acid Extractable Tin (Sn)	2025/01/10		99	%	75 - 125
			Acid Extractable Uranium (U)	2025/01/10		101	%	75 - 125
			Acid Extractable Vanadium (V)	2025/01/10		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2025/01/10		97	%	75 - 125
9857157	MOA	Method Blank	Acid Extractable Aluminum (Al)	2025/01/10	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2025/01/10	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2025/01/10	<0.50		mg/kg	
			Acid Extractable Bismuth (Bi)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Boron (B)	2025/01/10	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2025/01/10	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2025/01/10	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2025/01/10	<50		mg/kg	
			Acid Extractable Lead (Pb)	2025/01/10	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2025/01/10	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2025/01/10	<0.50		mg/kg	
			Acid Extractable Silver (Ag)	2025/01/10	<0.50		mg/kg	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Strontium (Sr)	2025/01/10	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2025/01/10	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2025/01/10	<1.0		mg/kg	
			Acid Extractable Uranium (U)	2025/01/10	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2025/01/10	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2025/01/10	<5.0		mg/kg	
9857157	MOA	RPD [ANAJ21-01]	Acid Extractable Aluminum (Al)	2025/01/10	6.4		%	35
			Acid Extractable Antimony (Sb)	2025/01/10	NC		%	35
			Acid Extractable Arsenic (As)	2025/01/10	NC		%	35
			Acid Extractable Barium (Ba)	2025/01/10	3.3		%	35
			Acid Extractable Beryllium (Be)	2025/01/10	NC		%	35
			Acid Extractable Bismuth (Bi)	2025/01/10	NC		%	35
			Acid Extractable Boron (B)	2025/01/10	NC		%	35
			Acid Extractable Cadmium (Cd)	2025/01/10	NC		%	35
			Acid Extractable Chromium (Cr)	2025/01/10	8.0		%	35
			Acid Extractable Cobalt (Co)	2025/01/10	9.1		%	35
			Acid Extractable Copper (Cu)	2025/01/10	16		%	35
			Acid Extractable Iron (Fe)	2025/01/10	12		%	35
			Acid Extractable Lead (Pb)	2025/01/10	9.8		%	35
			Acid Extractable Lithium (Li)	2025/01/10	4.8		%	35
			Acid Extractable Manganese (Mn)	2025/01/10	7.8		%	35
			Acid Extractable Mercury (Hg)	2025/01/10	NC		%	35
			Acid Extractable Molybdenum (Mo)	2025/01/10	NC		%	35
			Acid Extractable Nickel (Ni)	2025/01/10	4.2		%	35
			Acid Extractable Rubidium (Rb)	2025/01/10	22		%	35
			Acid Extractable Selenium (Se)	2025/01/10	NC		%	35
			Acid Extractable Silver (Ag)	2025/01/10	NC		%	35
			Acid Extractable Strontium (Sr)	2025/01/10	6.2		%	35
			Acid Extractable Thallium (Tl)	2025/01/10	NC		%	35
			Acid Extractable Tin (Sn)	2025/01/10	NC		%	35
			Acid Extractable Uranium (U)	2025/01/10	9.8		%	35
			Acid Extractable Vanadium (V)	2025/01/10	18		%	35
			Acid Extractable Zinc (Zn)	2025/01/10	0.92		%	35
9857163	EMT	Matrix Spike	Dissolved Sulphate (SO4)	2025/01/13		111	%	80 - 120
9857163	EMT	Spiked Blank	Dissolved Sulphate (SO4)	2025/01/13		101	%	80 - 120
9857163	EMT	Method Blank	Dissolved Sulphate (SO4)	2025/01/13	<2.0		mg/L	
9857163	EMT	RPD	Dissolved Sulphate (SO4)	2025/01/13	2.7		%	20
9857164	EMT	Matrix Spike	Reactive Silica (SiO2)	2025/01/13		86	%	80 - 120
9857164	EMT	Spiked Blank	Reactive Silica (SiO2)	2025/01/13		101	%	80 - 120
9857164	EMT	Method Blank	Reactive Silica (SiO2)	2025/01/13	<0.50		mg/L	
9857164	EMT	RPD	Reactive Silica (SiO2)	2025/01/13	9.9		%	20
9857165	EMT	Spiked Blank	Colour	2025/01/13		113	%	80 - 120
9857165	EMT	Method Blank	Colour	2025/01/13	<5.0		TCU	
9857165	EMT	RPD	Colour	2025/01/13	5.0		%	20
9857166	EMT	Matrix Spike	Orthophosphate (P)	2025/01/13		93	%	80 - 120
9857166	EMT	Spiked Blank	Orthophosphate (P)	2025/01/13		93	%	80 - 120
9857166	EMT	Method Blank	Orthophosphate (P)	2025/01/13	<0.010		mg/L	
9857166	EMT	RPD	Orthophosphate (P)	2025/01/13	NC		%	20
9857168	EMT	Matrix Spike	Nitrate + Nitrite (N)	2025/01/13		97	%	80 - 120
9857168	EMT	Spiked Blank	Nitrate + Nitrite (N)	2025/01/13		101	%	80 - 120
9857168	EMT	Method Blank	Nitrate + Nitrite (N)	2025/01/14	<0.050		mg/L	
9857168	EMT	RPD	Nitrate + Nitrite (N)	2025/01/13	2.6		%	20
9857169	EMT	Matrix Spike	Nitrite (N)	2025/01/13		81	%	80 - 120

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9857169	EMT	Spiked Blank	Nitrite (N)	2025/01/13		91	%	80 - 120
9857169	EMT	Method Blank	Nitrite (N)	2025/01/13	<0.010		mg/L	
9857169	EMT	RPD	Nitrite (N)	2025/01/13	NC		%	20
9857238	M2C	Spiked Blank	pH	2025/01/10		100	%	97 - 103
9857238	M2C	RPD	pH	2025/01/10	1.4		%	N/A
9857239	M2C	Spiked Blank	Conductivity	2025/01/10		91	%	80 - 120
9857239	M2C	Method Blank	Conductivity	2025/01/10	<1.0		uS/cm	
9857239	M2C	RPD	Conductivity	2025/01/10	0.29		%	10
9857241	M2C	Spiked Blank	Total Alkalinity (Total as CaCO3)	2025/01/10		94	%	80 - 120
9857241	M2C	Method Blank	Total Alkalinity (Total as CaCO3)	2025/01/10	<2.0		mg/L	
9857241	M2C	RPD	Total Alkalinity (Total as CaCO3)	2025/01/10	2.8		%	20
9857832	ACK	Matrix Spike	Total Organic Carbon (C)	2025/01/13		100	%	85 - 115
9857832	ACK	Spiked Blank	Total Organic Carbon (C)	2025/01/13		98	%	80 - 120
9857832	ACK	Method Blank	Total Organic Carbon (C)	2025/01/13	<0.50		mg/L	
9857832	ACK	RPD	Total Organic Carbon (C)	2025/01/13	5.1		%	15
9857972	M2C	QC Standard	Turbidity	2025/01/13		100	%	80 - 120
9857972	M2C	Spiked Blank	Turbidity	2025/01/13		100	%	80 - 120
9857972	M2C	Method Blank	Turbidity	2025/01/13	<0.10		NTU	
9857972	M2C	RPD	Turbidity	2025/01/13	5.0		%	20
9858562	EMT	Matrix Spike [ANAJ21-01]	Chloride (Cl-)	2025/01/15		91	%	75 - 125
9858562	EMT	Spiked Blank	Chloride (Cl-)	2025/01/15		92	%	80 - 120
9858562	EMT	Method Blank	Chloride (Cl-)	2025/01/15	<5.0		mg/kg	
9858562	EMT	RPD [ANAJ21-01]	Chloride (Cl-)	2025/01/15	16		%	30
9858563	EMT	Matrix Spike [ANAJ21-01]	Sulphate (SO4)	2025/01/15		103	%	75 - 125
9858563	EMT	Spiked Blank	Sulphate (SO4)	2025/01/15		95	%	80 - 120
9858563	EMT	Method Blank	Sulphate (SO4)	2025/01/15	<10		mg/kg	
9858563	EMT	RPD [ANAJ21-01]	Sulphate (SO4)	2025/01/15	14		%	30
9858565	EMT	Matrix Spike [ANAJ21-01]	Orthophosphate (P)	2025/01/15		90	%	75 - 125
9858565	EMT	Spiked Blank	Orthophosphate (P)	2025/01/15		91	%	80 - 120
9858565	EMT	Method Blank	Orthophosphate (P)	2025/01/15	<0.050		mg/kg	
9858565	EMT	RPD [ANAJ21-01]	Orthophosphate (P)	2025/01/15	6.0		%	30
9858566	EMT	Matrix Spike [ANAJ21-01]	Nitrate + Nitrite (N)	2025/01/15		88	%	75 - 125
9858566	EMT	Spiked Blank	Nitrate + Nitrite (N)	2025/01/15		95	%	80 - 120
9858566	EMT	Method Blank	Nitrate + Nitrite (N)	2025/01/15	0.28, RDL=0.25 (1)		mg/kg	
9858566	EMT	RPD [ANAJ21-01]	Nitrate + Nitrite (N)	2025/01/15	NC (2)		%	30
9858568	EMT	Matrix Spike [ANAJ21-01]	Nitrite (N)	2025/01/15		90	%	75 - 125
9858568	EMT	Spiked Blank	Nitrite (N)	2025/01/15		101	%	80 - 120
9858568	EMT	Method Blank	Nitrite (N)	2025/01/15	<0.050		mg/kg	
9858568	EMT	RPD [ANAJ21-01]	Nitrite (N)	2025/01/15	NC		%	30
9858590	SSI	RPD [ANAJ21-01]	Soluble (5:1) pH	2025/01/14	2.2		%	N/A

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9858594	SSI	RPD [ANAJ21-01]	Conductivity	2025/01/14	17		%	20

N/A = Not Applicable

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

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

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

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

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

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

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

(1) Elevated blank result due to lab contamination.

(2) Elevated reporting limit due to blank performance.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Bureau Veritas Job #: C501654
Report Date: 2025/01/16

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE MINE
Sampler Initials: RS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ernlie Publicover, Scientific Specialist

Janah Rhyno, Scientific Specialist

Phil Deveau, Scientific Specialist (Organics)

Bureau Veritas Certified by Janah Rhyno, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Suzanne Rogers, General Manager responsible for Nova Scotia Environmental laboratory operations.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Your Project #: 30235902-01
Site Location: SILICA LAKE MINE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/14
Report #: R8470288
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C501903
Received: 2025/01/08, 12:07

Sample Matrix: Soil
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Benzo(b/j)fluoranthene Sum (soil)	6	N/A	2025/01/14	N/A	Auto Calc.
Metals Solids Acid Extr. ICPMS	6	2025/01/13	2025/01/13	ATL SOP 00058	EPA 6020B R2 m
Moisture	6	N/A	2025/01/13	ATL SOP 00001	OMOE Handbook 1983 m
PAH Compounds by GCMS (SIM) (1)	2	2025/01/13	2025/01/13	ATL SOP 00102	EPA 8270E R6 m
PAH Compounds by GCMS (SIM) (1)	4	2025/01/13	2025/01/14	ATL SOP 00102	EPA 8270E R6 m

Remarks:

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

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

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Your Project #: 30235902-01
Site Location: SILICA LAKE MINE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/14
Report #: R8470288
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C501903
Received: 2025/01/08, 12:07

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Marie Muise, Key Account Specialist
Email: Marie.MUISE@bureauveritas.com
Phone# (902)420-0203 Ext:253

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Suzanne Rogers, General Manager responsible for Nova Scotia Environmental laboratory operations.

Bureau Veritas Job #: C501903
Report Date: 2025/01/14

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE MINE
Sampler Initials: DP

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		ANAS05	ANAS07	ANAS09	ANAS10	ANAS11	ANAS12		
Sampling Date		2025/01/07 14:29	2025/01/07 15:30	2025/01/07 11:20	2025/01/07 13:20	2025/01/07 13:05	2025/01/07 13:35		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	UNITS	**MW1-02**	**MW2-01**	**MW3-02**	**HA4-02**	**HA5-01**	**HA6-02**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	47	55	17	16	15	7.1	1.0	9857000

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Bureau Veritas Job #: C501903
Report Date: 2025/01/14

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE MINE
Sampler Initials: DP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		ANAS05	ANAS07	ANAS09	ANAS10	ANAS11	ANAS12		
Sampling Date		2025/01/07 14:29	2025/01/07 15:30	2025/01/07 11:20	2025/01/07 13:20	2025/01/07 13:05	2025/01/07 13:35		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	UNITS	**MW1-02**	**MW2-01**	**MW3-02**	**HA4-02**	**HA5-01**	**HA6-02**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	12000	8100	16000	15000	21000	16000	10	9857830
Acid Extractable Antimony (Sb)	mg/kg	4.8	2.3	<2.0	<2.0	<2.0	<2.0	2.0	9857830
Acid Extractable Arsenic (As)	mg/kg	<2.0	3.4	4.3	3.7	5.3	4.6	2.0	9857830
Acid Extractable Barium (Ba)	mg/kg	72	73	26	21	42	32	5.0	9857830
Acid Extractable Beryllium (Be)	mg/kg	<0.50	0.70	<0.50	<0.50	<0.50	<0.50	0.50	9857830
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	9857830
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	50	9857830
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.62	<0.30	<0.30	<0.30	<0.30	0.30	9857830
Acid Extractable Chromium (Cr)	mg/kg	22	9.9	27	30	33	41	2.0	9857830
Acid Extractable Cobalt (Co)	mg/kg	8.8	5.8	12	12	15	15	1.0	9857830
Acid Extractable Copper (Cu)	mg/kg	38	33	44	33	30	59	2.0	9857830
Acid Extractable Iron (Fe)	mg/kg	15000	13000	26000	26000	25000	29000	50	9857830
Acid Extractable Lead (Pb)	mg/kg	53	280	36	33	57	30	0.50	9857830
Acid Extractable Lithium (Li)	mg/kg	13	6.8	17	18	20	19	2.0	9857830
Acid Extractable Manganese (Mn)	mg/kg	240	270	440	440	880	470	2.0	9857830
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	9857830
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	9857830
Acid Extractable Nickel (Ni)	mg/kg	15	9.6	19	22	19	23	2.0	9857830
Acid Extractable Rubidium (Rb)	mg/kg	5.6	5.6	7.1	5.5	13	10	2.0	9857830
Acid Extractable Selenium (Se)	mg/kg	0.61	1.3	<0.50	<0.50	<0.50	<0.50	0.50	9857830
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	9857830
Acid Extractable Strontium (Sr)	mg/kg	14	11	18	23	13	25	5.0	9857830
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.15	<0.10	0.10	9857830
Acid Extractable Tin (Sn)	mg/kg	11	3.8	<1.0	<1.0	<1.0	<1.0	1.0	9857830
Acid Extractable Uranium (U)	mg/kg	0.95	1.0	0.66	0.46	0.62	0.44	0.10	9857830
Acid Extractable Vanadium (V)	mg/kg	40	21	43	47	37	62	2.0	9857830
Acid Extractable Zinc (Zn)	mg/kg	83	130	97	82	110	110	5.0	9857830

