Appendix E.8

Final (Revised) – Extended Phase II Environmental Site Assessment
Beaver Dam Project Property - March 8, 2021
Completed for the Updated 2021 Beaver Dam Mine EIS

FINAL (Revised) – EXTENDED PHASE II ENVIRONMENTAL SITE ASSESSMENT – BEAVER DAM PROJECT PROPERTY

181 Beaver Dam Mines Road, Marinette, NS

March 8, 2021

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Note to Reader:

The current report titled: "**Final (Revised) – Extended Phase II Environmental Site Assessment – Beaver Dam Project Property"** was re-issued from the Final version dated February 11th, 2021 due to the inclusion of "Final" report versions for the Phase I and Phase II Environmental Site Assessments for Beaver Dam found in Appendix G.

Executive Summary

At the request of Atlantic Mining NS Inc. (AMNS), Stantec Consulting Ltd. (Stantec) conducted an Extended Phase II Environmental Site Assessment (ESA) of the proposed Beaver Dam Project property (the Site) located in Marinette, Nova Scotia (NS).

The Extended Phase II ESA was completed as part of project feasibility due diligence which is underway as part of an Environmental Assessment for the potential re-development of the gold mine at the Site (the Project). The purpose of the Extended Phase II ESA is to assess soil, sediment, and surface water conditions with respect to historical mining operations including tailings and waste rock disposal areas identified in our Phase I ESA, and to complete further environmental assessment at the Site following our previous Limited Phase II ESA. The Extended Phase II ESA's objectives include the following:

- Address changes in the proposed configuration of the pit and associated mine infrastructure since the initial Phase II ESA screening was completed.
- Address potential concerns arising from regulators during the Project permitting process.

Stantec conducted field activities as part of the Extended Phase II ESA between July 20 and 28, 2020. Stantec conducted a visual assessment of the Site, excavated and collected soil samples from 65 test pits, collected sediment samples at 13 locations, and collected surface water samples at five locations.

The area of the proposed open pit appears to be largely reworked ground surrounding a historical settling pond. Suspected tailings were observed within the proposed open pit area near the historical settling pond, north of Crusher Lake between the lake and the proposed road, and to the north of the proposed road near the historical Mill Shaft Pit area (proposed topsoil/sub-soil stockpile [TSSP] area). Several trenches and pits with nearby suspected waste rock were located within the proposed pit area, to the south and east of the pit area, north of Crusher Lake between the lake and the proposed road, and to the north of the proposed road near the historical Mill Shaft Pit area (proposed TSSP area). These trenches and pits are suspected to be historical mine workings.

Based on the information gathered and on observations made during this assessment and the Limited Phase II ESA, Stantec provides the following conclusions related to potential environmental contamination associated with historical gold mining operations:

- Concentrations of arsenic in soil exceeding the applicable NSE Tier 1 Environmental Quality Standards (EQS) were identified in 72 of the 95 test pit locations. Some of these locations are considered non-impacted and are potentially indicative of background soil concentrations.
- Twenty-nine of the 65 test pits advanced during the Extended Phase II ESA work in 2020 are classified as likely impacted by historical tailings or waste rock based on field observations, arsenic levels, and proximity to historical site features.
- Arsenic in soil at levels considered to represent impacts from historical mining operations intersects with areas of proposed Site infrastructure, including the proposed open pit.

- Concentrations of arsenic in sediment exceeding the applicable Interim Sediment Quality Guideline (ISQG) and Tier 1 EQS were identified in 10 of 13 sample locations; nine of those locations also had concentrations exceeding the Probable Effect Level (PEL). Concentrations of cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, strontium, and/or zinc exceeded guidelines at 12 of 13 sample locations. One sediment sample was analysed for petroleum hydrocarbons (PHC) based on hydrocarbon odour, and modified total petroleum hydrocarbons (TPH) exceeded the applicable Tier 1 EQS.
- Concentrations of arsenic in surface water exceeding the Tier 1 EQS were identified in two of nine sampling locations. Concentrations of aluminum, cadmium, chromium, and/or iron exceeded guidelines at all sampling locations and may represent background conditions.

The statements made in this Executive Summary are subject to the same limitations as Section 6.0 and are meant to be read in conjunction with the remainder of this report.

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Stantec Consulting Ltd., 2019. Limited Phase II Environmental Site Assessment – Beaver Dam Property, 181 Beaver Dam Mines Rd., Marinette, NS. Prepared for Atlantic Mining NS Corporation. August 23, 2019. (Stantec 2019b)

Referenced Geology Maps: Keppie, J. D. (compiler). 2000. "Geological Map of the Province of Nova Scotia, Nova Scotia Department of Natural Resources, Minerals and Energy Branch. Map ME 2000-1" and Stea, R. R., Conley, H., and Brown, Y. (compiler). 1992. "Surficial Geology of the Province of Nova Scotia, Nova Scotia Department of Natural Resources, Minerals and Energy Branch. Map 92-3."

Abbreviations

AMNS	Atlantic Mining NS Inc.
AMO	Abandoned Mine Openings
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
BV	Bureau Veritas
CCME	Canadian Council of Ministers of the Environment
CRM Group	Cultural Resource Management Group
EQS	Environmental Quality Standard
ESA	Environmental Site Assessment
ISQG	Interim Sediment Quality Guideline
LGSP	Low-Grade Stockpile
MDMER	Metals and Diamond Mining Effluent Regulations
mbgs	metres below ground surface
NAG	Non-Acid Generating
NS	Nova Scotia
NSE	Nova Scotia Environment
NSP	Nova Scotia Power
PAG	Potentially Acid Generating
PEL	Probable Effect Limit
PHC	Petroleum Hydrocarbons
PID	Property Identification (numbers)
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
SP	Stockpile
SS	Sediment Sample
SW	Surface Water (sample)
TP	Test Pit
TPH	Total Petroleum Hydrocarbons
TSSP	Top-Soil/Sub-Soil Stockpile
US EPA	United States Environmental Protection Agency

1.0 INTRODUCTION

1.1 GENERAL

At the request of Atlantic Mining NS Inc. (AMNS), Stantec Consulting Ltd. (Stantec) conducted an Extended Phase II Environmental Site Assessment (ESA) of the proposed Beaver Dam Project property (the Site) located in Marinette, Nova Scotia (NS).

The Extended Phase II ESA was completed as part of project feasibility due diligence which is underway as part of an Environmental Assessment for the potential re-development of the gold mine at the Site (the Project). The purpose of the Extended Phase II ESA is to assess soil, sediment, and surface water conditions with respect to historical mining operations including tailings and waste rock disposal areas identified in our Phase I ESA (Stantec 2019a), and to complete further environmental assessment at the Site following our previous Limited Phase II ESA (Stantec 2019b). The Extended Phase II ESA's objectives include the following:

- Address changes in the proposed configuration of the pit and associated mine infrastructure since the initial Phase II ESA screening was completed, and
- Address potential concerns arising from regulators during the Project permitting process.

1.2 SITE DESCRIPTION

1.2.1 Subject Property and Surrounding Land Use

The Site is located in a rural forested area near Marinette, a region of Halifax Regional Municipality, NS. The Site is located 7 km northeast of Route 224 along Beaver Dam Mine Road which is a gravel road located approximately 17 km north-northwest of Sheet Harbour, Nova Scotia. The general Site location is shown on Drawing No. A-1, Appendix A.

The Site consists of portions of several properties owned by Northern Timber Nova Scotia Corp., with Property Identification Nos. (PIDs) including:

- PID 40200990, Grant 13245
- PID 40201014, Grant 15833
- PID 40201022, Grant 13818
- PID 41202359, Grant not listed
- PID 40201071, Grant not listed
- PID 40201006, Grant 14028
- PID 40201030, Grant 9805
- PID 41202334, Grant not listed
- PID 40469405, Grant not listed
- PID 40201048, Grant not listed
- PID 00541656. Grant 10271

- PID 41480039, Grant not listed
- PID 40201063, Grant (portion of) 13245
- PID 41202342, Grant (portion of) 13245
- PID 40091613, Grant not listed
- PID 40200966, Grant 12271
- PID 40200958, Grant 12232

Toward the western end of the proposed development, the property crosses a portion of provincial Crown land. This Crown land property (PID 40219925) is a large parcel that surrounds the main mine development area and portions of the Project boundary cross along the edges of this property.

The proposed mine and operations footprint covers a large lower portion of PID 00541656 and several others to the south, bounded by the Cameron Flowage (part of the Killag River) to the east, Crusher Lake to the west, and the approximate property lines of PID 40201030 and 41202334 to the south.

The locations of the proposed open pit and ancillary mining infrastructure as well as the mine development area are shown on Drawing No. A-1, Appendix A. The proposed open pit partially encompasses the area of historical mine workings and is located immediately south of the Cameron Flowage in the vicinity of the former Austin shaft and northwest of the historical settling pond.

There are no permanent buildings in use on the Site. The site hosts old mine workings, waste rock piles, dam structures, access roads, abandoned cabins and several hunting blinds. The Site is industrial in nature; Stantec is not aware of any plans to change this land use in the foreseeable future.

Surrounding land use is summarized in Table 1.

Table 1 Adjoining Properties – Current Land Use

Direction	Current Land Use	Current Occupant
North	Undeveloped, forested	None
South	Undeveloped, forested	None
East	Undeveloped, forested and lime station on the Killag River	None – the lime station is to the east off the access road near the Killag River (outside the mine footprint)
West	Undeveloped, forested	None

1.2.2 Site Infrastructure and Services

The property is not currently serviced, being in a rural portion of the province. Evidence of historical mining was present during site visits undertaken in 2019 and 2020, including apparent building foundations, waste rock piles, laydown areas, and an old mining excavation. In the centre of the proposed open pit extending to the east is the remains of a historical two-stage settling pond and associated earthen dam from the 1980s. The dam has the remains of a control structure with a discharge to Cameron Flowage, part of the Killag River. The ruins of an old cabin are located north of Crusher Lake in the vicinity of Forge Hill (shown on Drawing No. A-1, Appendix A). To the north of Crusher Lake at least

two abandoned hunting blinds were identified during the site visits. On the northeast corner of Crusher Lake there was a cluster of informal abandoned cottages consisting of four buildings that appear to be in a state of disrepair. (Stantec 2019a)

Based on a review of the Nova Scotia Well Logs Database, there are no potable water wells on the Site (Nova Scotia Environment 2019). The mapping does illustrate numerous drill locations from the various exploration drilling programs that have been conducted on the Site surface. Stantec did identify monitoring well clusters on the Site during the July 2019 site visit (Stantec 2019b). Adjacent to the wells were coils of plastic tubing suggesting that they have been sampled in the past. Since the wells were located in clusters they are likely drilled to different depths. No reports for these wells were provided to Stantec and groundwater data was not reviewed or included in this report.

1.2.3 Topography and Regional Drainage

Based on available topographic maps and the observed site topography, the Site is located in an area of low topographic relief around an elevation of 140 metres (m) with scattered drumlins reaching 160 m. The surfaces of the Site consist of a combination of open wetland, rock piles and woodland. There are a number of boggy and forested areas within the property. (FSSI Consultants (Aust) Pty. Ltd. 2015)

Vegetation consists of spruce, fir, and some hardwood. Logging has been widely carried out more recently including clear cutting in the immediate area of the Project proposed footprint. Constructed or remains of various dams along local water ways, surface mining and excavation of numerous mine shafts/pits are located at the Site (discussed in Section 1.2.3.1, below).

Stormwater is anticipated to drain by infiltration and/or overland flow. Locally, water in the eastern portion of the Site is directed toward an artificial historical settling pond with the remains of a dam which is maintaining the water level in the pond. Overflow from the historical settling pond is directed into the Killag River and Cameron Flowage.

Based on an available topographic map and the observed site topography, regional undisturbed surface drainage (anticipated shallow groundwater flow direction) appears to be to the north toward Crusher Lake, then via an unnamed brook to Mud Pond with eventual outflow into Killag River and Cameron Flowage. It should be noted that the direction of the shallow groundwater flow in limited areas can also be influenced by the presence of underground mine workings and is not necessarily a reflection of regional or local groundwater flow or a replica of the Site or area topography.

1.2.3.1 Abandoned Mine Openings (AMOs)

Based on information provided by McCallum Environmental Ltd. (McCallum), there are seventeen Abandoned Mine Openings (AMOs) in the Beaver Dam Project area. The majority of these AMOs are located in the area of the proposed open pit development with a smaller cluster of AMOs to the west near Forge Hill. During Stantec's site visit, field staff encountered an estimated additional fifteen apparent openings several hundred meters from the proposed open pit area, located north of Crusher Lake and to the south of the proposed open pit in the woods. Given the overgrown nature of the area, it is not

unreasonable that some AMOs were not identified by DNR or others and hence may not have been mapped. Given the age and potential hazards associated with these features, Stantec has not conducted any assessment of them to determine the depth or exact size of these apparent AMOs.

1.2.4 Surficial and Bedrock Geology

The Project property lies largely within the sandstone turbidites and slate: continental rise prism (in places metamorphosed to schist and gneiss) of the Goldenville Formation, with some granitoid in the west (Keppie 2000). The Beaver Dam deposit is hosted in the southern limb of a north-dipping overturned anticline that hosts the vein gold mineralization. Based on available surficial geology maps, the native surficial soils of the Site consist of glacial till (Stea 1992): organic deposits (bogs and swamps), hummocky ground moraine, stony till plain, and silty drumlin.

The referenced geology maps are included in Appendix G, along with drawings showing the bedrock and surficial geology at the Project property (Drawings No. G-1 and G-2).

1.3 PREVIOUS ENVIRONMENTAL REPORTS

Environmental investigations previously conducted at the Site by Stantec and others include the following, which were reviewed by Stantec as part of the Limited Phase II ESA (Stantec 2019b) and this report:

- Report Nova Scotia Department of Mines and Energy on Environmental Assessment of Beaver Dam Exploration, Beaver Dam, Nova Scotia. Prepared for Seabright Resources Inc. by Jacques Whitford (now Stantec), report dated June 27, 1986, File No. M1285. Department of Natural Resources File No. PR 86-005. (Jacques Whitford 1986)
- Appendix N.1 Archaeological Assessment Beaver Dam Mine Site - part of the Beaver Dam Mine Project - Revised Environmental Impact Statement, Marinette, Nova Scotia. Prepared by Cultural Resources Management Group Limited for Conestoga-Rovers & Associates. Dated March 2015, CRM Project No. 2014-0015-01. (CRM 2015)
- Stantec Consulting Ltd., 2019. Draft – Phase I Environmental Site Assessment, Beaver Dam Property, 181 Beaver Dam Mines Rd., Marinette, NS. Prepared for Atlantic Mining NS Corporation. August 6, 2019. (Stantec 2019a)
  - Included in Appendix G.
- Stantec Consulting Ltd., 2019. Draft – Limited Phase II Environmental Site Assessment – Beaver Dam Property, 181 Beaver Dam Mines Rd., Marinette, NS. Prepared for Atlantic Mining NS Corporation. August 23, 2019. (Stantec 2019b)
  - Included in Appendix G.

The Limited Phase II ESA drew the following summarized conclusions (Stantec 2019b):

- Possible tailings were visually observed in the stratigraphy of eight of the 29 test pits excavated as part of field activities completed between July 10 and 11, 2019 within the Project area. Of the twelve test pits located within or adjacent to the proposed open pit area, four had possible tailings: in the vicinity of the Austin shaft, north of the historical settling pond (shown on Drawing No. A-1, Appendix A). Four of the test pits with possible tailings were located north of Crusher Lake near historical mine workings and stamp mill operations. These locations match the suspected sites observed in Lidar data. Note that visual observation of possible tailings is not necessarily indicative of elevated arsenic concentrations at that location.
- Concentrations of arsenic in soil exceeding the applicable NSE Tier 1 EQS were identified in 25 of the 29 test pit locations. The highest concentrations of arsenic are localized in the area north of the Austin shaft and settlement pond area with the Cameron Flowage located directly east. Concentrations of arsenic exceeding the applicable Tier 1 EQS were also identified in areas where waste rock was used to re-grade the site (historical exploration camps south of the Austin shaft), and areas of historical stamp mills such as Crusher Lake and Forge Hill.
- Two test pits were also conducted at the bottom of the historical settling pond near the dam structure (TP19-02 and -03) and samples form these locations exceeded the Tier 1 EQS for arsenic. Six test pits directly south of the proposed pit and downgradient of historical operations between Beaver Dam Mine Road and the Killag River also exceeded the Tier 1 EQS.
- Concentrations of arsenic detected in soil samples collected from test pits TP19-16, -17 and -18, which were located outside the footprint of the proposed open pit and not downgradient of the historical settling pond, did not exceed the Tier 1 EQS and are potentially indicative of background soil concentrations.
- Possible waste rock was visually observed at four of the 29 test pit locations. One of these test pits was located adjacent to the Austin shaft and adjacent mine workings (TP19-01), one was located adjacent to the dam area of the settlement pond bordering the Killag River (TP19-03), and two test pits were located in the identified waste rock near the historical M.E.X. pit (TP19-07 and -08). Tailings and waste rock appear to be located largely within the Project area.
- Concentrations of aluminum and iron exceeding the applicable NSE Tier 1 EQS were identified in all the surface water samples analyzed. Concentrations of chromium only exceeded in a duplicate sample taken at SW19-04 downgradient in the Killag River. Cadmium in three of the four samples exceeded the applicable NSE Tier 1 EQS. The detected concentrations of metals did not exceed the applicable Metals and Diamond Mining Effluent Regulations (MDMER) Authorized Limits in any of the samples.
- Concentrations of arsenic in surface water exceeded in only one sample taken near the dam structure within the historical settling pond (SW19-01), shown on Drawing No. A-7.

1.4 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACTS

Table 2 provides a summary of potential sources of environmental impacts as identified in the Draft Phase I ESA (Stantec 2019a):

Table 2 Potential Sources of Environmental Impacts

Location	Potential Concern
Apparent Tailings	Potential elevated arsenic and mercury levels in tailings.
Waste Rock	Waste rock: potentially arsenic containing and having acid generating potential.

1.5 REGULATORY FRAMEWORK

1.5.1 Provincial Environmental Quality Standards (EQS)

Nova Scotia Environment (NSE) released its *Contaminated Sites Regulations* on July 6, 2013 which provide the requirements for notification of contaminated sites, as well as the basis for determining the appropriate numerical remediation levels, or ongoing site exposure management measures, applicable to a contaminated site (Nova Scotia Environment 2013). The overall regulatory goals for remediation are to manage contamination to reduce related risks to acceptable levels for humans and the environment (i.e., ecology). These goals may be met by a variety of means acceptable to NSE, from cleanup at the conservative generic (Tier 1) level, to cleanup based on site-specific conditions (Tier 2), to long-term exposure management of site contamination through engineered, physical or administrative controls.

Tier 1 Environmental Quality Standards (EQS) are substance generic environmental quality standards that may be used for remediation levels. These standards represent a standardized level of risk for contributing pathways, based on land use and other factors. Use of the Tier 1 EQS for remediation is a conservative and typical application of cleanup standards. The Tier 1 EQS consider human health and ecological effects where applicable.