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		ANAS05	ANAS07	ANAS09	ANAS10	ANAS11	ANAS12		
Sampling Date		2025/01/07 14:29	2025/01/07 15:30	2025/01/07 11:20	2025/01/07 13:20	2025/01/07 13:05	2025/01/07 13:35		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A		
	UNITS	MW1-02	MW2-01	MW3-02	HA4-02	HA5-01	HA6-02	RDL	QC Batch
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9857804
2-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Acenaphthene	mg/kg	<0.010	0.075	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Acenaphthylene	mg/kg	0.056	0.18	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Anthracene	mg/kg	0.077	0.63	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Benzo(a)anthracene	mg/kg	0.34	1.5	0.015	0.013	0.014	<0.010	0.010	9857804
Benzo(a)pyrene	mg/kg	0.34	1.6	<0.010	0.012	0.018	<0.010	0.010	9857804
Benzo(b)fluoranthene	mg/kg	0.27	1.2	0.013	<0.010	0.014	<0.010	0.010	9857804
Benzo(b/j)fluoranthene	mg/kg	0.44	2.0	<0.020	<0.020	<0.020	<0.020	0.020	9856576
Benzo(g,h,i)perylene	mg/kg	0.20	0.73	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Benzo(j)fluoranthene	mg/kg	0.17	0.78	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Benzo(k)fluoranthene	mg/kg	0.15	0.74	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Chrysene	mg/kg	0.41	1.9	0.016	0.015	0.019	<0.010	0.010	9857804
Dibenzo(a,h)anthracene	mg/kg	0.039	0.17	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Fluoranthene	mg/kg	0.96	4.9	0.027	0.025	0.025	<0.010	0.010	9857804
Fluorene	mg/kg	0.022	0.26	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Indeno(1,2,3-cd)pyrene	mg/kg	0.17	0.74	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Naphthalene	mg/kg	<0.010	0.035	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Perylene	mg/kg	0.21	0.30	<0.010	<0.010	<0.010	<0.010	0.010	9857804
Phenanthrene	mg/kg	0.43	3.9	<0.010	<0.010	0.012	<0.010	0.010	9857804
Pyrene	mg/kg	0.75	3.8	0.024	0.020	0.023	<0.010	0.010	9857804
Surrogate Recovery (%)									
D10-Anthracene	%	115	108	113	112	112	111		9857804
D14-Terphenyl (FS)	%	110	102	109	108	110	107		9857804
D8-Acenaphthylene	%	102	98	98	98	98	97		9857804

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.0°C
Package 2	4.7°C

Results relate only to the items tested.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9857000	GEP	RPD [ANAS07-02]	Moisture	2025/01/13	1.3		%	25
9857804	EPA	Matrix Spike [ANAS05-02]	D10-Anthracene	2025/01/13		116	%	50 - 130
			D14-Terphenyl (FS)	2025/01/13		111	%	50 - 130
			D8-Acenaphthylene	2025/01/13		107	%	50 - 130
			1-Methylnaphthalene	2025/01/13		96	%	50 - 130
			2-Methylnaphthalene	2025/01/13		107	%	50 - 130
			Acenaphthene	2025/01/13		97	%	50 - 130
			Acenaphthylene	2025/01/13		101	%	50 - 130
			Anthracene	2025/01/13		99	%	50 - 130
			Benzo(a)anthracene	2025/01/13		92	%	50 - 130
			Benzo(a)pyrene	2025/01/13		93	%	50 - 130
			Benzo(b)fluoranthene	2025/01/13		88	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/13		90	%	50 - 130
			Benzo(j)fluoranthene	2025/01/13		95	%	50 - 130
			Benzo(k)fluoranthene	2025/01/13		91	%	50 - 130
			Chrysene	2025/01/13		89	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/13		99	%	50 - 130
			Fluoranthene	2025/01/13		79	%	50 - 130
			Fluorene	2025/01/13		98	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/13		92	%	50 - 130
			Naphthalene	2025/01/13		103	%	50 - 130
			Perylene	2025/01/13		88	%	50 - 130
			Phenanthrene	2025/01/13		92	%	50 - 130
			Pyrene	2025/01/13		77	%	50 - 130
9857804	EPA	Spiked Blank	D10-Anthracene	2025/01/13		115	%	50 - 130
			D14-Terphenyl (FS)	2025/01/13		112	%	50 - 130
			D8-Acenaphthylene	2025/01/13		103	%	50 - 130
			1-Methylnaphthalene	2025/01/13		95	%	50 - 130
			2-Methylnaphthalene	2025/01/13		105	%	50 - 130
			Acenaphthene	2025/01/13		96	%	50 - 130
			Acenaphthylene	2025/01/13		100	%	50 - 130
			Anthracene	2025/01/13		102	%	50 - 130
			Benzo(a)anthracene	2025/01/13		98	%	50 - 130
			Benzo(a)pyrene	2025/01/13		105	%	50 - 130
			Benzo(b)fluoranthene	2025/01/13		100	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/13		98	%	50 - 130
			Benzo(j)fluoranthene	2025/01/13		108	%	50 - 130
			Benzo(k)fluoranthene	2025/01/13		104	%	50 - 130
			Chrysene	2025/01/13		104	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/13		103	%	50 - 130
			Fluoranthene	2025/01/13		101	%	50 - 130
			Fluorene	2025/01/13		95	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/13		99	%	50 - 130
			Naphthalene	2025/01/13		102	%	50 - 130
			Perylene	2025/01/13		100	%	50 - 130
			Phenanthrene	2025/01/13		105	%	50 - 130
			Pyrene	2025/01/13		98	%	50 - 130
9857804	EPA	Method Blank	D10-Anthracene	2025/01/13		105	%	50 - 130
			D14-Terphenyl (FS)	2025/01/13		107	%	50 - 130
			D8-Acenaphthylene	2025/01/13		101	%	50 - 130
			1-Methylnaphthalene	2025/01/13	<0.010		mg/kg	
			2-Methylnaphthalene	2025/01/13	<0.010		mg/kg	
			Acenaphthene	2025/01/13	<0.010		mg/kg	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthylene	2025/01/13	<0.010		mg/kg	
			Anthracene	2025/01/13	<0.010		mg/kg	
			Benzo(a)anthracene	2025/01/13	<0.010		mg/kg	
			Benzo(a)pyrene	2025/01/13	<0.010		mg/kg	
			Benzo(b)fluoranthene	2025/01/13	<0.010		mg/kg	
			Benzo(g,h,i)perylene	2025/01/13	<0.010		mg/kg	
			Benzo(j)fluoranthene	2025/01/13	<0.010		mg/kg	
			Benzo(k)fluoranthene	2025/01/13	<0.010		mg/kg	
			Chrysene	2025/01/13	<0.010		mg/kg	
			Dibenzo(a,h)anthracene	2025/01/13	<0.010		mg/kg	
			Fluoranthene	2025/01/13	<0.010		mg/kg	
			Fluorene	2025/01/13	<0.010		mg/kg	
			Indeno(1,2,3-cd)pyrene	2025/01/13	<0.010		mg/kg	
			Naphthalene	2025/01/13	<0.010		mg/kg	
			Perylene	2025/01/13	<0.010		mg/kg	
			Phenanthrene	2025/01/13	<0.010		mg/kg	
			Pyrene	2025/01/13	<0.010		mg/kg	
9857804	EPA	RPD [ANAS05-02]	1-Methylnaphthalene	2025/01/13	NC		%	50
			2-Methylnaphthalene	2025/01/13	NC		%	50
			Acenaphthene	2025/01/13	NC		%	50
			Acenaphthylene	2025/01/13	29		%	50
			Anthracene	2025/01/13	40		%	50
			Benzo(a)anthracene	2025/01/13	33		%	50
			Benzo(a)pyrene	2025/01/13	30		%	50
			Benzo(b)fluoranthene	2025/01/13	30		%	50
			Benzo(g,h,i)perylene	2025/01/13	26		%	50
			Benzo(j)fluoranthene	2025/01/13	28		%	50
			Benzo(k)fluoranthene	2025/01/13	30		%	50
			Chrysene	2025/01/13	31		%	50
			Dibenzo(a,h)anthracene	2025/01/13	30		%	50
			Fluoranthene	2025/01/13	32		%	50
			Fluorene	2025/01/13	NC		%	50
			Indeno(1,2,3-cd)pyrene	2025/01/13	28		%	50
			Naphthalene	2025/01/13	NC		%	50
			Perylene	2025/01/13	3.8		%	50
			Phenanthrene	2025/01/13	41		%	50
			Pyrene	2025/01/13	32		%	50
9857830	MOA	Matrix Spike	Acid Extractable Antimony (Sb)	2025/01/13		90	%	75 - 125
			Acid Extractable Arsenic (As)	2025/01/13		96	%	75 - 125
			Acid Extractable Barium (Ba)	2025/01/13		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2025/01/13		91	%	75 - 125
			Acid Extractable Bismuth (Bi)	2025/01/13		99	%	75 - 125
			Acid Extractable Boron (B)	2025/01/13		80	%	75 - 125
			Acid Extractable Cadmium (Cd)	2025/01/13		97	%	75 - 125
			Acid Extractable Chromium (Cr)	2025/01/13		97	%	75 - 125
			Acid Extractable Cobalt (Co)	2025/01/13		96	%	75 - 125
			Acid Extractable Copper (Cu)	2025/01/13		106	%	75 - 125
			Acid Extractable Lead (Pb)	2025/01/13		112	%	75 - 125
			Acid Extractable Lithium (Li)	2025/01/13		98	%	75 - 125
			Acid Extractable Manganese (Mn)	2025/01/13		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2025/01/13		97	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2025/01/13		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2025/01/13		97	%	75 - 125

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Rubidium (Rb)	2025/01/13		86	%	75 - 125
			Acid Extractable Selenium (Se)	2025/01/13		95	%	75 - 125
			Acid Extractable Silver (Ag)	2025/01/13		96	%	75 - 125
			Acid Extractable Strontium (Sr)	2025/01/13		NC	%	75 - 125
			Acid Extractable Thallium (Tl)	2025/01/13		98	%	75 - 125
			Acid Extractable Tin (Sn)	2025/01/13		104	%	75 - 125
			Acid Extractable Uranium (U)	2025/01/13		102	%	75 - 125
			Acid Extractable Vanadium (V)	2025/01/13		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2025/01/13		NC	%	75 - 125
9857830	MOA	Spiked Blank	Acid Extractable Antimony (Sb)	2025/01/13		94	%	75 - 125
			Acid Extractable Arsenic (As)	2025/01/13		97	%	75 - 125
			Acid Extractable Barium (Ba)	2025/01/13		87	%	75 - 125
			Acid Extractable Beryllium (Be)	2025/01/13		86	%	75 - 125
			Acid Extractable Bismuth (Bi)	2025/01/13		96	%	75 - 125
			Acid Extractable Boron (B)	2025/01/13		98	%	75 - 125
			Acid Extractable Cadmium (Cd)	2025/01/13		97	%	75 - 125
			Acid Extractable Chromium (Cr)	2025/01/13		94	%	75 - 125
			Acid Extractable Cobalt (Co)	2025/01/13		97	%	75 - 125
			Acid Extractable Copper (Cu)	2025/01/13		98	%	75 - 125
			Acid Extractable Lead (Pb)	2025/01/13		94	%	75 - 125
			Acid Extractable Lithium (Li)	2025/01/13		91	%	75 - 125
			Acid Extractable Manganese (Mn)	2025/01/13		92	%	75 - 125
			Acid Extractable Mercury (Hg)	2025/01/13		96	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2025/01/13		102	%	75 - 125
			Acid Extractable Nickel (Ni)	2025/01/13		99	%	75 - 125
			Acid Extractable Rubidium (Rb)	2025/01/13		95	%	75 - 125
			Acid Extractable Selenium (Se)	2025/01/13		95	%	75 - 125
			Acid Extractable Silver (Ag)	2025/01/13		96	%	75 - 125
			Acid Extractable Strontium (Sr)	2025/01/13		93	%	75 - 125
			Acid Extractable Thallium (Tl)	2025/01/13		99	%	75 - 125
			Acid Extractable Tin (Sn)	2025/01/13		93	%	75 - 125
			Acid Extractable Uranium (U)	2025/01/13		102	%	75 - 125
			Acid Extractable Vanadium (V)	2025/01/13		96	%	75 - 125
			Acid Extractable Zinc (Zn)	2025/01/13		97	%	75 - 125
9857830	MOA	Method Blank	Acid Extractable Aluminum (Al)	2025/01/13	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2025/01/13	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2025/01/13	<0.50		mg/kg	
			Acid Extractable Bismuth (Bi)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Boron (B)	2025/01/13	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2025/01/13	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2025/01/13	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2025/01/13	<50		mg/kg	
			Acid Extractable Lead (Pb)	2025/01/13	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2025/01/13	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2025/01/13	<2.0		mg/kg	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Selenium (Se)	2025/01/13	<0.50		mg/kg	
			Acid Extractable Silver (Ag)	2025/01/13	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2025/01/13	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2025/01/13	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2025/01/13	<1.0		mg/kg	
			Acid Extractable Uranium (U)	2025/01/13	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2025/01/13	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2025/01/13	<5.0		mg/kg	
9857830	MOA	RPD	Acid Extractable Aluminum (Al)	2025/01/13	4.0		%	35
			Acid Extractable Antimony (Sb)	2025/01/13	NC		%	35
			Acid Extractable Arsenic (As)	2025/01/13	28		%	35
			Acid Extractable Barium (Ba)	2025/01/13	6.5		%	35
			Acid Extractable Beryllium (Be)	2025/01/13	9.3		%	35
			Acid Extractable Bismuth (Bi)	2025/01/13	NC		%	35
			Acid Extractable Boron (B)	2025/01/13	NC		%	35
			Acid Extractable Cadmium (Cd)	2025/01/13	10		%	35
			Acid Extractable Chromium (Cr)	2025/01/13	4.4		%	35
			Acid Extractable Cobalt (Co)	2025/01/13	0.53		%	35
			Acid Extractable Copper (Cu)	2025/01/13	5.0		%	35
			Acid Extractable Iron (Fe)	2025/01/13	2.2		%	35
			Acid Extractable Lead (Pb)	2025/01/13	2.2		%	35
			Acid Extractable Lithium (Li)	2025/01/13	1.3		%	35
			Acid Extractable Manganese (Mn)	2025/01/13	4.1		%	35
			Acid Extractable Mercury (Hg)	2025/01/13	0.17		%	35
			Acid Extractable Molybdenum (Mo)	2025/01/13	NC		%	35
			Acid Extractable Nickel (Ni)	2025/01/13	4.9		%	35
			Acid Extractable Rubidium (Rb)	2025/01/13	1.8		%	35
			Acid Extractable Selenium (Se)	2025/01/13	7.9		%	35
			Acid Extractable Silver (Ag)	2025/01/13	NC		%	35
			Acid Extractable Strontium (Sr)	2025/01/13	11		%	35
			Acid Extractable Thallium (Tl)	2025/01/13	NC		%	35
			Acid Extractable Tin (Sn)	2025/01/13	24		%	35
			Acid Extractable Uranium (U)	2025/01/13	4.9		%	35
			Acid Extractable Vanadium (V)	2025/01/13	18		%	35
			Acid Extractable Zinc (Zn)	2025/01/13	1.7		%	35

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

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

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

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

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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

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

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Bureau Veritas Job #: C501903
Report Date: 2025/01/14

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE MINE
Sampler Initials: DP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ernlie Publicover, Scientific Specialist

Phil Deveau, Scientific Specialist (Organics)

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Suzanne Rogers, General Manager responsible for Nova Scotia Environmental laboratory operations.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Your Project #: 30235902-01
Site Location: SILICA LAKE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/27
Report #: R8476842
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C504742
Received: 2025/01/15, 16:33