1.5.1.1 Soil Tier 1 EQS

Analytical results for soil have been compared to the applicable Tier 1 EQS for an industrial site with non-potable groundwater use and coarse-grained soil (standards for coarse-grained soil are more conservative than standards for fine-grained soil). For metals, the Tier 1 EQS for a potable and non-potable site are equivalent.

1.5.1.2 Sediment Tier 1 EQS

Analytical results for sediment have been compared to the Tier 1 EQS as well as to the Canadian Sediment Quality Guidelines, discussed in Section 1.5.2 below. Tier 1 EQS for sediment are largely identical to the Canadian probable effect levels (PEL, discussed in Section 1.5.2 below) with the exception of antimony, iron, manganese, nickel, and strontium, for which Tier 1 EQS exist but federal guidelines do not.

Based on field observations, one sediment sample was also analysed for petroleum hydrocarbons (PHC). Hydrocarbon results were compared to the Tier 1 EQS. No federal guidelines exist for hydrocarbons in sediment.

1.5.1.3 Surface Water Tier 1 EQS

Analytical results for surface water have been compared to the Tier 1 EQS for freshwater and to the Metals and Diamond Mining Effluent Regulations (MDMER), discussed in Section 1.5.3 below.

1.5.2 Canadian Sediment Quality Guidelines

The Canadian Council of Ministers of the Environment (CCME) have developed interim sediment quality guidelines (ISQG) for the protection of aquatic life (CCME 1999). They have also developed or compiled probable effect levels (PEL) above which adverse biological effects are usually or always observed. The PEL is less stringent than the ISQG for all metals.

Analytical results for sediment have been compared to the applicable ISQG and PEL for a freshwater environment. For metals, ISQG and PEL are only available for arsenic, cadmium, chromium, copper, lead, mercury, and zinc.

1.5.3 Metals and Diamond Mining Effluent Regulations (MDMER)

The MDMER (SOR/2002-222) regulates maximum authorized limits of concentrations of selected prescribed deleterious substances in active mine effluent in its Schedule 4, including arsenic, copper, lead, nickel, and zinc, within the monthly mean of samples, composite samples, and grab samples (SOR/2002-222 2020).

For comparison to a potential future discharge point(s), analytical results for surface water have been compared to the applicable MDMER maximum authorized concentrations for new or re-opening mines on or after June 1, 2021 (Table 1, Schedule 4 of the regulation) (SOR/2002-222 2020).

1.5.4 Summary of Regulatory Framework

Table 3 provides a summary of applicable standards and guidelines considered in this assessment.

Table 3 Summary of Regulatory Framework

Media	Metals
Soil	Tier 1 EQS for Soil (coarse-grained soil, industrial land use, potable or non-potable site)
Sediment	Tier 1 EQS for Sediment (freshwater)
	CCME ISQG for the Protection of Aquatic Life (freshwater)
	CCME PEL for the Protection of Aquatic Life (freshwater)
Surface water	Tier 1 EQS for Water (freshwater)
	MDMER Maximum Authorized Concentrations

1.6 OBJECTIVES

The objective of the Extended Phase II ESA is to complete further environmental assessment at the Site following our initial Limited Phase II ESA (Stantec 2019b) via assessment of soil, surface water and sediment conditions. Environmental assessment is with respect to historical mining operations including tailings and waste rock disposal areas identified in our Phase I ESA (Stantec 2019a).

1.6.1 Scope of Work

The scope of this Extended Phase II ESA consists of the following:

- Collection of soil samples to delineate arsenic previously detected in 2019 in soil in the area of the proposed open pit footprint to better define the areas of historical tailings that may be disturbed during redevelopment or will require long-term management.
  - The proposed scope of work initially included delineation of mercury as well as arsenic; however, mercury has not been identified at the Site at levels exceeding Tier 1 EQS as discussed in Section 3.3.1 below.
- Collection of soil samples to conduct the initial screening of the revised mine infrastructure areas, including the various stockpiles and crusher pad not previously assessed in the initial Phase II ESA screening (Stantec 2019b).
- Collection of sediment and surface water samples from Crusher Lake, Cameron Flowage and the on-site historical settling pond from the previous mine operations, within the proposed development area of the Site, for trace metals analysis by Bureau Veritas (BV) laboratory.
- Establishment of site-specific sediment and soil quality criteria based on results collected in 2019 and during the current program in comparison to publicly available “baseline” information collected near the Project area.
- Preparation of a final report consolidating the initial Phase II ESA data and new screening and delineation data.

2.0 FIELD INVESTIGATION

2.1 RATIONALE

2.1.1 Soil Sampling Program Rationale

Soil sample locations were selected with the following rationale:

- Locations were chosen to further delineate the arsenic previously detected in 2019 in the area of the proposed pit. Stantec used a grid to assess areas around and between areas that Stantec considered to have been impacted with arsenic based on 2019 soil analytical results and field observations, and to screen newly identified areas.
- Locations were also chosen to screen the revised proposed mine infrastructure areas.

Soil sample locations were modified in the field based on access and observations (e.g., thick vegetation, observed waste rock). Soil sample locations are shown on Drawing No. A-2, Appendix A.

2.1.2 Sediment and Surface Water Sampling Program Rationale

Sediment samples were collected from water bodies with the potential to have been impacted by historical mining operations: Crusher Lake, Cameron Flowage, and the on-site historical settling pond. Selected surface water samples were also collected for comparison of chemical components.

Based on field observations (strong hydrocarbon odour and location within the historical settling pond area), one location (SS20-03B, shown on Drawing No. A-3) was sampled and analysed for hydrocarbons (Table C-3, Appendix C).

2.2 METHODOLOGY

Stantec conducted field activities as part of the Extended Phase II ESA between July 20 and 28, 2020. Stantec conducted a visual assessment of the Site, excavated and collected soil samples from 65 test pits, collected sediment samples at 13 locations, and collected surface water samples at five locations. Test pit, sediment, and surface water sample locations are shown on Drawing No. A-2 to A-4, respectively, in Appendix A.

All samples were collected following strict Stantec sampling procedures. Samples were uniquely labelled other than two samples which were mistakenly both labeled TP20-29 on chain of custody forms; the sample collected on July 20 within the proposed road area was renamed TP20-29 (1) and the sample collected on July 23 within the proposed PAG (potentially acid generating) Stockpile area was renamed TP20-29 (2) within this report. Sample control was maintained through use of chain of custody forms. All samples were collected in laboratory-supplied containers and preserved in insulated coolers. Appropriate sampling quality assurance and quality control (QA/QC) procedures were adhered to at all times.

2.2.1 Soil Sampling

A total of 65 test pits (i.e., TP20-01 to TP20-65, including both TP20-29 (1) and TP20-29 (2), and TP20-100 to TP20-104; excluding TP20-24, TP20-28, TP20-42, TP20-56, and TP20-103 which could not be excavated due to either access or stratigraphy) were excavated between July 20 and 28, 2020. Test pit locations are shown on Drawing No. A-2, Appendix A. The test pits were manually excavated by Stantec personnel using a hand-held shovel and metal bar or a Dutch auger. Stantec personnel monitored the test pit excavation, maintained detailed logs and photographic records of the subsurface conditions encountered, and obtained representative soil samples. Test pit logs are included in Appendix B.

The test pits were advanced to depths generally ranging from 0.2 metres below ground surface (mbgs) to 0.8 mbgs, at which point refusal of the hand-held shovel, bar or a Dutch auger was encountered. TP20-05 and TP20-15 were advanced to between 0.10 and 0.19 mbgs due to gravel, cobbles, or boulders in the area. Representative bulk soil samples were collected from the test pits. One soil sample was collected from each test pit apart from TP20-22 and TP20-101, where two soil samples were collected based on an observed soil horizon change; no samples were collected from TP20-11 due to gravel/cobbles.

The soil samples were examined in the field for evidence of impacts (visual or olfactory), placed in new laboratory-supplied glass jars, placed on ice, and submitted to BV. Based on site observations and past results, the soil samples were submitted for laboratory analysis of available (acid extractable) metals.

2.2.2 Sediment Sampling

Sediment sample locations were limited: the bottoms of Site water bodies were often too rocky, vegetated, or loose to permit sample collection. A total of 13 sediment samples plus one field duplicate (i.e., samples at SS20-01 to SS20-16, excluding SS20-10, -12, and -13 where samples could not be collected) were collected between July 28 and 29, 2020. Sediment sample descriptions are included in Appendix B.

Sediment samples were collected at depths ranging from 0.3 to 1.5 m below the water body floor, at which point refusal of the hand-held sampling equipment was generally encountered, and/or the water depth was too great to continue with the hand-held sampling equipment. Several sample locations were noted to be open at depth (i.e., refusal was not encountered): SS20-01, SS20-02B, and SS20-05 (within the historical settling pond). The majority of samples were collected using a hand-held shovel, Dutch auger, or sludge judge from either a boat or the shoreline. A Petit Ponar was also used in deep water locations but proved ineffective in collecting a proper sediment sample due to the presence of a thick organic layer inhibiting the penetration of the Ponar grab in the underlying substrate.

The sediment samples were examined in the field for evidence of impacts (visual or olfactory), placed in new laboratory-supplied glass jars, placed on ice, and submitted to BV. Based on site observations and past results in other media, the sediment samples were submitted for laboratory analysis of available (acid extractable) metals.

2.2.3 Surface Water Sampling

A total of five surface water samples were collected (i.e., SW20-01 to SW20-05). SW20-01 and SW20-02 were collected within Cameron Flowage, SW20-03 within the Killag River to the northwest of Cameron Flowage, SW20-04 within the Killag River to the east of Cameron Flowage, and SW20-05 within Crusher Lake.