Sample Matrix: Ground Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Carbonate, Bicarbonate and Hydroxide	4	N/A	2025/01/22	N/A	SM 24 4500-CO2 D
Alkalinity	2	N/A	2025/01/21	ATL SOP 00142	SM 24 2320 B
Alkalinity	2	N/A	2025/01/22	ATL SOP 00142	SM 24 2320 B
Chloride	4	N/A	2025/01/21	ATL SOP 00014	SM 24 4500-Cl- E m
Colour	4	N/A	2025/01/21	ATL SOP 00020	SM 24 2120C m
Conductance - water	2	N/A	2025/01/21	ATL SOP 00004	SM 24 2510B m
Conductance - water	2	N/A	2025/01/22	ATL SOP 00004	SM 24 2510B m
Hardness (calculated as CaCO3)	4	N/A	2025/01/23	ATL SOP 00048	Auto Calc
Metals Water Diss. MS- Lab Filtered (1)	3	N/A	2025/01/22	ATL SOP 00058	EPA 6020B R2 m
Metals Water Diss. MS- Lab Filtered (1)	1	N/A	2025/01/23	ATL SOP 00058	EPA 6020B R2 m
Ion Balance (% Difference)	4	N/A	2025/01/23	N/A	Auto Calc.
Anion and Cation Sum	4	N/A	2025/01/23	N/A	Auto Calc.
Nitrogen Ammonia - water	4	N/A	2025/01/21	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	4	N/A	2025/01/21	ATL SOP 00016	USGS I-2547-11m
Nitrogen - Nitrite	4	N/A	2025/01/21	ATL SOP 00017	SM 24 4500-NO2- B m
Nitrogen - Nitrate (as N)	4	N/A	2025/01/21	ATL SOP 00018	ASTM D3867-16
pH (2)	2	N/A	2025/01/21	ATL SOP 00003	SM 24 4500-H+ B m
pH (2)	2	N/A	2025/01/22	ATL SOP 00003	SM 24 4500-H+ B m
Phosphorus - ortho	4	N/A	2025/01/21	ATL SOP 00021	SM 24 4500-P E m
Sat. pH and Langelier Index (@ 20C)	4	N/A	2025/01/23	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	4	N/A	2025/01/23	ATL SOP 00049	Auto Calc.
Reactive Silica	4	N/A	2025/01/21	ATL SOP 00022	EPA 366.0 m
Sulphate	4	N/A	2025/01/21	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	4	N/A	2025/01/23	N/A	Auto Calc.
Organic carbon - Total (TOC) (3)	4	N/A	2025/01/21	ATL SOP 00203	SM 24 5310B m
Turbidity	4	N/A	2025/01/22	ATL SOP 00011	EPA 180.1 R2 m

Sample Matrix: Soil
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
TEH in Soil (PIRI) (5)	2	2025/01/20	2025/01/21	ATL SOP 00111	Atl. RBCA v3.1 m

Your Project #: 30235902-01
Site Location: SILICA LAKE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/27
Report #: R8476842
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C504742
Received: 2025/01/15, 16:33

Sample Matrix: Soil
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Metals Solids Acid Extr. ICPMS	8	2025/01/22	2025/01/22	ATL SOP 00058	EPA 6020B R2 m
Metals Solids Acid Extr. ICPMS	2	2025/01/22	2025/01/23	ATL SOP 00058	EPA 6020B R2 m
Moisture	2	N/A	2025/01/22	ATL SOP 00001	OMOE Handbook 1983 m
Moisture (4)	8	N/A	2025/01/21	CAM SOP-00445	Carter 2nd ed 70.2 m
PAH Compounds in Soil by GC/MS (SIM) (4)	2	2025/01/23	2025/01/23	CAM SOP-00318	EPA 8270E
PAH Compounds in Soil by GC/MS (SIM) (4)	2	2025/01/23	2025/01/24	CAM SOP-00318	EPA 8270E
PAH Compounds in Soil by GC/MS (SIM) (4)	5	2025/01/24	2025/01/24	CAM SOP-00318	EPA 8270E
PAH Compounds in Soil by GC/MS (SIM) (4)	1	2025/01/24	2025/01/25	CAM SOP-00318	EPA 8270E
ModTPH (T1) Calc. for Soil	2	N/A	2025/01/22	N/A	Atl. RBCA v3.1 m
VPH in Soil (PIRI) - Field Preserved (6)	2	N/A	2025/01/21	ATL SOP 00119	Atl. RBCA v3.1 m

Remarks:

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

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

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Sample filtered in laboratory prior to analysis for dissolved metals.

Your Project #: 30235902-01
Site Location: SILICA LAKE
Your C.O.C. #: N/A

Attention: Randy Fancey

ARCADIS Canada Inc
168 Hobsons Lake Drive
Suite 301
Halifax, NS
CANADA B3S 0G4

Report Date: 2025/01/27
Report #: R8476842
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C504742

Received: 2025/01/15, 16:33

(2) The APHA Standard Method requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(3) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.
(4) This test was performed by Bureau Veritas Mississauga, 6740 Campobello Rd , Mississauga, ON, L5N 2L8
(5) Soils are reported on a dry weight basis unless otherwise specified.
(6) No lab extraction date is given for C6-C10/BTEX and VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Marie Muise, Key Account Specialist
Email: Marie.MUISE@bureauveritas.com
Phone# (902)420-0203 Ext:253

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Suzanne Rogers, General Manager responsible for Nova Scotia Environmental laboratory operations.

Bureau Veritas Job #: C504742
Report Date: 2025/01/27

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE
Sampler Initials: RS

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		ANFV54	ANFV55		ANFV56		ANFV57		
Sampling Date		2025/01/14 14:25	2025/01/14 14:15		2025/01/14 14:20		2025/01/14 14:15		
COC Number		N/A	N/A		N/A		N/A		
	UNITS	MW1	MW2	RDL	MW3	RDL	DUP-A	RDL	QC Batch
Calculated Parameters									
Anion Sum	me/L	2.13	2.19	N/A	1.53	N/A	2.19	N/A	9860973
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	95	100	1.0	21	1.0	100	1.0	9860970
Calculated TDS	mg/L	140	140	1.0	100	1.0	140	1.0	9860979
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	9860970
Cation Sum	me/L	2.48	2.57	N/A	1.41	N/A	2.56	N/A	9860973
Hardness (CaCO3)	mg/L	100	110	1.0	47	1.0	110	1.0	9860971
Ion Balance (% Difference)	%	7.59	7.98	N/A	4.08	N/A	7.79	N/A	9860972
Langelier Index (@ 20C)	N/A	-0.343	-0.130		-1.82		-0.0430		9860976
Langelier Index (@ 4C)	N/A	-0.593	-0.381		-2.07		-0.293		9860978
Nitrate (N)	mg/L	<0.050	<0.050	0.050	<0.050	0.050	<0.050	0.050	9860975
Saturation pH (@ 20C)	N/A	7.86	7.77		9.02		7.77		9860976
Saturation pH (@ 4C)	N/A	8.11	8.02		9.27		8.02		9860978
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	95	100	2.0	21	2.0	100	2.0	9862162
Dissolved Chloride (Cl-)	mg/L	5.0	3.3	1.0	7.8	1.0	3.3	1.0	9861549
Colour	TCU	8.1	13	5.0	<5.0	5.0	14	5.0	9862006
Nitrate + Nitrite (N)	mg/L	<0.050	<0.050	0.050	<0.050	0.050	<0.050	0.050	9861545
Nitrite (N)	mg/L	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	9861550
Nitrogen (Ammonia Nitrogen)	mg/L	0.28	0.23	0.050	<0.050	0.050	0.24	0.050	9861474
Total Organic Carbon (C)	mg/L	12 (1)	8.4 (1)	5.0	9.4 (1)	5.0	7.9 (1)	5.0	9861584
Orthophosphate (P)	mg/L	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	9862007
pH	pH	7.51	7.63		7.21		7.72		9862159
Reactive Silica (SiO2)	mg/L	25	23	1.0	8.7	0.50	22	1.0	9862005
Dissolved Sulphate (SO4)	mg/L	4.4	<2.0	2.0	43	2.0	<2.0	2.0	9862003
Turbidity	NTU	>1000	810	1.0	>1000	1.0	730	1.0	9863163
Conductivity	uS/cm	240	240	1.0	170	1.0	240	1.0	9862161

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated reporting limit due to turbidity.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Bureau Veritas Job #: C504742
Report Date: 2025/01/27

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE
Sampler Initials: RS

ELEMENTS BY ICP/MS (GROUND WATER)

Bureau Veritas ID		ANFV54	ANFV55	ANFV56	ANFV57		
Sampling Date		2025/01/14 14:25	2025/01/14 14:15	2025/01/14 14:20	2025/01/14 14:15		
COC Number		N/A	N/A	N/A	N/A		
	UNITS	MW1	MW2	MW3	DUP-A	RDL	QC Batch
Metals							
Dissolved Aluminum (Al)	ug/L	<5.0	<5.0	30	<5.0	5.0	9862803
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9862803
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9862803
Dissolved Barium (Ba)	ug/L	280	230	250	220	1.0	9862803
Dissolved Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9862803
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	9862803
Dissolved Boron (B)	ug/L	<50	<50	<50	<50	50	9862803
Dissolved Cadmium (Cd)	ug/L	0.081	0.070	0.072	0.11	0.010	9862803
Dissolved Calcium (Ca)	ug/L	34000	38000	10000	38000	100	9862803
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	1.4	1.0	9862803
Dissolved Cobalt (Co)	ug/L	1.1	0.40	13	0.50	0.40	9862803
Dissolved Copper (Cu)	ug/L	1.9	3.0	0.76	4.4	0.50	9862803
Dissolved Iron (Fe)	ug/L	<50	<50	<50	57	50	9862803
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9862803
Dissolved Magnesium (Mg)	ug/L	4000	4700	5400	4700	100	9862803
Dissolved Manganese (Mn)	ug/L	1100	1100	5300	1300	2.0	9862803
Dissolved Molybdenum (Mo)	ug/L	<2.0	2.1	<2.0	2.1	2.0	9862803
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	2.9	<2.0	2.0	9862803
Dissolved Phosphorus (P)	ug/L	<100	<100	<100	<100	100	9862803
Dissolved Potassium (K)	ug/L	2500	2000	1600	2200	100	9862803
Dissolved Selenium (Se)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9862803
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9862803
Dissolved Sodium (Na)	ug/L	8600	5100	9900	5000	100	9862803
Dissolved Strontium (Sr)	ug/L	110	100	36	100	2.0	9862803
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9862803
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	9862803
Dissolved Titanium (Ti)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	9862803
Dissolved Uranium (U)	ug/L	0.16	0.20	<0.10	0.26	0.10	9862803
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	9862803
Dissolved Zinc (Zn)	ug/L	7.8	<5.0	120	<5.0	5.0	9862803

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Bureau Veritas Job #: C504742
Report Date: 2025/01/27

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE
Sampler Initials: RS

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		ANFV58			ANFV59			ANFV60		
Sampling Date		2025/01/14 13:15			2025/01/14 19:45			2025/01/14 12:55		
COC Number		N/A			N/A			N/A		
	UNITS	HA1-2	RDL	QC Batch	HA1-3	RDL	QC Batch	HA2-2	RDL	QC Batch
Inorganics										
Moisture	%				62	1.0	9862690			
Moisture	%	61	1.0	9862102				56	1.0	9862102

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		ANFV61	ANFV62	ANFV63	ANFV64	ANFV65	ANFV66	ANFV67		
Sampling Date		2025/01/14 19:40	2025/01/14 19:50	2025/01/14 19:55	2025/01/15 10:00	2025/01/15 10:15	2025/01/14 20:10	2025/01/15 10:00		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	UNITS	HA2-3	HA3-1	SS1	SS2	SS3	SS4	DUP-A	RDL	QC Batch
Inorganics										
Moisture	%	66	54	84	20	41	56	18	1.0	9862690

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		ANFV58	ANFV59	ANFV60	ANFV61		ANFV62		ANFV63		
Sampling Date		2025/01/14 13:15	2025/01/14 19:45	2025/01/14 12:55	2025/01/14 19:40		2025/01/14 19:50		2025/01/14 19:55		
COC Number		N/A	N/A	N/A	N/A		N/A		N/A		
	UNITS	HA1-2	HA1-3	HA2-2	HA2-3	RDL	HA3-1	RDL	SS1	RDL	QC Batch
Metals											
Acid Extractable Aluminum (Al)	mg/kg	11000	9300	4700	5500	10	16000	10	17000	10	9862888
Acid Extractable Antimony (Sb)	mg/kg	3.0	3.3	21	5.5	2.0	2.0	2.0	<2.0	2.0	9862888
Acid Extractable Arsenic (As)	mg/kg	3.1	2.5	6.4	4.1	2.0	13	2.0	<2.0	2.0	9862888
Acid Extractable Barium (Ba)	mg/kg	160	140	380	160	5.0	210	5.0	60	5.0	9862888
Acid Extractable Beryllium (Be)	mg/kg	0.78	0.67	0.59	0.51	0.50	0.81	0.50	1.2	0.50	9862888
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	9862888
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	<50	50	<50	50	9862888
Acid Extractable Cadmium (Cd)	mg/kg	0.38	<0.30	0.63	0.56	0.30	0.32	0.30	<0.30	0.30	9862888
Acid Extractable Chromium (Cr)	mg/kg	9.7	9.7	5.6	6.8	2.0	20	2.0	6.5	2.0	9862888
Acid Extractable Cobalt (Co)	mg/kg	3.8	3.1	3.9	2.6	1.0	9.7	1.0	1.5	1.0	9862888
Acid Extractable Copper (Cu)	mg/kg	48	42	3100	1000	2.0	8700	20	10	2.0	9862888
Acid Extractable Iron (Fe)	mg/kg	9000	7100	18000	13000	50	34000	50	2400	50	9862888
Acid Extractable Lead (Pb)	mg/kg	62	60	1200	150	0.50	66	0.50	35	0.50	9862888
Acid Extractable Lithium (Li)	mg/kg	4.9	4.6	2.3	3.1	2.0	17	2.0	2.3	2.0	9862888
Acid Extractable Manganese (Mn)	mg/kg	97	88	1200	250	2.0	370	2.0	110	2.0	9862888
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	0.11	0.45	0.10	<0.10	0.10	0.32	0.10	9862888
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	9862888
Acid Extractable Nickel (Ni)	mg/kg	7.9	7.0	5.7	6.6	2.0	14	2.0	4.0	2.0	9862888
Acid Extractable Rubidium (Rb)	mg/kg	3.3	3.4	3.8	3.3	2.0	16	2.0	<2.0	2.0	9862888
Acid Extractable Selenium (Se)	mg/kg	0.85	0.82	1.7	0.97	0.50	0.84	0.50	2.7	0.50	9862888
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	1.2	<0.50	0.50	4.1	0.50	<0.50	0.50	9862888
Acid Extractable Strontium (Sr)	mg/kg	9.2	7.6	36	18	5.0	17	5.0	13	5.0	9862888
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	0.16	0.10	<0.10	0.10	9862888
Acid Extractable Tin (Sn)	mg/kg	2.0	2.1	36	12	1.0	47	1.0	<1.0	1.0	9862888
Acid Extractable Uranium (U)	mg/kg	1.2	1.1	1.0	0.36	0.10	0.64	0.10	1.4	0.10	9862888
Acid Extractable Vanadium (V)	mg/kg	18	15	13	8.6	2.0	38	2.0	5.8	2.0	9862888
Acid Extractable Zinc (Zn)	mg/kg	130	100	160	230	5.0	630	5.0	11	5.0	9862888

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		ANFV64	ANFV65	ANFV66	ANFV67		
Sampling Date		2025/01/15 10:00	2025/01/15 10:15	2025/01/14 20:10	2025/01/15 10:00		
COC Number		N/A	N/A	N/A	N/A		
	UNITS	SS2	SS3	SS4	DUP-A	RDL	QC Batch
Metals							
Acid Extractable Aluminum (Al)	mg/kg	8400	18000	7200	9800	10	9862888
Acid Extractable Antimony (Sb)	mg/kg	3.5	<2.0	<2.0	5.7	2.0	9862888
Acid Extractable Arsenic (As)	mg/kg	4.0	8.8	<2.0	4.3	2.0	9862888
Acid Extractable Barium (Ba)	mg/kg	38	59	56	40	5.0	9862888
Acid Extractable Beryllium (Be)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	9862888
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	9862888
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	9862888
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	0.30	9862888
Acid Extractable Chromium (Cr)	mg/kg	16	33	5.1	17	2.0	9862888
Acid Extractable Cobalt (Co)	mg/kg	6.8	9.9	<1.0	8.3	1.0	9862888
Acid Extractable Copper (Cu)	mg/kg	19	42	16	24	2.0	9862888
Acid Extractable Iron (Fe)	mg/kg	20000	27000	4300	25000	50	9862888
Acid Extractable Lead (Pb)	mg/kg	38	34	30	53	0.50	9862888
Acid Extractable Lithium (Li)	mg/kg	13	18	2.4	14	2.0	9862888
Acid Extractable Manganese (Mn)	mg/kg	270	520	12	330	2.0	9862888
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	9862888
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	9862888
Acid Extractable Nickel (Ni)	mg/kg	13	17	2.9	14	2.0	9862888
Acid Extractable Rubidium (Rb)	mg/kg	5.6	8.5	<2.0	5.3	2.0	9862888
Acid Extractable Selenium (Se)	mg/kg	<0.50	0.53	0.64	<0.50	0.50	9862888
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	9862888
Acid Extractable Strontium (Sr)	mg/kg	12	17	<5.0	13	5.0	9862888
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.11	<0.10	<0.10	0.10	9862888
Acid Extractable Tin (Sn)	mg/kg	15	2.0	2.8	54	1.0	9862888
Acid Extractable Uranium (U)	mg/kg	0.46	0.57	1.2	0.54	0.10	9862888
Acid Extractable Vanadium (V)	mg/kg	29	52	12	37	2.0	9862888
Acid Extractable Zinc (Zn)	mg/kg	65	91	29	76	5.0	9862888

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		ANFV58			ANFV59			ANFV60		
Sampling Date		2025/01/14 13:15			2025/01/14 19:45			2025/01/14 12:55		
COC Number		N/A			N/A			N/A		
	UNITS	HA1-2	RDL	QC Batch	HA1-3	RDL	QC Batch	HA2-2	RDL	QC Batch
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	0.028	0.010	9864189	<0.10	0.10	9864186	0.043	0.0050	9864189
Acenaphthylene	ug/g	0.054	0.010	9864189	0.12	0.10	9864186	0.10	0.0050	9864189
Anthracene	ug/g	0.13	0.010	9864189	0.35	0.10	9864186	0.26	0.0050	9864189
Benzo(a)anthracene	ug/g	0.56	0.010	9864189	1.7	0.10	9864186	1.1	0.0050	9864189
Benzo(a)pyrene	ug/g	0.61	0.010	9864189	1.6	0.10	9864186	1.1	0.0050	9864189
Benzo(b/j)fluoranthene	ug/g	0.79	0.010	9864189	2.3	0.10	9864186	1.5	0.0050	9864189
Benzo(g,h,i)perylene	ug/g	0.32	0.010	9864189	0.84	0.10	9864186	0.72	0.0050	9864189
Benzo(k)fluoranthene	ug/g	0.32	0.010	9864189	0.84	0.10	9864186	0.58	0.0050	9864189
Chrysene	ug/g	0.63	0.010	9864189	1.9	0.10	9864186	1.1	0.0050	9864189
Dibenzo(a,h)anthracene	ug/g	0.080	0.010	9864189	0.19	0.10	9864186	0.18	0.0050	9864189
Fluoranthene	ug/g	1.7	0.010	9864189	5.5	0.10	9864186	2.5	0.0050	9864189
Fluorene	ug/g	0.052	0.010	9864189	0.13	0.10	9864186	0.068	0.0050	9864189
Indeno(1,2,3-cd)pyrene	ug/g	0.36	0.010	9864189	1.0	0.10	9864186	0.82	0.0050	9864189
1-Methylnaphthalene	ug/g	0.012	0.010	9864189	<0.10	0.10	9864186	0.013	0.0050	9864189
2-Methylnaphthalene	ug/g	0.011	0.010	9864189	<0.10	0.10	9864186	0.010	0.0050	9864189
Naphthalene	ug/g	0.033	0.010	9864189	<0.10	0.10	9864186	0.024	0.0050	9864189
Phenanthrene	ug/g	1.0	0.010	9864189	2.9	0.10	9864186	1.3	0.0050	9864189
Pyrene	ug/g	1.4	0.010	9864189	4.4	0.10	9864186	2.0	0.0050	9864189
Benzo(b)fluoranthene	ug/g	0.52	0.0060	9864189	1.4	0.060	9864186	1.0	0.0030	9864189
Perylene	ug/g	0.15	0.010	9864189	0.37	0.10	9864186	0.26	0.0050	9864189
Benzo(j)fluoranthene	ug/g	0.28	0.0060	9864189	0.86	0.060	9864186	0.48	0.0030	9864189
Surrogate Recovery (%)										
D10-Anthracene	%	95		9864189	64		9864186	92		9864189
D14-Terphenyl (FS)	%	85		9864189	45 (1)		9864186	86		9864189
D8-Acenaphthylene	%	90		9864189	61		9864186	88		9864189

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		ANFV61		ANFV62			ANFV63		
Sampling Date		2025/01/14 19:40		2025/01/14 19:50			2025/01/14 19:55		
COC Number		N/A		N/A			N/A		
	UNITS	HA2-3	QC Batch	HA3-1	RDL	QC Batch	SS1	RDL	QC Batch
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.010	9864186	<0.010	0.010	9863861	<0.015	0.015	9864186
Acenaphthylene	ug/g	0.019	9864186	0.029	0.010	9863861	<0.015	0.015	9864186
Anthracene	ug/g	0.057	9864186	0.046	0.010	9863861	<0.015	0.015	9864186
Benzo(a)anthracene	ug/g	0.29	9864186	0.16	0.010	9863861	0.017	0.015	9864186
Benzo(a)pyrene	ug/g	0.32	9864186	0.16	0.010	9863861	<0.015	0.015	9864186
Benzo(b/j)fluoranthene	ug/g	0.51	9864186	0.20	0.010	9863861	0.040	0.015	9864186
Benzo(g,h,i)perylene	ug/g	0.61	9864186	0.084	0.010	9863861	<0.015	0.015	9864186
Benzo(k)fluoranthene	ug/g	0.17	9864186	0.071	0.010	9863861	<0.015	0.015	9864186
Chrysene	ug/g	0.33	9864186	0.16	0.010	9863861	0.027	0.015	9864186
Dibenzo(a,h)anthracene	ug/g	0.067	9864186	0.022	0.010	9863861	<0.015	0.015	9864186
Fluoranthene	ug/g	0.69	9864186	0.44	0.010	9863861	0.054	0.015	9864186
Fluorene	ug/g	0.011	9864186	0.027	0.010	9863861	<0.015	0.015	9864186
Indeno(1,2,3-cd)pyrene	ug/g	0.49	9864186	0.098	0.010	9863861	0.019	0.015	9864186
1-Methylnaphthalene	ug/g	<0.010	9864186	<0.010	0.010	9863861	<0.015	0.015	9864186
2-Methylnaphthalene	ug/g	<0.010	9864186	<0.010	0.010	9863861	<0.015	0.015	9864186
Naphthalene	ug/g	<0.010	9864186	0.015	0.010	9863861	<0.015	0.015	9864186
Phenanthrene	ug/g	0.24	9864186	0.32	0.010	9863861	0.024	0.015	9864186
Pyrene	ug/g	0.61	9864186	0.34	0.010	9863861	0.045	0.015	9864186
Benzo(b)fluoranthene	ug/g	0.33	9864186	0.12	0.0060	9863861	0.029	0.0090	9864186
Perylene	ug/g	0.096	9864186	0.035	0.010	9863861	0.14	0.015	9864186
Benzo(j)fluoranthene	ug/g	0.18	9864186	0.077	0.0060	9863861	0.012	0.0090	9864186
Surrogate Recovery (%)									
D10-Anthracene	%	63	9864186	83		9863861	77		9864186
D14-Terphenyl (FS)	%	66	9864186	85		9863861	86		9864186
D8-Acenaphthylene	%	69	9864186	78		9863861	80		9864186

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		ANFV64	ANFV65		ANFV66			ANFV67		
Sampling Date		2025/01/15 10:00	2025/01/15 10:15		2025/01/14 20:10			2025/01/15 10:00		
COC Number		N/A	N/A		N/A			N/A		
	UNITS	SS2	SS3	QC Batch	SS4	RDL	QC Batch	DUP-A	RDL	QC Batch
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	0.0095	0.027	9863861	0.018	0.0050	9864186	0.11	0.050	9863861
Acenaphthylene	ug/g	0.032	0.060	9863861	0.051	0.0050	9864186	0.38	0.050	9863861
Anthracene	ug/g	0.056	0.10	9863861	0.11	0.0050	9864186	0.81	0.050	9863861
Benzo(a)anthracene	ug/g	0.18	0.42	9863861	0.49	0.0050	9864186	2.4	0.050	9863861
Benzo(a)pyrene	ug/g	0.20	0.49	9863861	0.53	0.0050	9864186	2.6	0.050	9863861
Benzo(b/j)fluoranthene	ug/g	0.25	0.62	9863861	0.68	0.0050	9864186	3.2	0.050	9863861
Benzo(g,h,i)perylene	ug/g	0.12	0.32	9863861	0.27	0.0050	9864186	1.5	0.050	9863861
Benzo(k)fluoranthene	ug/g	0.089	0.21	9863861	0.26	0.0050	9864186	1.1	0.050	9863861
Chrysene	ug/g	0.19	0.44	9863861	0.58	0.0050	9864186	2.5	0.050	9863861
Dibenzo(a,h)anthracene	ug/g	0.026	0.070	9863861	0.072	0.0050	9864186	0.33	0.050	9863861
Fluoranthene	ug/g	0.54	1.1	9863861	1.5	0.0050	9864186	7.0	0.050	9863861
Fluorene	ug/g	0.016	0.031	9863861	0.037	0.0050	9864186	0.23	0.050	9863861
Indeno(1,2,3-cd)pyrene	ug/g	0.14	0.34	9863861	0.34	0.0050	9864186	1.7	0.050	9863861
1-Methylnaphthalene	ug/g	<0.0050	0.0054	9863861	0.0094	0.0050	9864186	<0.050	0.050	9863861
2-Methylnaphthalene	ug/g	<0.0050	0.0070	9863861	0.0096	0.0050	9864186	<0.050	0.050	9863861
Naphthalene	ug/g	0.0061	0.0080	9863861	0.019	0.0050	9864186	0.059	0.050	9863861
Phenanthrene	ug/g	0.33	0.59	9863861	0.78	0.0050	9864186	4.4	0.050	9863861
Pyrene	ug/g	0.44	0.97	9863861	1.2	0.0050	9864186	5.9	0.050	9863861
Benzo(b)fluoranthene	ug/g	0.16	0.39	9863861	0.43	0.0030	9864186	2.0	0.030	9863861
Perylene	ug/g	0.047	0.12	9863861	0.12	0.0050	9864186	0.64	0.050	9863861
Benzo(j)fluoranthene	ug/g	0.097	0.23	9863861	0.25	0.0030	9864186	1.2	0.030	9863861
Surrogate Recovery (%)										
D10-Anthracene	%	74	90	9863861	95		9864186	86		9863861
D14-Terphenyl (FS)	%	77	95	9863861	103		9864186	92		9863861
D8-Acenaphthylene	%	66	86	9863861	93		9864186	85		9863861

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

ATLANTIC RBCA HYDROCARBONS (SOIL)

Bureau Veritas ID		ANFV58	ANFV60		
Sampling Date		2025/01/14 13:15	2025/01/14 12:55		
COC Number		N/A	N/A		
	UNITS	HA1-2	HA2-2	RDL	QC Batch
Petroleum Hydrocarbons					
Benzene	mg/kg	<0.0050	<0.0050	0.0050	9861772
Toluene	mg/kg	<0.050	<0.050	0.050	9861772
Ethylbenzene	mg/kg	<0.010	<0.010	0.010	9861772
Total Xylenes	mg/kg	<0.050	<0.050	0.050	9861772
C6 - C10 (less BTEX)	mg/kg	<2.5	<2.5	2.5	9861772
>C10-C16 Hydrocarbons	mg/kg	<10	<10	10	9861758
>C16-C21 Hydrocarbons	mg/kg	<10	<10	10	9861758
>C21-<C32 Hydrocarbons	mg/kg	71	110	15	9861758
Modified TPH (Tier1)	mg/kg	71	110	15	9860337
Reached Baseline at C32	mg/kg	Yes	Yes	N/A	9861758
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	N/A	9861758
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	88	88		9861758
n-Dotriacontane - Extractable	%	111	119		9861758
Isobutylbenzene - Volatile	%	112	121		9861772

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Lube oil fraction.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.3°C

TEH Analysis: Silica gel clean-up performed prior to analysis as per client request.

Sample ANFV54 [MW1] : Poor RCAp Ion Balance due to sample matrix. Possibly due to fine particulate matter.

Sample ANFV55 [MW2] : Poor RCAp Ion Balance due to sample matrix. Possibly due to fine particulate matter.

Sample ANFV57 [DUP-A] : Poor RCAp Ion Balance due to sample matrix. Possibly due to fine particulate matter.

Sample ANFV58 [HA1-2] : PAH ANALYSIS: Detection limits were adjusted for high moisture content.

Sample ANFV59 [HA1-3] : PAH ANALYSIS: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
PAH ANALYSIS: Detection limits were adjusted for high moisture content.

Sample ANFV61 [HA2-3] : PAH ANALYSIS: Detection limits were adjusted for high moisture content.

Sample ANFV62 [HA3-1] : PAH ANALYSIS: Detection limits were adjusted for high moisture content.

Sample ANFV63 [SS1] : PAH ANALYSIS: Detection limits were adjusted for high moisture content.