2.3 LABORATORY ANALYSES

Sixty-seven soil samples plus six field duplicates were submitted to BV for analysis of available (acid-extractable) metals. Thirteen sediment samples plus one field duplicate were submitted for analysis of available (acid-extractable) metals, and one for petroleum hydrocarbons. Five surface water samples were submitted for analysis of available (acid-extractable) metals.

Analytical results are presented in Appendix C. The laboratory analysis schedule completed as part of this investigation is presented in Table 4.

Table 4 2020 Laboratory Analysis Schedule

Parameter	Sample Media		
	Soil	Sediment	Surface Water
Metals	67 + 6 Fld-Dup	13 + 1 Fld-Dup	5
Petroleum Hydrocarbons	0	1	0

Notes:
The methodologies utilized by BV in analysis of the soil, sediment, and surface water samples are presented on the analytical report in Appendix D.
Fld-Dup = field duplicate QA/QC sample.

3.0 RESULTS

3.1 GENERAL OBSERVATIONS

The Site is largely forested. The area of the proposed open pit appears to be largely reworked ground surrounding a historical settling pond. Suspected tailings were observed within the proposed open pit area near the historical settling pond, north of Crusher Lake between the lake and the proposed road, and to the north of the proposed road near the historical Mill Shaft Pit area (proposed topsoil/sub-soil stockpile [TSSP] area). Several trenches and pits with nearby suspected waste rock were located within the proposed pit area, to the south and east of the pit area, north of Crusher Lake between the lake and the proposed road, and to the north of the proposed road near the historical Mill Shaft Pit area (proposed TSSP area). These trenches and pits are suspected to be historical mine workings.

General observations are recorded in photographs in Appendix E, including views of historical mine workings, tailings, waste rock, and water bodies.

3.2 SUBSURFACE CONDITIONS

3.2.1 Stratigraphy

3.2.1.1 Test Pit Soil

Test pit logs are included in Appendix B.

Soil stratigraphy is discussed in terms of the test pits' classification as impacted or non-impacted by historical mining activities as discussed and summarized in Section 4.1.1, below.

Thirty-six of the 65 test pits advanced during the Extended Phase II ESA work in 2020 are classified as non-impacted by historical tailings or waste rock. The stratigraphy at these non-impacted locations generally consists of:

- surface
- 0.00 to 0.25 m of organic material or rootmat
- 0.1 to 0.6 m of likely native soil, type varying with location:
  - most widespread: grey, brown, or reddish-brown silty sand, often with some gravel and/or cobbles, sometimes with roots. TP20-29 (2), -31, -35, -43, -62, and -64 (scattered throughout the Site) contain a grey to brown grey fine silt layer.
  - TP20-34 and -51: dark brown silt with gravel
  - TP20-46 and -47: grey silt with organics
  - TP20-48: reddish brown silty clay
- refusal at 0.2 to 0.8 mbgs

Fifteen of the 65 test pits are classified as impacted by historical tailings. The stratigraphy at these impacted locations was generally like the unimpacted locations with the addition of a layer of up to 0.65 m of distinct grey sand, gravelly sand, or silt (suspected tailings).

Fourteen of the 65 test pits are classified as impacted by historical waste rock. The stratigraphy at these impacted locations was generally like the unimpacted locations with the addition of a layer of up to 0.62 m of gravel and/or cobbles, often infilled with brown or orange-brown sand (suspected waste rock).

3.2.1.2 Sediment

Sediment samples were collected under water ranging from 0.3 to 1.8 m deep.

Stantec field staff observed possible tailings within two of 16 sediment investigation locations: SS20-03B (within the historical settling pond) and SS20-09 (within Crusher Lake). At these locations, sediment generally consisted of suspected tailings (grey sand, gravelly sand, or silt) underlying 0.1 to 0.2 m of organics.

Stantec field staff did not observe possible tailings within 14 of 16 sediment investigation locations. Of these samples:

- Nine (SS20-01, -02B, -04, and -5 within the historical settling pond, and SS20-10, -11, -12, -13, and -16 within the middle or mouth of Crusher Lake) generally consisted of organic material with occasional fine sediments or sandy silt.
- Four (SS20-07 and -08 within the Killag River, and SS20-14 and -15 near the shoreline of Crusher Lake) consisted of gravelly sand, gravel, cobbles, and/or boulders, with or without organic material.
- SS20-06 (within Cameron Flowage) consisted of 0.15 m of organics and cobbles overlying 0.20 m of grey-brown sand and gravel.

Sediment descriptions are included in Appendix B.

3.2.2 Groundwater Observations

The majority of the test pits were dry or moist. Water was observed in TP20-11, -18, -20, -39, -40, -62, -64, and -102, generally near Crusher Lake, Cameron Flowage, or other water bodies in the northern half of the Site. Water was not observed in test pits within the proposed open pit area or in the southern half of the Site.

3.2.3 Free Phase Petroleum Hydrocarbons

Free liquid phase petroleum hydrocarbons (i.e., free product) were not observed on soil in the test pits or on soil samples collected during the investigation.

A strong petroleum hydrocarbon odour was noted within the sediment at SS20-03B, where a sample was collected for analysis of petroleum hydrocarbon parameters. Results are presented in Section 3.3.2, below.

3.3 ANALYTICAL RESULTS

3.3.1 Soil Analytical Results

Laboratory analysis for available (acid extractable) metals was conducted on 67 soil samples originating from 65 test pits, plus six field duplicate samples, collected in 2020. Results from 29 soil samples originating from 29 test pits collected and previously reported as part of the Limited Phase II ESA activities (Stantec 2019b) are also included in the data set and discussed throughout this report.[1] Results of the laboratory analysis of soil samples are presented on Drawing No. A-5, Appendix A and Table C-1, Appendix C and summarized in Table 5 below:

Table 5 Summary of Soil Contamination (2019-2020)

Standard Exceedances	Tier 1 EQS	Exceeding (Samples)	Exceeding (Test Pits)
Arsenic	31 mg/kg	73 of 96 samples*	72 of 94 test pits*
Other Metals	Various	None	None

Notes:
Numbers of exceedances do not include field duplicate samples.
*There are more soil samples than test pit locations as two soil samples, rather than one, were collected from two of the test pits.

Levels of arsenic ranged from non-detected to 3,900 mg/kg.

Lead and mercury have been associated with historical mining activities in Nova Scotia, including at the Fifteen Mile Stream site as reported by Stantec (Stantec 2020a). Levels of lead and mercury in soil at the Project site were relatively elevated but did not exceed applicable Tier 1 EQS. The maximum identified lead concentration was 200 mg/kg versus a Tier 1 EQS of 740 mg/kg, and the maximum identified mercury concentration was 40 mg/kg versus a Tier 1 EQS of 99 mg/kg.

3.3.2 Sediment Analytical Results

Laboratory analysis for available (acid extractable) metals was conducted on 13 sediment samples plus one field duplicate sample. Results of the laboratory analysis of sediment samples are presented in Drawing No. A-6, Appendix A and Table C-2, Appendix C. Based on field observations (strong petroleum hydrocarbon odour), the sediment sample SS20-03B was also analysed for petroleum hydrocarbons (PHC): benzene, toluene, ethylbenzene, and total xylenes (BTEX), and modified total petroleum hydrocarbons (TPH), with results presented on Table C-3, Appendix C.

[1] Samples collected during Limited Phase II ESA activities have been renamed to indicate the year of collection more clearly as shown on Table C-1, Appendix C. For example, the sample previously reported as SA1 (collected from a test pit in 2019) has been renamed to TP19-01 and referred to as such throughout this report.

Levels of arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, strontium, and zinc exceeded guidelines at one or more sample locations. Results for other metals were below criteria where available (antimony and nickel below Tier 1 EQS only; no other ISQG or PEL available). These results are summarized in Table 6:

Table 6 Summary of Sediment Contamination (2020)

Criteria Exceedances	Criteria (mg/kg)			Exceeds ISQG	Exceeds PEL	Exceeds Tier 1 EQS
	ISQG	PEL	Tier 1 EQS			
Arsenic	5.90	17.00	17	10 of 13	9 of 13	9 of 13
Cadmium	0.60	3.50	3.5	3 of 13	1 of 13	1 of 13
Chromium	37.30	90.00	90	2 of 13	0 of 13	0 of 13
Copper	35.70	197.00	197	3 of 13	0 of 13	0 of 13
Iron	-	-	43,766	-	-	2 of 13
Lead	35.00	91.30	91.3	4 of 13	2 of 13	2 of 13
Manganese	-	-	1,100	-	-	1 of 13
Mercury	0.17	0.486	0.486	4 of 13	2 of 13	2 of 13
Selenium	-	-	2	-	-	1 of 13
Strontium	-	-	1	-	-	11 of 13
Zinc	123.00	315.00	315	3 of 13	1 of 13	1 of 13
Antimony and nickel	-	-	25 and 75	-	-	0 of 13
Modified TPH	-	-	25 (fuel oil) 43 (lube oil)	-	-	1 of 1
BTEX	-	-	1.2, 1.4, 1.2, 1.3	-	-	0 of 1

Notes:

[1] Strontium exceedances of Tier 1 EQS exclude concentrations below the laboratory's reportable detection limits (RDL) where the RDL exceeds the EQS.

Numbers of exceedances do not include field duplicate samples.

Arsenic in sediment ranged from 3.1 mg/kg to 2,800 mg/kg, with the highest concentration at SS20-07, located upstream within the Killag River approximately 800 m north-northwest of the proposed open pit, which also had cadmium, iron, lead, and manganese above applicable criteria. Arsenic exceeded ISQG at all locations other than SS20-09, -15, and -16, which were collected at the east end of Crusher Lake.