Sample ANFV67 [DUP-A] : PAH ANALYSIS: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9861474	MCN	Matrix Spike [ANFV54-04]	Nitrogen (Ammonia Nitrogen)	2025/01/20		65 (1)	%	80 - 120
9861474	MCN	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2025/01/20		101	%	80 - 120
9861474	MCN	Method Blank	Nitrogen (Ammonia Nitrogen)	2025/01/20	<0.050		mg/L	
9861474	MCN	RPD [ANFV54-04]	Nitrogen (Ammonia Nitrogen)	2025/01/21	1.6		%	20
9861545	EMT	Matrix Spike	Nitrate + Nitrite (N)	2025/01/21		NC	%	80 - 120
9861545	EMT	Spiked Blank	Nitrate + Nitrite (N)	2025/01/21		102	%	80 - 120
9861545	EMT	Method Blank	Nitrate + Nitrite (N)	2025/01/21	<0.050		mg/L	
9861545	EMT	RPD	Nitrate + Nitrite (N)	2025/01/21	1.8		%	20
9861549	EMT	Matrix Spike	Dissolved Chloride (Cl-)	2025/01/21		NC	%	80 - 120
9861549	EMT	Spiked Blank	Dissolved Chloride (Cl-)	2025/01/21		95	%	80 - 120
9861549	EMT	Method Blank	Dissolved Chloride (Cl-)	2025/01/21	<1.0		mg/L	
9861549	EMT	RPD	Dissolved Chloride (Cl-)	2025/01/21	0.86		%	20
9861550	EMT	Matrix Spike	Nitrite (N)	2025/01/21		101	%	80 - 120
9861550	EMT	Spiked Blank	Nitrite (N)	2025/01/21		103	%	80 - 120
9861550	EMT	Method Blank	Nitrite (N)	2025/01/21	<0.010		mg/L	
9861550	EMT	RPD	Nitrite (N)	2025/01/21	NC		%	20
9861584	ACK	Matrix Spike	Total Organic Carbon (C)	2025/01/20		104	%	85 - 115
9861584	ACK	Spiked Blank	Total Organic Carbon (C)	2025/01/20		103	%	80 - 120
9861584	ACK	Method Blank	Total Organic Carbon (C)	2025/01/20	<0.50		mg/L	
9861584	ACK	RPD	Total Organic Carbon (C)	2025/01/20	1.9		%	15
9861758	MGN	Matrix Spike	Isobutylbenzene - Extractable	2025/01/21		92	%	60 - 130
			n-Dotriacontane - Extractable	2025/01/21		94	%	60 - 130
			>C10-C16 Hydrocarbons	2025/01/21		83	%	30 - 130
			>C16-C21 Hydrocarbons	2025/01/21		94	%	30 - 130
			>C21-<C32 Hydrocarbons	2025/01/21		NC	%	30 - 130
9861758	MGN	Spiked Blank	Isobutylbenzene - Extractable	2025/01/21		99	%	60 - 130
			n-Dotriacontane - Extractable	2025/01/21		105	%	60 - 130
			>C10-C16 Hydrocarbons	2025/01/21		104	%	60 - 130
			>C16-C21 Hydrocarbons	2025/01/21		112	%	60 - 130
			>C21-<C32 Hydrocarbons	2025/01/21		122	%	60 - 130
9861758	MGN	Method Blank	Isobutylbenzene - Extractable	2025/01/21		98	%	60 - 130
			n-Dotriacontane - Extractable	2025/01/21		96	%	60 - 130
			>C10-C16 Hydrocarbons	2025/01/21	<10		mg/kg	
			>C16-C21 Hydrocarbons	2025/01/21	<10		mg/kg	
			>C21-<C32 Hydrocarbons	2025/01/21	<15		mg/kg	
9861758	MGN	RPD	>C10-C16 Hydrocarbons	2025/01/21	32		%	50
			>C16-C21 Hydrocarbons	2025/01/21	18		%	50
			>C21-<C32 Hydrocarbons	2025/01/21	15		%	50
9861772	SHL	Matrix Spike	Isobutylbenzene - Volatile	2025/01/21		110	%	60 - 130
			Benzene	2025/01/21		96	%	60 - 130
			Toluene	2025/01/21		95	%	60 - 130
			Ethylbenzene	2025/01/21		101	%	60 - 130
			Total Xylenes	2025/01/21		99	%	60 - 130
9861772	SHL	Spiked Blank	Isobutylbenzene - Volatile	2025/01/21		98	%	60 - 130
			Benzene	2025/01/21		98	%	60 - 140
			Toluene	2025/01/21		101	%	60 - 140
			Ethylbenzene	2025/01/21		100	%	60 - 140
			Total Xylenes	2025/01/21		101	%	60 - 140
9861772	SHL	Method Blank	Isobutylbenzene - Volatile	2025/01/21		98	%	60 - 130
			Benzene	2025/01/21	<0.0050		mg/kg	
			Toluene	2025/01/21	<0.050		mg/kg	
			Ethylbenzene	2025/01/21	<0.010		mg/kg	
			Total Xylenes	2025/01/21	<0.050		mg/kg	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			C6 - C10 (less BTEX)	2025/01/21	<2.5		mg/kg	
9861772	SHL	RPD	Benzene	2025/01/21	NC		%	50
			Toluene	2025/01/21	NC		%	50
			Ethylbenzene	2025/01/21	NC		%	50
			Total Xylenes	2025/01/21	NC		%	50
			C6 - C10 (less BTEX)	2025/01/21	NC		%	50
9862003	EMT	Matrix Spike	Dissolved Sulphate (SO4)	2025/01/21		99	%	80 - 120
9862003	EMT	Spiked Blank	Dissolved Sulphate (SO4)	2025/01/21		100	%	80 - 120
9862003	EMT	Method Blank	Dissolved Sulphate (SO4)	2025/01/21	<2.0		mg/L	
9862003	EMT	RPD	Dissolved Sulphate (SO4)	2025/01/21	9.2		%	20
9862005	EMT	Matrix Spike	Reactive Silica (SiO2)	2025/01/21		NC	%	80 - 120
9862005	EMT	Spiked Blank	Reactive Silica (SiO2)	2025/01/21		94	%	80 - 120
9862005	EMT	Method Blank	Reactive Silica (SiO2)	2025/01/21	<0.50		mg/L	
9862005	EMT	RPD	Reactive Silica (SiO2)	2025/01/21	4.8		%	20
9862006	EMT	Spiked Blank	Colour	2025/01/21		84	%	80 - 120
9862006	EMT	Method Blank	Colour	2025/01/21	<5.0		TCU	
9862006	EMT	RPD	Colour	2025/01/21	NC		%	20
9862007	EMT	Matrix Spike	Orthophosphate (P)	2025/01/21		91	%	80 - 120
9862007	EMT	Spiked Blank	Orthophosphate (P)	2025/01/21		98	%	80 - 120
9862007	EMT	Method Blank	Orthophosphate (P)	2025/01/21	<0.010		mg/L	
9862007	EMT	RPD	Orthophosphate (P)	2025/01/21	0.68		%	20
9862102	GEP	RPD	Moisture	2025/01/22	3.8		%	25
9862159	M2C	Spiked Blank	pH	2025/01/21		100	%	97 - 103
9862159	M2C	RPD	pH	2025/01/21	1.3		%	N/A
9862161	M2C	Spiked Blank	Conductivity	2025/01/21		95	%	80 - 120
9862161	M2C	Method Blank	Conductivity	2025/01/21	<1.0		uS/cm	
9862161	M2C	RPD	Conductivity	2025/01/21	1.8		%	10
9862162	M2C	Spiked Blank	Total Alkalinity (Total as CaCO3)	2025/01/21		97	%	80 - 120
9862162	M2C	Method Blank	Total Alkalinity (Total as CaCO3)	2025/01/21	<2.0		mg/L	
9862162	M2C	RPD	Total Alkalinity (Total as CaCO3)	2025/01/21	3.4		%	20
9862690	R1P	RPD	Moisture	2025/01/21	3.2		%	20
9862803	MOA	Matrix Spike	Dissolved Aluminum (Al)	2025/01/23		100	%	80 - 120
			Dissolved Antimony (Sb)	2025/01/23		101	%	80 - 120
			Dissolved Arsenic (As)	2025/01/23		98	%	80 - 120
			Dissolved Barium (Ba)	2025/01/23		96	%	80 - 120
			Dissolved Beryllium (Be)	2025/01/23		98	%	80 - 120
			Dissolved Bismuth (Bi)	2025/01/23		103	%	80 - 120
			Dissolved Boron (B)	2025/01/23		98	%	80 - 120
			Dissolved Cadmium (Cd)	2025/01/23		101	%	80 - 120
			Dissolved Calcium (Ca)	2025/01/23		92	%	80 - 120
			Dissolved Chromium (Cr)	2025/01/23		96	%	80 - 120
			Dissolved Cobalt (Co)	2025/01/23		93	%	80 - 120
			Dissolved Copper (Cu)	2025/01/23		96	%	80 - 120
			Dissolved Iron (Fe)	2025/01/23		100	%	80 - 120
			Dissolved Lead (Pb)	2025/01/23		96	%	80 - 120
			Dissolved Magnesium (Mg)	2025/01/23		101	%	80 - 120
			Dissolved Manganese (Mn)	2025/01/23		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2025/01/23		105	%	80 - 120
			Dissolved Nickel (Ni)	2025/01/23		97	%	80 - 120
			Dissolved Phosphorus (P)	2025/01/23		104	%	80 - 120
			Dissolved Potassium (K)	2025/01/23		94	%	80 - 120
			Dissolved Selenium (Se)	2025/01/23		96	%	80 - 120
			Dissolved Silver (Ag)	2025/01/23		94	%	80 - 120

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2025/01/23		96	%	80 - 120
			Dissolved Strontium (Sr)	2025/01/23		98	%	80 - 120
			Dissolved Thallium (Tl)	2025/01/23		101	%	80 - 120
			Dissolved Tin (Sn)	2025/01/23		97	%	80 - 120
			Dissolved Titanium (Ti)	2025/01/23		100	%	80 - 120
			Dissolved Uranium (U)	2025/01/23		103	%	80 - 120
			Dissolved Vanadium (V)	2025/01/23		98	%	80 - 120
			Dissolved Zinc (Zn)	2025/01/23		96	%	80 - 120
9862803	MOA	Spiked Blank	Dissolved Aluminum (Al)	2025/01/23		106	%	80 - 120
			Dissolved Antimony (Sb)	2025/01/23		100	%	80 - 120
			Dissolved Arsenic (As)	2025/01/23		95	%	80 - 120
			Dissolved Barium (Ba)	2025/01/23		98	%	80 - 120
			Dissolved Beryllium (Be)	2025/01/23		96	%	80 - 120
			Dissolved Bismuth (Bi)	2025/01/23		99	%	80 - 120
			Dissolved Boron (B)	2025/01/23		96	%	80 - 120
			Dissolved Cadmium (Cd)	2025/01/23		93	%	80 - 120
			Dissolved Calcium (Ca)	2025/01/23		98	%	80 - 120
			Dissolved Chromium (Cr)	2025/01/23		96	%	80 - 120
			Dissolved Cobalt (Co)	2025/01/23		92	%	80 - 120
			Dissolved Copper (Cu)	2025/01/23		93	%	80 - 120
			Dissolved Iron (Fe)	2025/01/23		104	%	80 - 120
			Dissolved Lead (Pb)	2025/01/23		94	%	80 - 120
			Dissolved Magnesium (Mg)	2025/01/23		97	%	80 - 120
			Dissolved Manganese (Mn)	2025/01/23		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2025/01/23		104	%	80 - 120
			Dissolved Nickel (Ni)	2025/01/23		97	%	80 - 120
			Dissolved Phosphorus (P)	2025/01/23		102	%	80 - 120
			Dissolved Potassium (K)	2025/01/23		98	%	80 - 120
			Dissolved Selenium (Se)	2025/01/23		96	%	80 - 120
			Dissolved Silver (Ag)	2025/01/23		95	%	80 - 120
			Dissolved Sodium (Na)	2025/01/23		98	%	80 - 120
			Dissolved Strontium (Sr)	2025/01/23		97	%	80 - 120
			Dissolved Thallium (Tl)	2025/01/23		99	%	80 - 120
			Dissolved Tin (Sn)	2025/01/23		97	%	80 - 120
			Dissolved Titanium (Ti)	2025/01/23		98	%	80 - 120
			Dissolved Uranium (U)	2025/01/23		101	%	80 - 120
			Dissolved Vanadium (V)	2025/01/23		98	%	80 - 120
			Dissolved Zinc (Zn)	2025/01/23		99	%	80 - 120
9862803	MOA	Method Blank	Dissolved Aluminum (Al)	2025/01/22	<5.0		ug/L	
			Dissolved Antimony (Sb)	2025/01/22	<1.0		ug/L	
			Dissolved Arsenic (As)	2025/01/22	<1.0		ug/L	
			Dissolved Barium (Ba)	2025/01/22	<1.0		ug/L	
			Dissolved Beryllium (Be)	2025/01/22	<0.10		ug/L	
			Dissolved Bismuth (Bi)	2025/01/22	<2.0		ug/L	
			Dissolved Boron (B)	2025/01/22	<50		ug/L	
			Dissolved Cadmium (Cd)	2025/01/22	<0.010		ug/L	
			Dissolved Calcium (Ca)	2025/01/22	<100		ug/L	
			Dissolved Chromium (Cr)	2025/01/22	<1.0		ug/L	
			Dissolved Cobalt (Co)	2025/01/22	<0.40		ug/L	
			Dissolved Copper (Cu)	2025/01/22	<0.50		ug/L	
			Dissolved Iron (Fe)	2025/01/22	<50		ug/L	
			Dissolved Lead (Pb)	2025/01/22	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2025/01/22	<100		ug/L	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Manganese (Mn)	2025/01/22	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2025/01/22	<2.0		ug/L	
			Dissolved Nickel (Ni)	2025/01/22	<2.0		ug/L	
			Dissolved Phosphorus (P)	2025/01/22	<100		ug/L	
			Dissolved Potassium (K)	2025/01/22	<100		ug/L	
			Dissolved Selenium (Se)	2025/01/22	<0.50		ug/L	
			Dissolved Silver (Ag)	2025/01/22	<0.10		ug/L	
			Dissolved Sodium (Na)	2025/01/22	<100		ug/L	
			Dissolved Strontium (Sr)	2025/01/22	<2.0		ug/L	
			Dissolved Thallium (Tl)	2025/01/22	<0.10		ug/L	
			Dissolved Tin (Sn)	2025/01/22	<2.0		ug/L	
			Dissolved Titanium (Ti)	2025/01/22	<2.0		ug/L	
			Dissolved Uranium (U)	2025/01/22	<0.10		ug/L	
			Dissolved Vanadium (V)	2025/01/22	<2.0		ug/L	
			Dissolved Zinc (Zn)	2025/01/22	<5.0		ug/L	
9862803	MOA	RPD	Dissolved Aluminum (Al)	2025/01/23	15		%	20
			Dissolved Antimony (Sb)	2025/01/23	NC		%	20
			Dissolved Arsenic (As)	2025/01/23	NC		%	20
			Dissolved Barium (Ba)	2025/01/23	2.7		%	20
			Dissolved Beryllium (Be)	2025/01/23	NC		%	20
			Dissolved Bismuth (Bi)	2025/01/23	NC		%	20
			Dissolved Boron (B)	2025/01/23	NC		%	20
			Dissolved Cadmium (Cd)	2025/01/23	17		%	20
			Dissolved Calcium (Ca)	2025/01/23	1.4		%	20
			Dissolved Chromium (Cr)	2025/01/23	NC		%	20
			Dissolved Cobalt (Co)	2025/01/23	NC		%	20
			Dissolved Copper (Cu)	2025/01/23	NC		%	20
			Dissolved Iron (Fe)	2025/01/23	NC		%	20
			Dissolved Lead (Pb)	2025/01/23	NC		%	20
			Dissolved Magnesium (Mg)	2025/01/23	1.9		%	20
			Dissolved Manganese (Mn)	2025/01/23	0.70		%	20
			Dissolved Molybdenum (Mo)	2025/01/23	NC		%	20
			Dissolved Nickel (Ni)	2025/01/23	NC		%	20
			Dissolved Phosphorus (P)	2025/01/23	1.4		%	20
			Dissolved Potassium (K)	2025/01/23	NC		%	20
			Dissolved Selenium (Se)	2025/01/23	NC		%	20
			Dissolved Silver (Ag)	2025/01/23	NC		%	20
			Dissolved Sodium (Na)	2025/01/23	0.66		%	20
			Dissolved Strontium (Sr)	2025/01/23	8.4		%	20
			Dissolved Thallium (Tl)	2025/01/23	NC		%	20
			Dissolved Tin (Sn)	2025/01/23	NC		%	20
			Dissolved Titanium (Ti)	2025/01/23	NC		%	20
			Dissolved Uranium (U)	2025/01/23	NC		%	20
			Dissolved Vanadium (V)	2025/01/23	NC		%	20
			Dissolved Zinc (Zn)	2025/01/23	2.8		%	20
9862888	MTZ	Matrix Spike [ANFV67-01]	Acid Extractable Antimony (Sb)	2025/01/22		NC	%	75 - 125
			Acid Extractable Arsenic (As)	2025/01/22		93	%	75 - 125
			Acid Extractable Barium (Ba)	2025/01/22		97	%	75 - 125
			Acid Extractable Beryllium (Be)	2025/01/22		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2025/01/22		99	%	75 - 125
			Acid Extractable Boron (B)	2025/01/22		94	%	75 - 125
			Acid Extractable Cadmium (Cd)	2025/01/22		96	%	75 - 125
			Acid Extractable Chromium (Cr)	2025/01/22		102	%	75 - 125

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Cobalt (Co)	2025/01/22		92	%	75 - 125
			Acid Extractable Copper (Cu)	2025/01/22		91	%	75 - 125
			Acid Extractable Lead (Pb)	2025/01/22		NC	%	75 - 125
			Acid Extractable Lithium (Li)	2025/01/22		103	%	75 - 125
			Acid Extractable Manganese (Mn)	2025/01/22		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2025/01/22		95	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2025/01/22		104	%	75 - 125
			Acid Extractable Nickel (Ni)	2025/01/22		97	%	75 - 125
			Acid Extractable Rubidium (Rb)	2025/01/22		99	%	75 - 125
			Acid Extractable Selenium (Se)	2025/01/22		97	%	75 - 125
			Acid Extractable Silver (Ag)	2025/01/22		98	%	75 - 125
			Acid Extractable Strontium (Sr)	2025/01/22		102	%	75 - 125
			Acid Extractable Thallium (Tl)	2025/01/22		100	%	75 - 125
			Acid Extractable Tin (Sn)	2025/01/22		NC	%	75 - 125
			Acid Extractable Uranium (U)	2025/01/22		97	%	75 - 125
			Acid Extractable Vanadium (V)	2025/01/22		86	%	75 - 125
			Acid Extractable Zinc (Zn)	2025/01/22		NC	%	75 - 125
9862888	MTZ	Spiked Blank	Acid Extractable Antimony (Sb)	2025/01/22		101	%	75 - 125
			Acid Extractable Arsenic (As)	2025/01/22		98	%	75 - 125
			Acid Extractable Barium (Ba)	2025/01/22		101	%	75 - 125
			Acid Extractable Beryllium (Be)	2025/01/22		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2025/01/22		99	%	75 - 125
			Acid Extractable Boron (B)	2025/01/22		100	%	75 - 125
			Acid Extractable Cadmium (Cd)	2025/01/22		94	%	75 - 125
			Acid Extractable Chromium (Cr)	2025/01/22		95	%	75 - 125
			Acid Extractable Cobalt (Co)	2025/01/22		92	%	75 - 125
			Acid Extractable Copper (Cu)	2025/01/22		90	%	75 - 125
			Acid Extractable Lead (Pb)	2025/01/22		95	%	75 - 125
			Acid Extractable Lithium (Li)	2025/01/22		100	%	75 - 125
			Acid Extractable Manganese (Mn)	2025/01/22		96	%	75 - 125
			Acid Extractable Mercury (Hg)	2025/01/22		105	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2025/01/22		106	%	75 - 125
			Acid Extractable Nickel (Ni)	2025/01/22		96	%	75 - 125
			Acid Extractable Rubidium (Rb)	2025/01/22		100	%	75 - 125
			Acid Extractable Selenium (Se)	2025/01/22		99	%	75 - 125
			Acid Extractable Silver (Ag)	2025/01/22		94	%	75 - 125
			Acid Extractable Strontium (Sr)	2025/01/22		96	%	75 - 125
			Acid Extractable Thallium (Tl)	2025/01/22		99	%	75 - 125
			Acid Extractable Tin (Sn)	2025/01/22		100	%	75 - 125
			Acid Extractable Uranium (U)	2025/01/22		97	%	75 - 125
			Acid Extractable Vanadium (V)	2025/01/22		99	%	75 - 125
			Acid Extractable Zinc (Zn)	2025/01/22		95	%	75 - 125
9862888	MTZ	Method Blank	Acid Extractable Aluminum (Al)	2025/01/22	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2025/01/22	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2025/01/22	<0.50		mg/kg	
			Acid Extractable Bismuth (Bi)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Boron (B)	2025/01/22	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2025/01/22	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2025/01/22	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2025/01/22	<2.0		mg/kg	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Iron (Fe)	2025/01/22	<50		mg/kg	
			Acid Extractable Lead (Pb)	2025/01/22	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2025/01/22	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2025/01/22	<0.50		mg/kg	
			Acid Extractable Silver (Ag)	2025/01/22	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2025/01/22	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2025/01/22	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2025/01/22	<1.0		mg/kg	
			Acid Extractable Uranium (U)	2025/01/22	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2025/01/22	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2025/01/22	<5.0		mg/kg	
9862888	MTZ	RPD [ANFV67-01]	Acid Extractable Aluminum (Al)	2025/01/22	7.8		%	35
			Acid Extractable Antimony (Sb)	2025/01/22	28		%	35
			Acid Extractable Arsenic (As)	2025/01/22	9.3		%	35
			Acid Extractable Barium (Ba)	2025/01/22	0.65		%	35
			Acid Extractable Beryllium (Be)	2025/01/22	NC		%	35
			Acid Extractable Bismuth (Bi)	2025/01/22	NC		%	35
			Acid Extractable Boron (B)	2025/01/22	NC		%	35
			Acid Extractable Cadmium (Cd)	2025/01/22	NC		%	35
			Acid Extractable Chromium (Cr)	2025/01/22	9.0		%	35
			Acid Extractable Cobalt (Co)	2025/01/22	12		%	35
			Acid Extractable Copper (Cu)	2025/01/22	8.6		%	35
			Acid Extractable Iron (Fe)	2025/01/22	10		%	35
			Acid Extractable Lead (Pb)	2025/01/22	29		%	35
			Acid Extractable Lithium (Li)	2025/01/22	4.6		%	35
			Acid Extractable Manganese (Mn)	2025/01/22	15		%	35
			Acid Extractable Mercury (Hg)	2025/01/22	NC		%	35
			Acid Extractable Molybdenum (Mo)	2025/01/22	NC		%	35
			Acid Extractable Nickel (Ni)	2025/01/22	5.6		%	35
			Acid Extractable Rubidium (Rb)	2025/01/22	8.4		%	35
			Acid Extractable Selenium (Se)	2025/01/22	NC		%	35
			Acid Extractable Silver (Ag)	2025/01/22	NC		%	35
			Acid Extractable Strontium (Sr)	2025/01/22	7.3		%	35
			Acid Extractable Thallium (Tl)	2025/01/22	NC		%	35
			Acid Extractable Tin (Sn)	2025/01/22	163 (2)		%	35
			Acid Extractable Uranium (U)	2025/01/22	8.1		%	35
			Acid Extractable Vanadium (V)	2025/01/22	21		%	35
			Acid Extractable Zinc (Zn)	2025/01/22	2.2		%	35
9863163	M2C	QC Standard	Turbidity	2025/01/22		108	%	80 - 120
9863163	M2C	Spiked Blank	Turbidity	2025/01/22		104	%	80 - 120
9863163	M2C	Method Blank	Turbidity	2025/01/22	<0.10		NTU	
9863163	M2C	RPD	Turbidity	2025/01/22	1.9		%	20
9863861	JYO	Matrix Spike	D10-Anthracene	2025/01/23		87	%	50 - 130
			D14-Terphenyl (FS)	2025/01/23		93	%	50 - 130
			D8-Acenaphthylene	2025/01/23		79	%	50 - 130
			Acenaphthene	2025/01/23		86	%	50 - 130
			Acenaphthylene	2025/01/23		81	%	50 - 130
			Anthracene	2025/01/23		93	%	50 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(a)anthracene	2025/01/23		90	%	50 - 130
			Benzo(a)pyrene	2025/01/23		86	%	50 - 130
			Benzo(b/j)fluoranthene	2025/01/23		90	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/23		94	%	50 - 130
			Benzo(k)fluoranthene	2025/01/23		88	%	50 - 130
			Chrysene	2025/01/23		85	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/23		83	%	50 - 130
			Fluoranthene	2025/01/23		95	%	50 - 130
			Fluorene	2025/01/23		88	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/23		95	%	50 - 130
			1-Methylnaphthalene	2025/01/23		86	%	50 - 130
			2-Methylnaphthalene	2025/01/23		87	%	50 - 130
			Naphthalene	2025/01/23		81	%	50 - 130
			Phenanthrene	2025/01/23		88	%	50 - 130
			Pyrene	2025/01/23		96	%	50 - 130
			Benzo(b)fluoranthene	2025/01/23		92	%	50 - 130
			Perylene	2025/01/23		90	%	50 - 130
			Benzo(j)fluoranthene	2025/01/23		89	%	50 - 130
9863861	JYO	Spiked Blank	D10-Anthracene	2025/01/23		89	%	50 - 130
			D14-Terphenyl (FS)	2025/01/23		95	%	50 - 130
			D8-Acenaphthylene	2025/01/23		83	%	50 - 130
			Acenaphthene	2025/01/23		88	%	50 - 130
			Acenaphthylene	2025/01/23		82	%	50 - 130
			Anthracene	2025/01/23		95	%	50 - 130
			Benzo(a)anthracene	2025/01/23		91	%	50 - 130
			Benzo(a)pyrene	2025/01/23		89	%	50 - 130
			Benzo(b/j)fluoranthene	2025/01/23		93	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/23		96	%	50 - 130
			Benzo(k)fluoranthene	2025/01/23		92	%	50 - 130
			Chrysene	2025/01/23		87	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/23		84	%	50 - 130
			Fluoranthene	2025/01/23		97	%	50 - 130
			Fluorene	2025/01/23		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/23		97	%	50 - 130
			1-Methylnaphthalene	2025/01/23		90	%	50 - 130
			2-Methylnaphthalene	2025/01/23		91	%	50 - 130
			Naphthalene	2025/01/23		85	%	50 - 130
			Phenanthrene	2025/01/23		90	%	50 - 130
			Pyrene	2025/01/23		98	%	50 - 130
			Benzo(b)fluoranthene	2025/01/23		95	%	50 - 130
			Perylene	2025/01/23		93	%	50 - 130
			Benzo(j)fluoranthene	2025/01/23		92	%	50 - 130
9863861	JYO	Method Blank	D10-Anthracene	2025/01/23		92	%	50 - 130
			D14-Terphenyl (FS)	2025/01/23		94	%	50 - 130
			D8-Acenaphthylene	2025/01/23		84	%	50 - 130
			Acenaphthene	2025/01/23	<0.0050		ug/g	
			Acenaphthylene	2025/01/23	<0.0050		ug/g	
			Anthracene	2025/01/23	<0.0050		ug/g	
			Benzo(a)anthracene	2025/01/23	<0.0050		ug/g	
			Benzo(a)pyrene	2025/01/23	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2025/01/23	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2025/01/23	<0.0050		ug/g	
			Benzo(k)fluoranthene	2025/01/23	<0.0050		ug/g	

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chrysene	2025/01/23	<0.0050		ug/g	
			Dibenzo(a,h)anthracene	2025/01/23	<0.0050		ug/g	
			Fluoranthene	2025/01/23	<0.0050		ug/g	
			Fluorene	2025/01/23	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2025/01/23	<0.0050		ug/g	
			1-Methylnaphthalene	2025/01/23	<0.0050		ug/g	
			2-Methylnaphthalene	2025/01/23	<0.0050		ug/g	
			Naphthalene	2025/01/23	<0.0050		ug/g	
			Phenanthrene	2025/01/23	<0.0050		ug/g	
			Pyrene	2025/01/23	<0.0050		ug/g	
			Benzo(b)fluoranthene	2025/01/23	<0.0030		ug/g	
			Perylene	2025/01/23	<0.0050		ug/g	
			Benzo(j)fluoranthene	2025/01/23	<0.0030		ug/g	
9863861	JYO	RPD	Acenaphthene	2025/01/23	NC		%	40
			Acenaphthylene	2025/01/23	NC		%	40
			Anthracene	2025/01/23	NC		%	40
			Benzo(a)anthracene	2025/01/23	NC		%	40
			Benzo(a)pyrene	2025/01/23	NC		%	40
			Benzo(b/j)fluoranthene	2025/01/23	NC		%	40
			Benzo(g,h,i)perylene	2025/01/23	NC		%	40
			Benzo(k)fluoranthene	2025/01/23	NC		%	40
			Chrysene	2025/01/23	NC		%	40
			Dibenzo(a,h)anthracene	2025/01/23	NC		%	40
			Fluoranthene	2025/01/23	NC		%	40
			Fluorene	2025/01/23	NC		%	40
			Indeno(1,2,3-cd)pyrene	2025/01/23	NC		%	40
			1-Methylnaphthalene	2025/01/23	NC		%	40
			2-Methylnaphthalene	2025/01/23	NC		%	40
			Naphthalene	2025/01/23	NC		%	40
			Phenanthrene	2025/01/23	NC		%	40
			Pyrene	2025/01/23	NC		%	40
9864186	LFE	Matrix Spike	D10-Anthracene	2025/01/24		97	%	50 - 130
			D14-Terphenyl (FS)	2025/01/24		100	%	50 - 130
			D8-Acenaphthylene	2025/01/24		93	%	50 - 130
			Acenaphthene	2025/01/24		95	%	50 - 130
			Acenaphthylene	2025/01/24		93	%	50 - 130
			Anthracene	2025/01/24		102	%	50 - 130
			Benzo(a)anthracene	2025/01/24		99	%	50 - 130
			Benzo(a)pyrene	2025/01/24		97	%	50 - 130
			Benzo(b/j)fluoranthene	2025/01/24		101	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/24		103	%	50 - 130
			Benzo(k)fluoranthene	2025/01/24		100	%	50 - 130
			Chrysene	2025/01/24		97	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/24		94	%	50 - 130
			Fluoranthene	2025/01/24		99	%	50 - 130
			Fluorene	2025/01/24		100	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/24		108	%	50 - 130
			1-Methylnaphthalene	2025/01/24		99	%	50 - 130
			2-Methylnaphthalene	2025/01/24		101	%	50 - 130
			Naphthalene	2025/01/24		86	%	50 - 130
			Phenanthrene	2025/01/24		91	%	50 - 130
			Pyrene	2025/01/24		100	%	50 - 130
			Benzo(b)fluoranthene	2025/01/24		109	%	50 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perylene	2025/01/24		97	%	50 - 130
			Benzo(j)fluoranthene	2025/01/24		93	%	50 - 130
9864186	LFE	Spiked Blank	D10-Anthracene	2025/01/24		102	%	50 - 130
			D14-Terphenyl (FS)	2025/01/24		103	%	50 - 130
			D8-Acenaphthylene	2025/01/24		100	%	50 - 130
			Acenaphthene	2025/01/24		100	%	50 - 130
			Acenaphthylene	2025/01/24		96	%	50 - 130
			Anthracene	2025/01/24		108	%	50 - 130
			Benzo(a)anthracene	2025/01/24		102	%	50 - 130
			Benzo(a)pyrene	2025/01/24		100	%	50 - 130
			Benzo(b/j)fluoranthene	2025/01/24		106	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/24		106	%	50 - 130
			Benzo(k)fluoranthene	2025/01/24		117	%	50 - 130
			Chrysene	2025/01/24		100	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/24		84	%	50 - 130
			Fluoranthene	2025/01/24		109	%	50 - 130
			Fluorene	2025/01/24		106	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/24		106	%	50 - 130
			1-Methylnaphthalene	2025/01/24		102	%	50 - 130
			2-Methylnaphthalene	2025/01/24		105	%	50 - 130
			Naphthalene	2025/01/24		89	%	50 - 130
			Phenanthrene	2025/01/24		99	%	50 - 130
			Pyrene	2025/01/24		110	%	50 - 130
			Benzo(b)fluoranthene	2025/01/24		110	%	50 - 130
			Perylene	2025/01/24		102	%	50 - 130
			Benzo(j)fluoranthene	2025/01/24		102	%	50 - 130
9864186	LFE	Method Blank	D10-Anthracene	2025/01/24		105	%	50 - 130
			D14-Terphenyl (FS)	2025/01/24		103	%	50 - 130
			D8-Acenaphthylene	2025/01/24		97	%	50 - 130
			Acenaphthene	2025/01/24	<0.0050		ug/g	
			Acenaphthylene	2025/01/24	<0.0050		ug/g	
			Anthracene	2025/01/24	<0.0050		ug/g	
			Benzo(a)anthracene	2025/01/24	<0.0050		ug/g	
			Benzo(a)pyrene	2025/01/24	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2025/01/24	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2025/01/24	<0.0050		ug/g	
			Benzo(k)fluoranthene	2025/01/24	<0.0050		ug/g	
			Chrysene	2025/01/24	<0.0050		ug/g	
			Dibenzo(a,h)anthracene	2025/01/24	<0.0050		ug/g	
			Fluoranthene	2025/01/24	<0.0050		ug/g	
			Fluorene	2025/01/24	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2025/01/24	<0.0050		ug/g	
			1-Methylnaphthalene	2025/01/24	<0.0050		ug/g	
			2-Methylnaphthalene	2025/01/24	<0.0050		ug/g	
			Naphthalene	2025/01/24	<0.0050		ug/g	
			Phenanthrene	2025/01/24	<0.0050		ug/g	
			Pyrene	2025/01/24	<0.0050		ug/g	
			Benzo(b)fluoranthene	2025/01/24	<0.0030		ug/g	
			Perylene	2025/01/24	<0.0050		ug/g	
			Benzo(j)fluoranthene	2025/01/24	<0.0030		ug/g	
9864186	LFE	RPD	Acenaphthene	2025/01/24	NC		%	40
			Acenaphthylene	2025/01/24	NC		%	40
			Anthracene	2025/01/24	113 (3)		%	40