Sample SS20-03B contained modified TPH at a concentration of 2,800 mg/kg with a hydrocarbon resemblance to the weathered fuel oil and lube oil fractions. This sample location also included arsenic, cadmium, copper, lead, strontium, and zinc above applicable criteria, including the highest observed levels of cadmium, lead, strontium, and zinc of all 2020 sediment samples.

3.3.3 Surface Water Analytical Results

Laboratory analysis for total metals was conducted on five surface water samples collected in 2020. Results from four surface water samples collected and previously reported as part of the Limited Phase II ESA activities (Stantec 2019b) are also included in the data set and discussed throughout this report.[2] Results of the laboratory analysis of surface water samples are presented in Drawing No. A-7, Appendix A and Table C-4, Appendix C.

Levels of aluminum, arsenic, cadmium, chromium, and iron exceeded Tier 1 EQS at one or more sample locations. Results for other metals were below criteria where available. Results did not exceed MDMER Maximum Authorized Concentrations. These results are summarized in Table 7:

Table 7 Summary of Surface Water Contamination (2019-2020)

Criteria Exceedances	Criteria		Exceeds Tier 1 EQS	Exceeds MDMER*
	Tier 1 EQS	MDMER[1]		
Aluminum	5	-	9 of 9	0 of 9
Arsenic	5.0	200	2 of 9	0 of 9
Cadmium	0.010	-	7 of 9	0 of 9
Chromium	1.0	-	1 of 9	0 of 9
Iron	300	-	9 of 9	0 of 9
Other metals	Various	Various	0 of 9	0 of 9

Notes:
*The MDMER Maximum Authorized Concentrations applicable to grab samples (for new or reopening mines on or after June 1, 2021) are included in this table. Other MDMER applicable to monthly mean of samples or composite samples are included in Table C-4, Appendix C.
Numbers of exceedances do not include field duplicate samples.

Arsenic in surface water ranged from below detection limits to 45 µg/L, with the Tier 1 exceedances of 32 and 45 µg/L located at SW19-01 and SW20-02, both located at or near the outflow of the historical settling pond.

3.3.4 Field Duplicate QA/QC

Where field duplicates were collected (at six locations for soil and one location for sediment), Stantec calculated relative percent differences (RPDs) between the chemical concentrations detected in the samples and their field duplicates. Tabulated RPDs for soil and sediment are included in Table C-5 and C-6, respectively, in Appendix C.

[2] Samples collected during Limited Phase II ESA activities have been renamed to indicate the year of collection more clearly as shown on Table D-4, Appendix D. For example, the sample previously reported as SW1 (collected in 2019) has been renamed to SW19-01 and referred to as such throughout this report.

Soil sample RPDs were under 60%, the acceptable limit for soil blind field duplicates (Bureau Veritas 2020).

Sediment RPDs were also under 60%. BV has not recommended an acceptable limit for sediment blind field duplicates.

These results do not indicate quality issues which would affect Stantec's reliance upon the analytical data.

3.3.5 Summary of Exceedances

The Extended Phase II ESA identified concentrations of arsenic in soil, petroleum hydrocarbons in sediment, and various metals in sediment and surface water exceeding the applicable standards and/or guidelines. The distributions of these contaminants are shown on Drawing Nos. A-5 to A-7 in Appendix A. Discussion of these exceedances is included in Section 4.0, below.

4.0 DISCUSSION

4.1 SOIL CONTAMINATION

4.1.1 Impact Classification

Based on field observations, including visible tailings within test pits and their proximity to Site features such as historical mining infrastructure/features (i.e., trenches, waste rock piles, stamp mill foundations, etc.), Stantec classified the test pit locations from both 2019 and 2020 as either non-impacted or impacted by historical mining activities. Of the impacted locations, Stantec further classified them as likely impacted by historical mine tailings or by mine waste rock. This impact classification assisted Stantec in our assessment of background levels and delineation, discussed below.

Soil impact classifications are highlighted on Table C-1, Appendix C and summarized in Table 8:

Table 8 Summary of Soil Impact Classification

Impact Classification at Proposed Mine Infrastructure Areas Based on Field Identification	Non-Impacted Test Pits	Impacted Test Pits	
		Tailings	Waste Rock
Crusher pad	2 of 2	0 of 2	0 of 2
LG (low grade) stockpiles	2 of 2	0 of 2	0 of 2
NAG (non-acid generating) stockpiles	4 of 4	0 of 4	0 of 4
Open pit	4 of 23*	6 of 23† [764]	13 of 23‡ [346]
Organic material stockpiles	6 of 6	0 of 6	0 of 6
PAG (potentially acid generating) stockpiles	2 of 2	0 of 2	0 of 2
Roadways and water management ditches	6 of 9	1 of 9 [230]	2 of 9 [125]
Settling pond	3 of 3	0 of 3	0 of 3
Till stockpiles	6 of 7	1 of 7 [130]	0 of 7
TSSPs (top-soil/sub-soil stockpiles)	4 of 6	1 of 6 [2,800]	1 of 6 [44]
Areas outside of proposed infrastructure	12 of 31	15 of 31 [294]	4 of 23 [104]

Notes:

[ ] The value in brackets represents the mean arsenic concentration (mg/kg) in the soil samples within this proposed mine infrastructure area and impact classification.

* Non-impacted test pits within the proposed open pit were either on the extreme northern edge of the footprint (TP19-10), observed to be composed of natural soil deposits in the field (TP20-34, TP20-35, and TP20-58) and/or contained low concentrations of arsenic (TP20-58).

† Tailings-impacted test pits within the proposed open pit are largely near the central historical settling pond. This includes the highest identified concentration of 3,900 mg/kg at TP19-28.

‡ Waste rock-impacted test pits were identified throughout the re-worked area composing the majority of the proposed open pit.

Sample photographs of observed suspected tailings and waste rock are included below, as well as in the photolog in Appendix E.

Photograph A **Suspected Tailings from TP20-63**

Photograph B **Suspected Waste Rock at Surface of TP20-27**

4.1.2 Background Levels

Some samples from non-impacted areas of the Site include arsenic concentrations higher than the Tier 1 EQS. Arsenic concentrations within non-impacted soil samples represent potential data on background levels in the Site area soil (i.e., arsenic in soil related to geology and not to historical mining activities).

Table 9 presents statistical metrics calculated using the non-impacted soil concentrations, compared to the Tier 1 EQS. Statistical calculations, including distribution and outlier testing, were conducted using the United States Environmental Protection Agency's (US EPA) ProUCL statistics software package for environmental applications (United States Environmental Protection Agency 2016). Detailed methodology on statistical methods used, including distribution and outlier testing, is included in Appendix F.

Table 9 Statistics from Background Non-Impacted Data Set

Concentration (mg/kg)	Tier 1 EQS	Maximum	Mean	Median	75th Percentile	95th Percentile
Arsenic	31	270	75.34	43.5	112.5	228.0

Arsenic levels below the 95th percentile value (228 mg/kg) of the background non-impacted data set were considered to represent arsenic not related to historical mining activities. Delineation based on this value, as well as on field observations, is shown on Drawing No. A-5, Appendix A.

4.1.3 Contamination and Delineation Near Proposed Mine Infrastructure

Impacts above the calculated background value, considered to represent arsenic related to historical mining activities, were identified within the proposed open pit and to its east at the east end of the historical settling pond, as well as in the area of the proposed TSSPs to the north and northwest of the proposed open pit, and intersecting proposed roadways and water management ditches.

This level of impacted soil was also identified within an area spanning the proposed till stockpile and organic material stockpile; however, despite its high levels of arsenic which could affect soil management in this area, soil in this area was field-identified as non-impacted and may represent naturally elevated levels.

This level of impacted soil was also identified around the stream north of the suspected tailings at Crusher Lake (no proposed mine infrastructure in this area).

Proposed infrastructure in other areas may disturb soil or sediment with arsenic concentrations that naturally exceed the guidelines. This will be an important factor during construction for the management of soil and for the disturbance of sediments that may be mobilized on or off-site.

Historical mining-related arsenic contamination in soil identified during the Limited Phase II ESA and Extended Phase II ESA is horizontally delineated other than to the northeast of the proposed open pit near the Cameron Flowage, as shown by dashed lines on Drawing No. A-5, Appendix A.

Identified contamination is not vertically delineated given refusal of hand-held tools during sampling events. Bedrock may limit vertical soil contamination. Stantec has previously reviewed reports on historical Nova Scotia gold mines identifying tailings several metres thick.

4.2 SEDIMENT AND SURFACE WATER CONTAMINATION

Contamination consisting of arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, strontium, zinc, and modified TPH is present in sediments as shown on Drawing No. A-6, Appendix A. Sediment contamination is un-delineated horizontally and vertically.

Sediment sample locations are either located within the footprints of proposed Project infrastructure, or within the general Project area but outside of specific proposed infrastructure areas. Sediment contamination can be divided into five sub-categories:

- Within proposed Project infrastructure footprints (5 samples in area of proposed open pit):
  - Historical settling pond (SS20-01, -02B, -03B, -04, and -05): Arsenic levels range from 110 to 570 mg/kg. Other metals contamination: all identified exceeding substances other than iron and manganese. Modified TPH (weathered fuel and lube oil hydrocarbon fractions) also exceeded Tier 1 EQS here, at SS20-03B.

- Outside of proposed Project infrastructure footprints (8 samples):
  - Central Crusher Lake (SS20-11 and -14): Arsenic levels range from 7.1 to 65 mg/kg. Other metals contamination: selenium, mercury, strontium.
  - Eastern Crusher Lake near stream outflow (SS20-09, -15, and -16): Arsenic levels are below ISQG and PEL, and there is no other metals contamination other than strontium.
  - Eastern Killag River/Cameron Flowage (SS20-06 and -08): Arsenic levels range from 38 to 42 mg/kg. Other metals contamination: cadmium, iron, strontium, and zinc.
  - Northwestern Killag River (SS20-07): Arsenic level is 2,800 mg/kg. Other metals contamination: cadmium, iron, lead, manganese.

The sediment data collected to date suggests widespread arsenic contamination in the Site area mainly due to historical gold mining activities and from local geology, with relatively low levels of arsenic and other metals within Crusher Lake, consistently high levels within the historical settling pond, and the highest levels along the Killag River to the northwest.

The sediment data set is limited and would benefit from further sampling events. Stantec understands that confirmatory sediment sampling will be undertaken during Project construction as described in the Beaver Dam Historical Tailings & Waste Rock Management Plan (Draft) (Stantec 2020b).

Surface water data shows consistent levels of aluminum, cadmium, and iron throughout Site water bodies. Arsenic is elevated in surface water at SW19-01 and SW20-02, both located at or near the outflow of the settling pond.

4.2.1 Background Levels

Sufficient sediment and surface water samples to establish a background data set have not been collected at the Site. Therefore, establishment of a background level for metals in sediment via statistical methods has not been undertaken as part of this assessment.

It is unclear whether the current sediment data set at the Site captures representative background levels of metals: SS20-07, the furthest upstream sample, contains the highest observed level of arsenic. Arsenic generally appears present at elevated levels in sediments at the Site and surrounding areas.

Surface water data shows consistent levels of aluminum, cadmium, and iron throughout Site water bodies, likely representing background levels of these substances.

5.0 CONCLUSIONS

Based on the information gathered and on observations made during this assessment and the Limited Phase II ESA (Stantec 2019b), Stantec provides the following conclusions related to potential environmental contamination associated with historical gold mining operations:

- Concentrations of arsenic in soil exceeding the applicable NSE Tier 1 EQS were identified in 72 of the 95 test pit locations. Some of these locations are considered non-impacted and are potentially indicative of background soil concentrations.
- Twenty-nine of the 65 test pits advanced during the Extended Phase II ESA work in 2020 are classified as likely impacted by historical tailings or waste rock based on field observations, arsenic levels, and proximity to historical site features.
- Arsenic in soil at levels considered to represented impact from historical mining operations intersects with areas of proposed Project infrastructure, including the proposed open pit.
- Concentrations of arsenic in sediment exceeding the applicable ISQG were identified in 10 of 13 sample locations; nine of those locations also had concentrations exceeding the Tier 1 EQS and PEL. Concentrations of cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, strontium, and/or zinc in sediment exceeded guidelines at 12 of 13 sample locations. One sediment sample was analysed for PHC based on hydrocarbon odour, and modified TPH exceeded the applicable Tier 1 EQS. Sediment sample locations were restricted to areas of Crusher Lake, the Killag River, and the historical settling pond.
- Arsenic, cadmium, chromium, copper, lead, mercury, selenium, strontium, zinc, and PHC in sediment within the historical settling pond intersects with proposed Project infrastructure (the proposed open pit area). A management plan for these sediments is described in the Beaver Dam Historical Tailings & Waste Rock Management Plan (Draft) (Stantec 2020b).
- Concentrations of arsenic in surface water exceeding the Tier 1 EQS were identified in two of nine sampling locations. Concentrations of aluminum, cadmium, chromium, and/or iron exceeded guidelines at all sampling locations and may represent background conditions.

6.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

Closure
March 8, 2021

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Gillian Manley, P.Eng., and reviewed by Eric Arseneau, MES, Don Carey, M.Sc., P.Eng., and Patrick Turner, B.Sc., P.Eng.

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Technical Lead – Site Investigation
Environmental Services

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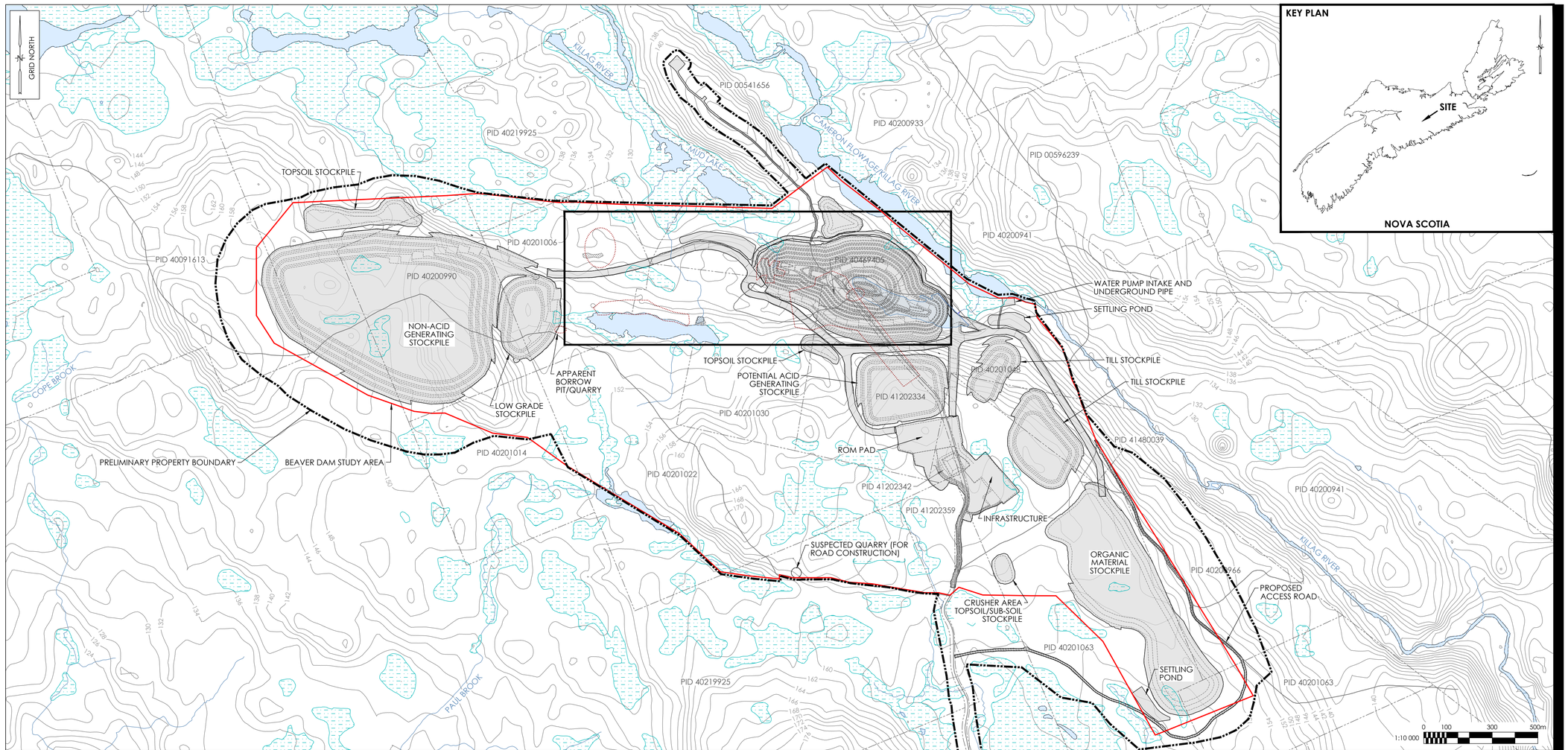
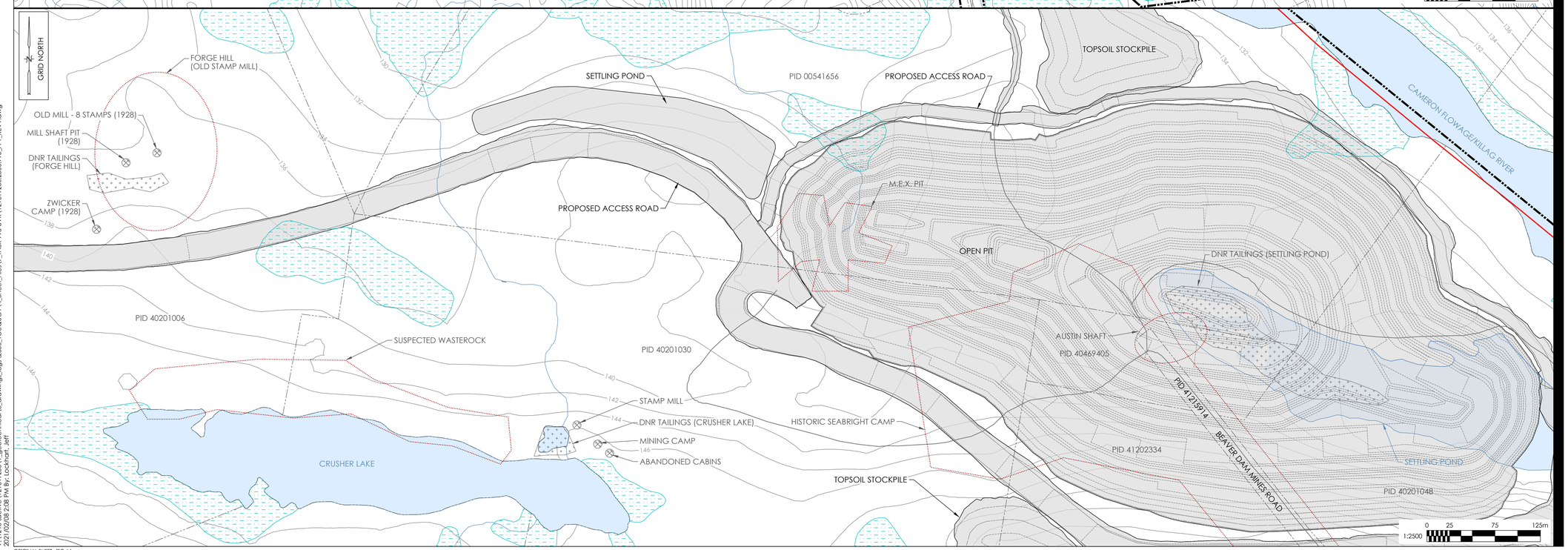
APPENDIX A