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(a)anthracene	2025/01/24	123 (3)		%	40
			Benzo(a)pyrene	2025/01/24	108 (3)		%	40
			Benzo(b/j)fluoranthene	2025/01/24	102 (3)		%	40
			Benzo(g,h,i)perylene	2025/01/24	95 (3)		%	40
			Benzo(k)fluoranthene	2025/01/24	117 (3)		%	40
			Chrysene	2025/01/24	123 (3)		%	40
			Dibenzo(a,h)anthracene	2025/01/24	29		%	40
			Fluoranthene	2025/01/24	132 (3)		%	40
			Fluorene	2025/01/24	32		%	40
			Indeno(1,2,3-cd)pyrene	2025/01/24	99 (3)		%	40
			1-Methylnaphthalene	2025/01/24	6.1		%	40
			2-Methylnaphthalene	2025/01/24	34		%	40
			Naphthalene	2025/01/24	NC		%	40
			Phenanthrene	2025/01/24	142 (3)		%	40
			Pyrene	2025/01/24	122 (3)		%	40
9864189	RAJ	Matrix Spike	D10-Anthracene	2025/01/24		95	%	50 - 130
			D14-Terphenyl (FS)	2025/01/24		84	%	50 - 130
			D8-Acenaphthylene	2025/01/24		75	%	50 - 130
			Acenaphthene	2025/01/24		87	%	50 - 130
			Acenaphthylene	2025/01/24		80	%	50 - 130
			Anthracene	2025/01/24		100	%	50 - 130
			Benzo(a)anthracene	2025/01/24		92	%	50 - 130
			Benzo(a)pyrene	2025/01/24		92	%	50 - 130
			Benzo(b/j)fluoranthene	2025/01/24		98	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/24		99	%	50 - 130
			Benzo(k)fluoranthene	2025/01/24		104	%	50 - 130
			Chrysene	2025/01/24		90	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/24		81	%	50 - 130
			Fluoranthene	2025/01/24		94	%	50 - 130
			Fluorene	2025/01/24		93	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/24		102	%	50 - 130
			1-Methylnaphthalene	2025/01/24		74	%	50 - 130
			2-Methylnaphthalene	2025/01/24		73	%	50 - 130
			Naphthalene	2025/01/24		61	%	50 - 130
			Phenanthrene	2025/01/24		90	%	50 - 130
			Pyrene	2025/01/24		96	%	50 - 130
			Benzo(b)fluoranthene	2025/01/24		94	%	50 - 130
			Perylene	2025/01/24		96	%	50 - 130
			Benzo(j)fluoranthene	2025/01/24		102	%	50 - 130
9864189	RAJ	Spiked Blank	D10-Anthracene	2025/01/24		102	%	50 - 130
			D14-Terphenyl (FS)	2025/01/24		91	%	50 - 130
			D8-Acenaphthylene	2025/01/24		92	%	50 - 130
			Acenaphthene	2025/01/24		98	%	50 - 130
			Acenaphthylene	2025/01/24		91	%	50 - 130
			Anthracene	2025/01/24		107	%	50 - 130
			Benzo(a)anthracene	2025/01/24		98	%	50 - 130
			Benzo(a)pyrene	2025/01/24		96	%	50 - 130
			Benzo(b/j)fluoranthene	2025/01/24		109	%	50 - 130
			Benzo(g,h,i)perylene	2025/01/24		105	%	50 - 130
			Benzo(k)fluoranthene	2025/01/24		98	%	50 - 130
			Chrysene	2025/01/24		94	%	50 - 130
			Dibenzo(a,h)anthracene	2025/01/24		82	%	50 - 130
			Fluoranthene	2025/01/24		100	%	50 - 130

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Fluorene	2025/01/24		101	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2025/01/24		101	%	50 - 130
			1-Methylnaphthalene	2025/01/24		93	%	50 - 130
			2-Methylnaphthalene	2025/01/24		95	%	50 - 130
			Naphthalene	2025/01/24		87	%	50 - 130
			Phenanthrene	2025/01/24		96	%	50 - 130
			Pyrene	2025/01/24		102	%	50 - 130
			Benzo(b)fluoranthene	2025/01/24		108	%	50 - 130
			Perylene	2025/01/24		102	%	50 - 130
			Benzo(j)fluoranthene	2025/01/24		111	%	50 - 130
9864189	RAJ	Method Blank	D10-Anthracene	2025/01/24		110	%	50 - 130
			D14-Terphenyl (FS)	2025/01/24		92	%	50 - 130
			D8-Acenaphthylene	2025/01/24		90	%	50 - 130
			Acenaphthene	2025/01/24	<0.0050		ug/g	
			Acenaphthylene	2025/01/24	<0.0050		ug/g	
			Anthracene	2025/01/24	<0.0050		ug/g	
			Benzo(a)anthracene	2025/01/24	<0.0050		ug/g	
			Benzo(a)pyrene	2025/01/24	<0.0050		ug/g	
			Benzo(b/j)fluoranthene	2025/01/24	<0.0050		ug/g	
			Benzo(g,h,i)perylene	2025/01/24	<0.0050		ug/g	
			Benzo(k)fluoranthene	2025/01/24	<0.0050		ug/g	
			Chrysene	2025/01/24	<0.0050		ug/g	
			Dibenzo(a,h)anthracene	2025/01/24	<0.0050		ug/g	
			Fluoranthene	2025/01/24	<0.0050		ug/g	
			Fluorene	2025/01/24	<0.0050		ug/g	
			Indeno(1,2,3-cd)pyrene	2025/01/24	<0.0050		ug/g	
			1-Methylnaphthalene	2025/01/24	<0.0050		ug/g	
			2-Methylnaphthalene	2025/01/24	<0.0050		ug/g	
			Naphthalene	2025/01/24	<0.0050		ug/g	
			Phenanthrene	2025/01/24	<0.0050		ug/g	
			Pyrene	2025/01/24	<0.0050		ug/g	
			Benzo(b)fluoranthene	2025/01/24	<0.0030		ug/g	
			Perylene	2025/01/24	<0.0050		ug/g	
			Benzo(j)fluoranthene	2025/01/24	<0.0030		ug/g	
9864189	RAJ	RPD	Acenaphthene	2025/01/24	NC		%	40
			Acenaphthylene	2025/01/24	NC		%	40
			Anthracene	2025/01/24	NC		%	40
			Benzo(a)anthracene	2025/01/24	NC		%	40
			Benzo(a)pyrene	2025/01/24	NC		%	40
			Benzo(b/j)fluoranthene	2025/01/24	NC		%	40
			Benzo(g,h,i)perylene	2025/01/24	NC		%	40
			Benzo(k)fluoranthene	2025/01/24	NC		%	40
			Chrysene	2025/01/24	NC		%	40
			Dibenzo(a,h)anthracene	2025/01/24	NC		%	40
			Fluoranthene	2025/01/24	NC		%	40
			Fluorene	2025/01/24	NC		%	40
			Indeno(1,2,3-cd)pyrene	2025/01/24	NC		%	40
			1-Methylnaphthalene	2025/01/24	NC		%	40
			2-Methylnaphthalene	2025/01/24	NC		%	40
			Naphthalene	2025/01/24	NC		%	40
			Phenanthrene	2025/01/24	NC		%	40
			Pyrene	2025/01/24	NC		%	40
			Benzo(b)fluoranthene	2025/01/24	NC		%	40

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perylene	2025/01/24	NC		%	50
			Benzo(j)fluoranthene	2025/01/24	NC		%	40

N/A = Not Applicable

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

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

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

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

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

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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

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

(1) Poor spike recovery due to probable sample matrix interference.

(2) Poor RPD due to sample inhomogeneity. Verified by repeat digestion and analysis.

(3) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

Bureau Veritas Job #: C504742
Report Date: 2025/01/27

ARCADIS Canada Inc
Client Project #: 30235902-01
Site Location: SILICA LAKE
Sampler Initials: RS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ernlie Publicover, Scientific Specialist

Janah Rhyno, Scientific Specialist

Louise Harding, Scientific Specialist

Phil Deveau, Scientific Specialist (Organics)

Bureau Veritas Certified by Janah Rhyno, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Suzanne Rogers, General Manager responsible for Nova Scotia Environmental laboratory operations.

Bureau Veritas 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.bvna.com

EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com / torontolab@emsl.com

EMSL Canada Order 552502178
Customer ID: 55ARCD75
Customer PO: 30235902
Project ID:

Attn: Randy Fancey
Arcadis Canada Inc.
1645 Granville Street
Halifax, NS B3J 1X3

Phone: (416) 702-6948
Fax:
Collected:
Received: 2/04/2025
Analyzed: 2/11/2025

Proj: S Lake/30235902

Summary Test Report for Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace

Client Sample ID: 1-A ***Lab Sample ID:*** **552502178-0001**
Sample Description: Exterior/Refractory Brick - Yellow Coloured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 1-B ***Lab Sample ID:*** **552502178-0002**
Sample Description: Exterior/Refractory Brick - Yellow Coloured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 1-C ***Lab Sample ID:*** **552502178-0003**
Sample Description: Exterior/Refractory Brick - Yellow Coloured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 2-A-Brick ***Lab Sample ID:*** **552502178-0004**
Sample Description: Exterior/Brick - Red Coloured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Red	0.0%	100.0%	None Detected	

Client Sample ID: 2-A-Mastic ***Lab Sample ID:*** **552502178-0004A**
Sample Description: Exterior/Brick - Red Coloured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Black	0.0%	100.0%	None Detected	

Client Sample ID: 2-B ***Lab Sample ID:*** **552502178-0005**
Sample Description: Exterior/Brick - Red Coloured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Red	0.0%	100.0%	None Detected	

Client Sample ID: 2-C ***Lab Sample ID:*** **552502178-0006**
Sample Description: Exterior/Brick - Red Coloured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Red	0.0%	100.0%	None Detected	

EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com / torontolab@emsl.com

EMSL Canada Order 552502178
Customer ID: 55ARCD75
Customer PO: 30235902
Project ID:

Summary Test Report for Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace

Client Sample ID: 3-A-Brick **Lab Sample ID:** **552502178-0007**
Sample Description: Exterior/Mortar on Red Coloured Brick

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Red	0.0%	100.0%	None Detected	

Client Sample ID: 3-A-Mortar 1 **Lab Sample ID:** **552502178-0007A**
Sample Description: Exterior/Mortar on Red Coloured Brick

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Red	0.0%	100.0%	None Detected	

Client Sample ID: 3-A-Mortar 2 **Lab Sample ID:** **552502178-0007B**
Sample Description: Exterior/Mortar on Red Coloured Brick

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 3-B **Lab Sample ID:** **552502178-0008**
Sample Description: Exterior/Mortar on Red Coloured Brick

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Red	0.0%	100.0%	None Detected	

Client Sample ID: 3-C-Brick **Lab Sample ID:** **552502178-0009**
Sample Description: Exterior/Mortar on Red Coloured Brick

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Red	0.0%	100.0%	None Detected	

Client Sample ID: 3-C-Mortar 1 **Lab Sample ID:** **552502178-0009A**
Sample Description: Exterior/Mortar on Red Coloured Brick

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Brown/Red	0.0%	100.0%	None Detected	

Client Sample ID: 3-C-Mortar 2 **Lab Sample ID:** **552502178-0009B**
Sample Description: Exterior/Mortar on Red Coloured Brick

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	2/11/2025	Gray	0.0%	100.0%	None Detected	

EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
http://www.EMSL.com / torontolab@emsl.com

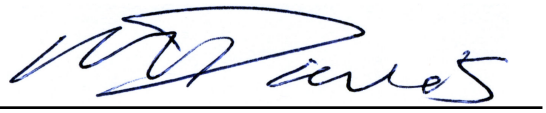
EMSL Canada Order 552502178
Customer ID: 55ARCD75
Customer PO: 30235902
Project ID:

Summary Test Report for Asbestos Analysis of Bulk Materials for Nova Scotia Code of Practice Section 66 OHS Act - Asbestos in the Workplace

Analyst(s):

Antonio Peluso PLM (9)
Diana Costantino PLM (5)

Reviewed and approved by:



Matthew Davis or other approved signatory
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This is a summary report; official reports are available on LabConnect or upon request and relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 02/11/202513:18:45

Appendix D

Project Quality Assurance and Quality Control Review

Appendix D Data Quality Assessment

Well-defined Quality Assurance/Quality Control (QA/QC) procedures are crucial to both high quality field sampling methodologies and laboratory analysis, so that reliable data are collected that accurately represents site conditions. Strict adherence to these procedures forms the basis for an acceptable field sampling quality assurance program. This Appendix discusses the environmental site assessment data quality.

The concentrations of contaminants of potential concern in the blind field duplicate soil and groundwater samples are presented in Tables D1 - D4 of this appendix. The Certificates of Analysis for these samples are provided in Appendix C. Samples were taken in the field following the Arcadis Canada Inc. (ACI) standard operating procedures (SOP) methodology. All analyses of samples were carried out by Bureau Veritas (BV) in Bedford, Nova Scotia. BV is accredited by the Standards Council of Canada.