Drawings

Drawing No. A - 1 - Project Location
Drawing No. A - 2 - Soil Sample Locations (2019 and 2020)
Drawing No. A - 3 - Sediment Sample Locations (2020)
Drawing No. A - 4 - Surface Water Sample Locations (2019 and 2020)
Drawing No. A - 5 - Arsenic Concentrations Compared to NSE Tier 1 EQS (Industrial Land Use) and Potential Extent of Arsenic in Soil Related to Historical Mining Operations
Drawing No. A - 6 - Metals and PHC Concentrations in Sediment Compared to NSE Tier 1 EQS and Canadian Sediment Quality Guidelines
Drawing No. A - 7 - Metals Concentrations in Surface Water Compared to NSE Tier 1 EQS





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Legend

- BEAVER DAM STUDY AREA
- TOPOGRAPHIC CONTOUR (2m INTERVAL)
- PROPERTY BOUNDARY
- PRELIMINARY PROPERTY BOUNDARY
- EXISTING ROAD
- WATERCOURSE
- WETLAND
- WATERBODY
- PROPOSED MINING INFRASTRUCTURE
- REPORTED TAILINGS - DNR
- HISTORIC MINING OPERATIONS AREA
- HISTORICAL MINING FEATURE LOCATION

Notes

1. DATA SOURCES: GOVERNMENT OF CANADA, GOVERNMENT OF NOVA SCOTIA, McCALLUM AND ATLANTIC MINING NS INC., AUSENCO (DRAWING No. 105227-0000-G-101, REV D, 07/DEC/2020).
2. LOCATIONS OF HISTORICAL MINING FEATURES ARE APPROXIMATE.

Revision		By	Appd.	YY.MM.DD
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File Name: 121619250.2500.995_A-1_REV1	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	JL	EA	GM	21.02.08

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Client/Project

ATLANTIC MINING NS INC.

BEAVER DAM PROJECT

HALIFAX COUNTY, NS

Title

PROJECT LOCATION

Project No.	Scale	
121619250	AS SHOWN	
Drawing No.	Sheet	Revision
A-1	1 of 7	1

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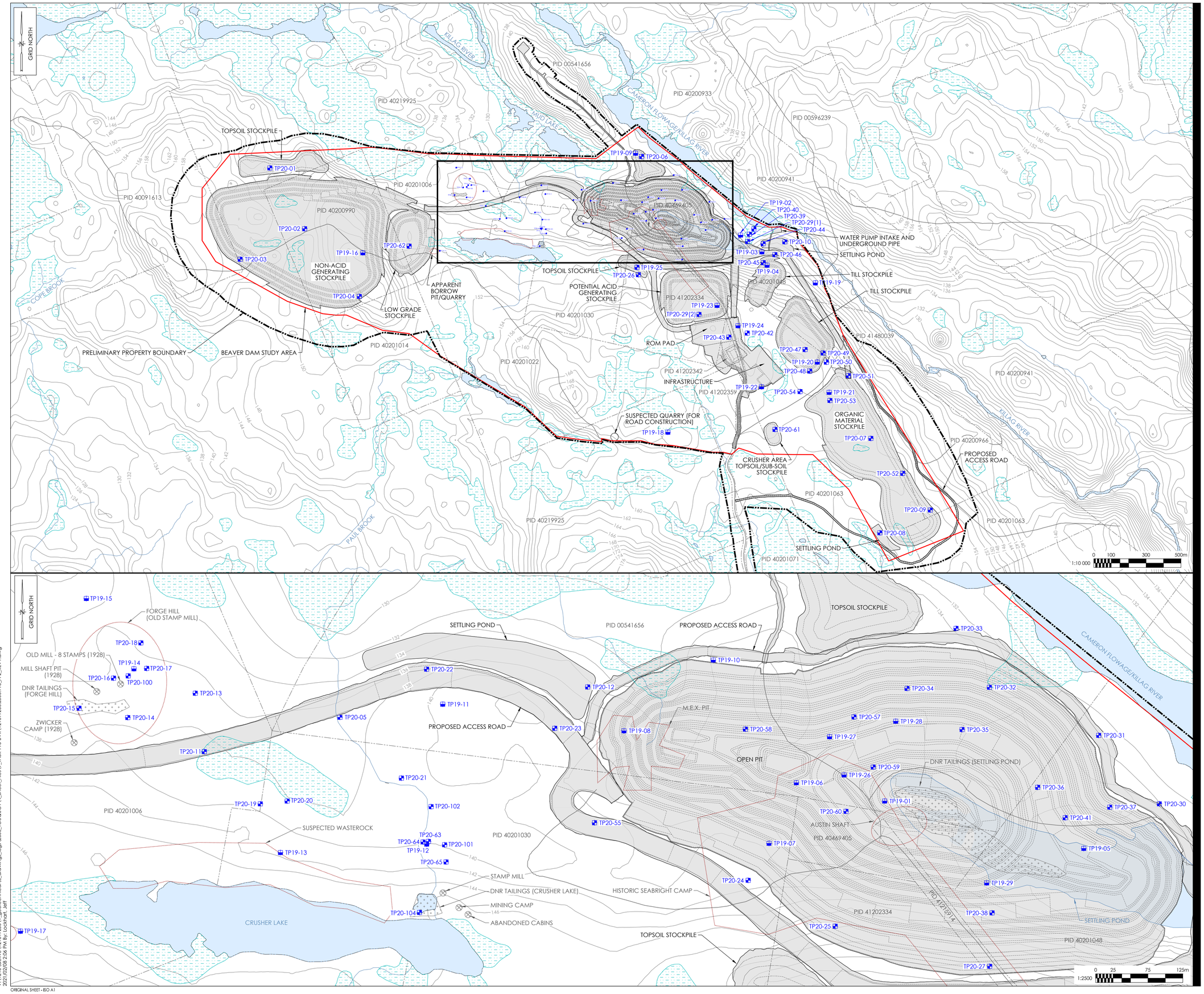

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- REPORTED TAILINGS - DNR
- HISTORIC MINING OPERATIONS AREA
- HISTORICAL MINING FEATURE LOCATION
- TEST PIT LOCATION (2019)
- TEST PIT LOCATION (2020)

Notes

1. DATA SOURCES: GOVERNMENT OF CANADA, GOVERNMENT OF NOVA SCOTIA, McCALLUM AND ATLANTIC MINING NS INC., AUSENCO (DRAWING No. 105227-0000-G-101, REV D, 07/DEC2020).
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HALIFAX COUNTY, NS

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SOIL SAMPLE LOCATIONS (2019 AND 2020)

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Drawing No.	Sheet	Revision
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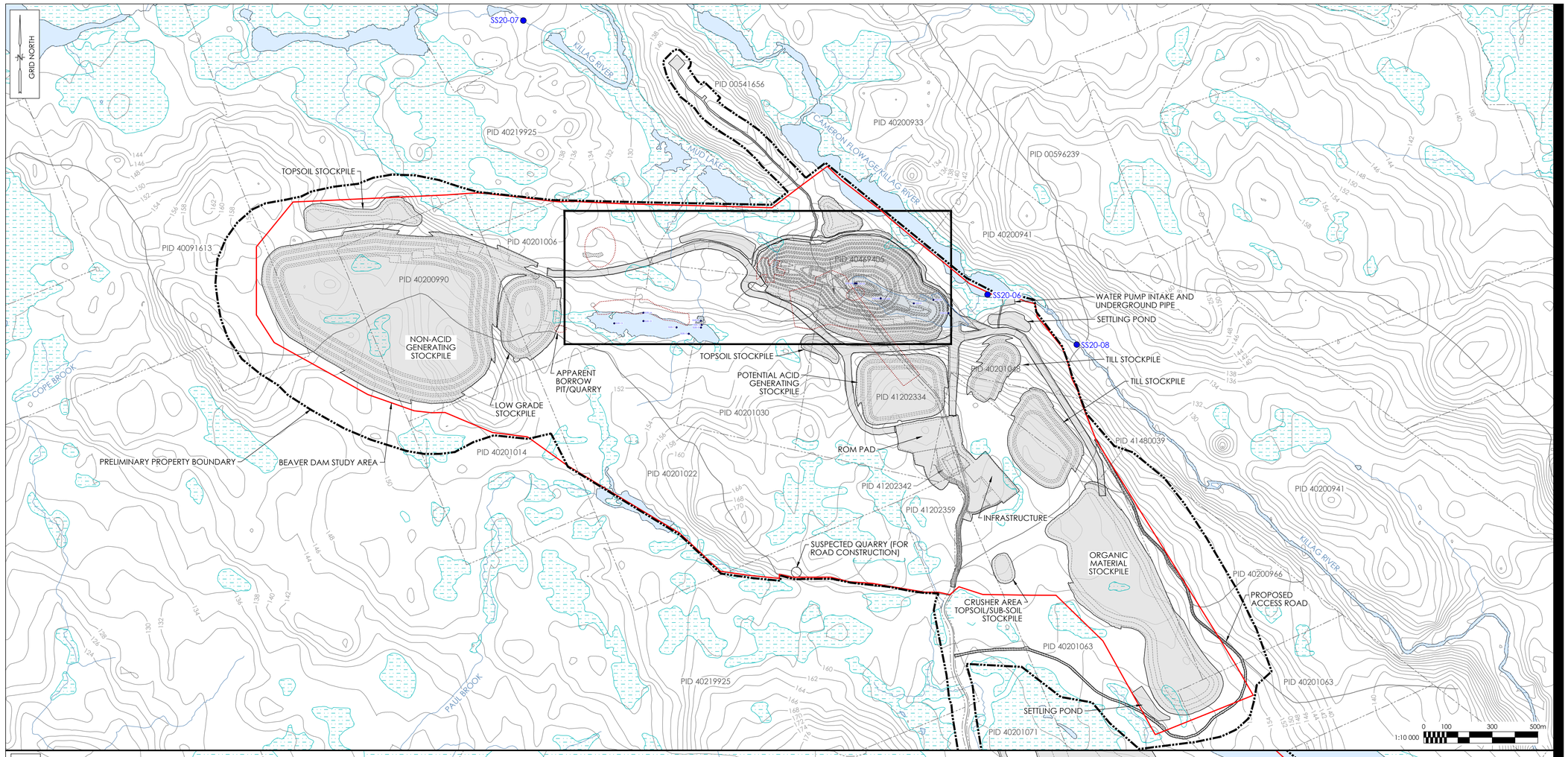