D.1 Data Validation

Data validation was provided by laboratory and field QA/QC procedures discussed herein. ACI internal QA/QC procedures included strict adherence to the SOP procedures, proper staff training and oversight, daily preparation, and completions of tasks. The internal SOPs are in compliance with industry standard requirements.

Daily data collected and compiled on-site during site assessment activities has been compiled in this report.

D.2 Laboratory QA/QC Summary

The BV QA/QC program included adherence to laboratory sampling and analysis protocols and the analysis of laboratory method blanks, laboratory sample control (blank spike), laboratory duplicates, surrogate recovery, and matrix spikes.

Laboratory method blank samples are free of the target analytes and are analyzed through the sample analytical method than the test samples. Method blank results are used to detect interferences or impurities introduced by the laboratory equipment, reagents, or solvents.

Laboratory control samples are fortified with a known concentration of the select target analytes and then analyzed through the same analytical method as the test samples. Laboratory control samples are used to monitor the analytes recovery and validate the calibration of the instrumentation.

For laboratory duplicate samples, a second aliquot from a randomly selected sample within an analytical batch is processed through the same analytical method. Laboratory duplicate sample results are used to evaluate the reproducibility of the analytical method.

Surrogate recovery is analyzed for organic parameters by spiking samples with known quantities of surrogate chemicals which have similar chemical properties to the parameters being analyzed. The reported recovery provides an indication of the analytical method accuracy for that sample.

Matrix spikes were conducted by adding known concentrations of the analyte of interest to a sample to evaluate the effects of the sample matrix on the analytical methods.

D.3 Field Duplicate QA/QC

A field QA/QC program was implemented during the assessment program to minimize and allow for identification of any potential problems arising from sample collection, handling, shipping, and analysis. As part of the QA/QC program, sample protocols include minimizing sample handling, submitting field QA/QC samples, using dedicated non-contaminating sampling equipment, using specific identification, labelling procedures, and using chain of custody records were implemented.

As part of this field program, one blind field duplicate soil sample (DUP-A) and one blind field duplicate groundwater sample (DUP-A) were submitted to BV for analysis.

For the blind field duplicate samples, evaluations of the QA/QC results were determined by calculating the relative percent difference (RPD) between field duplicate and original (parent) sample results, and comparison of the RPD to designated alert limits. The RPD values between the original samples and their blind field duplicates were calculated as follows:

$$RPD\% = \frac{(C_1 - C_2)}{\frac{(C_1 + C_2)}{2}} X\ 100$$

Where:

RPD = relative percent difference
C_1 = measured concentration in the field parent sample
C_2 = measured concentration in the blind field duplicate

Consistent with laboratory practices, meaningful RPD values for field duplicate analyses were calculated only where the average of the detected concentrations in both samples was greater than five (5) times the reportable detection limit.

The following QA/QC limits (i.e., RPD values), were used as the alarm limits to evaluate the analytical data:

Metals	80% Water/100% Soil
PAHs/PHCs	80% Water/100% Soil
General Chemistry	50% Water/100% Soil

D.4 Summary of Data Quality Review Results

Appendix C presents the Certificates of Analysis for the samples collected during the site assessment. The signed QA/QC review forms, indicating that the laboratory QA/QC results are acceptable, are also included in Appendix C.

As part of this field QC program, one blind field duplicate soil sample (DUP A, a blind field duplicate sample of SS2) and one blind duplicate groundwater sample (DUP A, a blind field duplicate sample of MW2) were submitted for analysis. The RPD calculations and QC results are presented in Tables D1 to D4. The RPD values for the original and the blind field duplicate samples were within the QA/QC limits with the following exceptions:

Metals in Soil (SS2 and DUP-A)

- The tin RPD value of -113.0 exceeds the QA/QC limit of +/-100: The RPD values for the other metal parameters ranged from -6.1 to -33.0, all of which are below the QA/QC limit. It is assumed the RPD violation is a result of inhomogeneity in the two soil samples. The tin concentrations in the two samples (15 and 54 mg/kg) exceed the Tier I EQS and do not impact the data.

PAHs in Soil (SS2 and DUP-A)

- The RPD values for four PAH parameters range from -171.0 to -172.2, which exceed the QA/QC limit of +/-100. The RPD violations are assumed to be attributed to the inhomogeneity in the two soil samples.

The RPD calculations for the original and the blind field duplicate sample are presented in Tables D1 – D4.

D.5 QA/QC Conclusions

Overall, the laboratory and field QC results confirm that sample handling and analytical protocols were acceptable, and the analytical results are considered to be representative.

TABLE D1
RPD Calculations - Metals In Soil
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV Labs ID*	UNITS	RDL	Soil Samples		RPD	QA/QC Limit	QA/QC Compliance
			SS2	DUP-A (SS2)			
			2025-01-15	2025-01-15			
			ANFV64	ANFV67			
Aluminum	mg/kg	10	8400	9800	-15.4	100	Y
Antimony	mg/kg	2.0	3.5	5.7	CNC	100	N/A
Arsenic	mg/kg	2.0	4.0	4.3	CNC	100	N/A
Barium	mg/kg	5.0	38	40	-5.1	100	Y
Beryllium	mg/kg	1.0	<0.50	<0.50	CNC	100	N/A
Bismuth	mg/kg	2.0	<2.0	<2.0	CNC	100	N/A
Boron	mg/kg	50	<50	<50	CNC	100	N/A
Cadmium	mg/kg	0.30	<0.30	<0.30	CNC	100	N/A
Chromium	mg/kg	2.0	16	17	-6.1	100	Y
Cobalt	mg/kg	1.0	6.8	8.3	-19.9	100	Y
Copper	mg/kg	2.0	19	24	-23.3	100	Y
Iron	mg/kg	50	**20000**	**25000**	-22.2	100	Y
Lead	mg/kg	0.50	38	53	-33.0	100	Y
Lithium	mg/kg	2.0	13	14	-7.4	100	Y
Manganese	mg/kg	2.0	270	330	-20.0	100	Y
Mercury	mg/kg	0.10	<0.10	<0.10	CNC	100	N/A
Molybdenum	mg/kg	2.0	<2.0	<2.0	CNC	100	N/A
Nickel	mg/kg	2.0	13	14	-7.4	100	Y
Rubidium	mg/kg	2.0	5.6	5.3	CNC	100	N/A
Selenium	mg/kg	0.50	<0.50	<0.50	CNC	100	N/A
Silver	mg/kg	0.50	<0.50	<0.50	CNC	100	N/A
Strontium	mg/kg	5.0	12	13	CNC	100	N/A
Thallium	mg/kg	0.10	<0.10	<0.10	CNC	100	N/A
Tin	mg/kg	1.0	15	54	**-113.0**	100	**N**
Uranium	mg/kg	0.10	0.46	0.54	CNC	100	N/A
Vanadium	mg/kg	2.0	29	37	-24.2	100	Y
Zinc	mg/kg	5.0	65	76	-15.6	100	Y

Dup A: Blind Field Duplicate of SS2
RDL: Reportable Detection Limit
RPD: Relative Precent Difference
<: Concentration is less than reportable detection limit
CNC Could Not Calculate (concentrations are less than 5X RDL)
N/A: Not Applicable
QA/QC Limit Violation

TABLE D2
RPD Calculations - Polycyclic Aromatic Hydrocarbons In Soil
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL*	Soil Samples		RPD	QA/QC Limit	QA/QC Compliance
			SS2	DUP-A (SS2)			
			2025-01-14	2025-01-14			
			ANFV64	ANFV67			
1-Methylnaphthalene	mg/kg	0.050	< 0.0050	< 0.050	CNC	100	N/A
2-Methylnaphthalene	mg/kg	0.050	< 0.0050	< 0.050	CNC	100	N/A
Acenaphthene	mg/kg	0.050	0.0095	0.11	CNC	100	N/A
Acenaphthylene	mg/kg	0.050	0.032	0.38	CNC	100	N/A
Anthracene	mg/kg	0.050	0.056	0.81	CNC	100	N/A
Benzo(a)anthracene	mg/kg	0.050	0.18	2.4	CNC	100	N/A
Benzo(a)pyrene	mg/kg	0.050	0.20	2.6	CNC	100	N/A
Benzo(b)fluoranthene	mg/kg	0.030	0.16	2.0	CNC	100	N/A
Benzo(b/j)fluoranthene	mg/kg	0.050	0.25	3.2	**-171.0**	100	**N**
Benzo(g,h,i)perylene	mg/kg	0.050	0.12	1.5	CNC	100	N/A
Benzo(j)fluoranthene	mg/kg	0.030	0.097	1.2	CNC	100	N/A
Benzo(k)fluoranthene	mg/kg	0.050	0.089	1.1	CNC	100	N/A
Chrysene	mg/kg	0.050	0.19	2.5	CNC	100	N/A
Dibenzo(a,h)anthracene	mg/kg	0.050	0.026	0.33	CNC	100	N/A
Fluoranthene	mg/kg	0.050	0.54	7.0	**-171.4**	100	**N**
Fluorene	mg/kg	0.050	0.016	0.23	CNC	100	N/A
Indeno(1,2,3-cd)pyrene	mg/kg	0.050	0.14	1.7	CNC	100	N/A
Naphthalene	mg/kg	0.050	0.0061	0.059	CNC	100	N/A
Perylene	mg/kg	0.050	0.047	0.64	CNC	100	N/A
Phenanthrene	mg/kg	0.050	0.33	4.4	**-172.1**	100	**N**
Pyrene	mg/kg	0.050	0.44	5.9	**-172.2**	100	**N**

Dup-A: Blind field duplicate sample of SS2
RDL: Reportable detection limit. RDLs varried between samples.
RPD: Relative Precent Difference
<: Concentration is less than reportable detection limit
CNC Could Not Calculate (concentrations are less than 5X RDL)
N/A: Not applicable
Bold: RPD Violation

TABLE D3
RPD Calculations - General Chemistry In Groundwater
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	Groundwater Samples		RPD	QA/QC Limit	QA/QC Compliance
			MW2	DUP-A			
			2025-01-14	2025-01-14			
			ANFV55	ANFV57			
Calculated Parameters							
Anion Sum	me/L	N/A	2.19	2.19	CNC	-	N/A
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1.0	100	100	0.0	50	Y
Calculated TDS	mg/L	1.0	140	140	0.0	50	Y
Carb. Alkalinity (calc. as CaCO3)	mg/L	1.0	<1.0	<1.0	CNC	50	N/A
Cation Sum	me/L	N/A	2.57	2.56	CNC	50	N/A
Hardness (CaCO3)	mg/L	1.0	110	110	0.0	50	Y
Ion Balance (% Difference)	%	N/A	7.98	7.79	CNC	-	N/A
Langelier Index (@ 20C)	N/A		-0.130	-0.0430	CNC	-	N/A
Langelier Index (@ 4C)	N/A		-0.381	-0.293	CNC	-	N/A
Nitrate (N)	mg/L	0.050	<0.050	<0.050	CNC	50	N/A
Saturation pH (@ 20C)	N/A		7.77	7.77	CNC	-	N/A
Saturation pH (@ 4C)	N/A		8.02	8.02	CNC	-	N/A
Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L	2.0	100	100	0.0	50	Y
Dissolved Chloride (Cl-)	mg/L	1.0	3.3	3.3	CNC	50	N/A
Colour	TCU	5.0	13	14	CNC	50	N/A
Nitrate + Nitrite (N)	mg/L	0.050	<0.050	<0.050	CNC	50	N/A
Nitrite (N)	mg/L	0.010	<0.010	<0.010	CNC	50	N/A
Nitrogen (Ammonia Nitrogen)	mg/L	0.050	0.23	0.24	CNC	50	N/A
Total Organic Carbon (C)	mg/L	5.0	8.4 (1)	7.9 (1)	CNC	50	N/A
Orthophosphate (P)	mg/L	0.010	<0.010	<0.010	CNC	50	N/A
pH	pH		7.63	7.72	CNC	-	N/A
Reactive Silica (SiO2)	mg/L	1.0	23	22	4.4	50	Y
Dissolved Sulphate (SO4)	mg/L	2.0	<2.0	<2.0	CNC	50	N/A
Turbidity	NTU	1.0	810	730	10.4	50	Y
Conductivity	uS/cm	1.0	240	240	0.0	50	Y

Dup-A: Blind field duplicate sample of SS2
RDL: Reportable Detection Limit
RPD: Relative Precent Difference
<: Concentration is less than reportable detection limit
CNC Could Not Calculate (concentrations are less than 5X RDL)
N/A: Not applicable

TABLE 4
RPD Calculations - Metals In Groundwater
Phase II ESA, Former Silica Lake Mine, Castlereagh, Nova Scotia

Parameter / *Sample ID* / *Sample Date (Y/M/D)* / *BV ID*	UNITS	RDL	Groundwater Samples		RPD	QA/QC Limit	QA/QC Compliance
			MW2	DUP-A (MW2)			
			025/01/14	025/01/14			
			ANFV55	ANFV57			
Aluminum	ug/L	5.0	<5.0	<5.0	CNC	80	N/A
Antimony	ug/L	1.0	<1.0	<1.0	CNC	80	N/A
Arsenic	ug/L	1.0	<1.0	<1.0	CNC	80	N/A
Barium	ug/L	1.0	230	220	4.4	80	Y
Beryllium	ug/L	0.10	<0.10	<0.10	CNC	80	N/A
Bismuth	ug/L	2.0	<2.0	<2.0	CNC	80	N/A
Boron	ug/L	50	<50	<50	CNC	80	N/A
Cadmium	ug/L	0.010	0.070	0.11	-44.4	80	Y
Calcium	ug/L	100	38000	38000	0.0	80	Y
Chromium	ug/L	1.0	<1.0	1.4	CNC	80	N/A
Cobalt	ug/L	0.40	0.40	0.50	CNC	80	N/A
Copper	ug/L	0.50	3.0	4.4	-37.8	80	Y
Iron	ug/L	50	<50	57	CNC	80	N/A
Lead	ug/L	0.50	<0.50	<0.50	CNC	80	N/A
Magnesium	ug/L	100	4700	4700	0.0	80	Y
Manganese	ug/L	2.0	1100	1300	-16.7	80	Y
Molybdenum	ug/L	2.0	2.1	2.1	CNC	80	N/A
Nickel	ug/L	2.0	<2.0	<2.0	CNC	80	N/A
Phosphorus	ug/L	100	<100	<100	CNC	80	N/A
Potassium	ug/L	100	2000	2200	-9.5	80	Y
Selenium	ug/L	0.50	<0.50	<0.50	CNC	80	N/A
Silver	ug/L	0.10	<0.10	<0.10	CNC	80	N/A
Sodium	ug/L	100	5100	5000	2.0	80	Y
Strontium	ug/L	2.0	100	100	0.0	80	Y
Thallium	ug/L	0.10	<0.10	<0.10	CNC	80	N/A
Tin	ug/L	2.0	<2.0	<2.0	CNC	80	N/A
Titanium	ug/L	2.0	<2.0	<2.0	CNC	80	N/A
Uranium	ug/L	0.10	0.20	0.26	CNC	80	N/A
Vanadium	ug/L	2.0	<2.0	<2.0	CNC	80	N/A
Zinc	ug/L	5.0	<5.0	<5.0	CNC	80	N/A

Dup A: Blind Field Duplicate of MW2
RDL: Reportable Detection Limit
RPD: Relative Precent Difference
<: Concentration is less than reportable detection limit
CNC Could Not Calculate (concentraions are less than 5X RDL)
N/A: Not Applicable

168 Hobsons Lake Dr, Suite 301
Halifax, Nova Scotia
B3S 0G4
www.arcadis.com