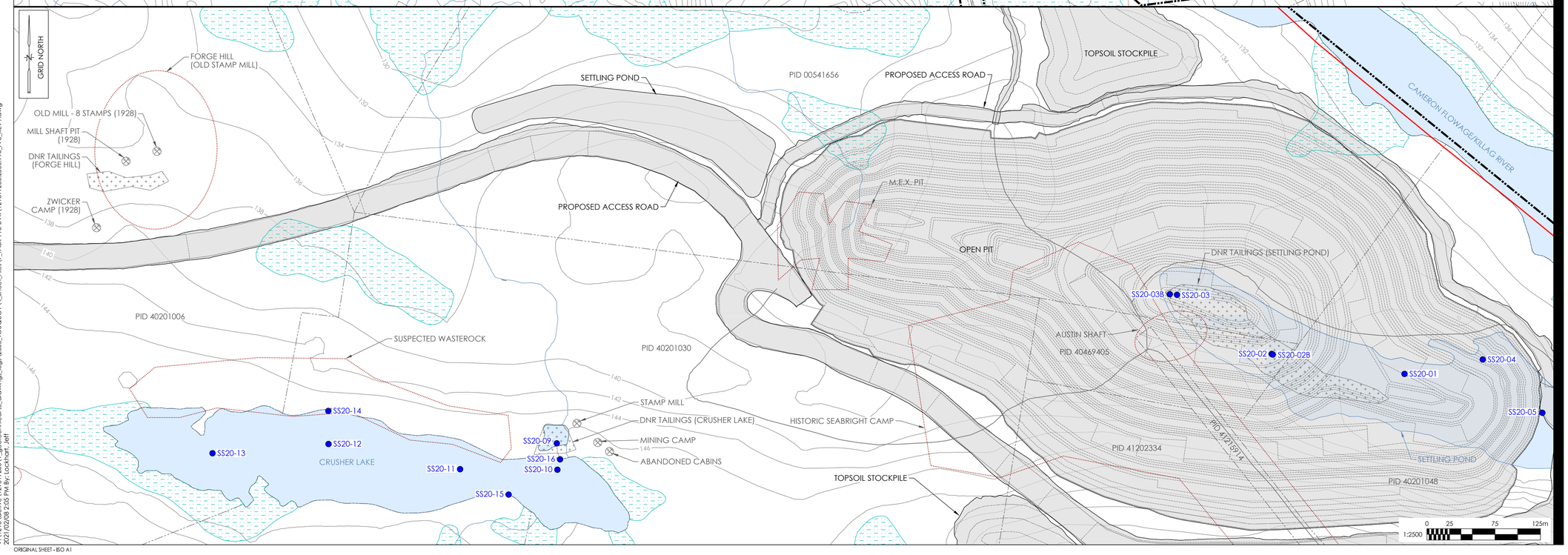

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- TOPOGRAPHIC CONTOUR (2m INTERVAL)
- PROPERTY BOUNDARY
- PRELIMINARY PROPERTY BOUNDARY
- EXISTING ROAD
- WATERCOURSE
- WETLAND
- WATERBODY
- PROPOSED MINING INFRASTRUCTURE
- REPORTED TAILINGS - DNR
- HISTORIC MINING OPERATIONS AREA
- HISTORICAL MINING FEATURE LOCATION
- SEDIMENT SAMPLE LOCATION (2020)

Notes

1. DATA SOURCES: GOVERNMENT OF CANADA, GOVERNMENT OF NOVA SCOTIA, McCALLUM AND ATLANTIC MINING NS INC., AUSENCO (DRAWING No. 105227-0000-G-101, REV D, 07/DEC2020).
2. LOCATIONS OF HISTORICAL MINING FEATURES ARE APPROXIMATE.

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HALIFAX COUNTY, NS

Title

SEDIMENT SAMPLE LOCATIONS (2020)

Project No.	Scale	
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Drawing No.	Sheet	Revision
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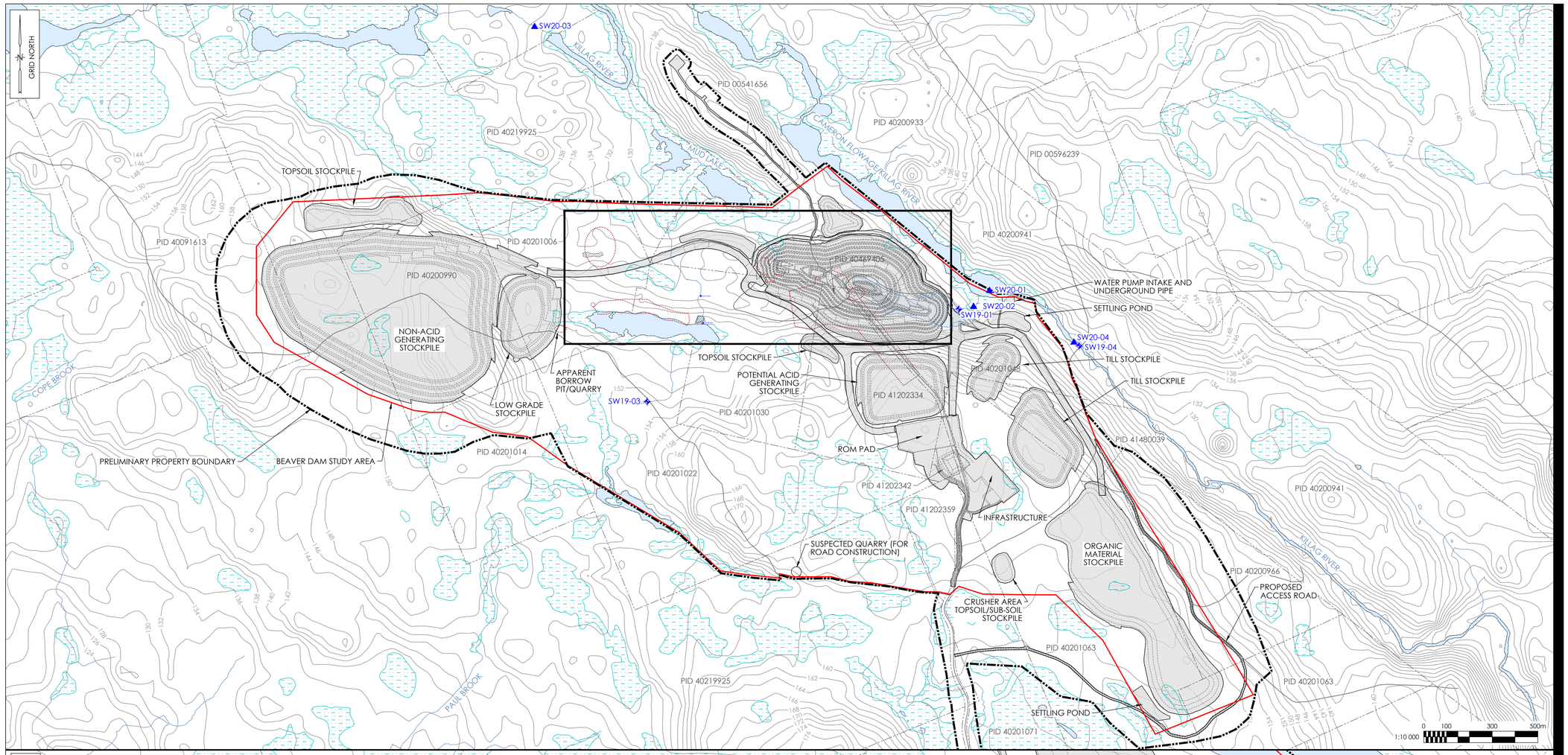

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- PROPERTY BOUNDARY
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- WETLAND
- WATERBODY
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- REPORTED TAILINGS - DNR
- HISTORIC MINING OPERATIONS AREA
- HISTORICAL MINING FEATURE LOCATION
- SURFACE WATER SAMPLE LOCATION (2019)
- SURFACE WATER SAMPLE LOCATION (2020)

Notes

1. DATA SOURCES: GOVERNMENT OF CANADA, GOVERNMENT OF NOVA SCOTIA, McCALLUM AND ATLANTIC MINING NS INC., AUSENCO (DRAWING No. 105227-0000-G-101, REV D, 07/DEC/2020).
2. LOCATIONS OF HISTORICAL MINING FEATURES ARE APPROXIMATE.

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ATLANTIC MINING NS INC.

BEAVER DAM PROJECT

HALIFAX COUNTY, NS

Title

SURFACE WATER SAMPLE LOCATIONS (2019 AND 2020)

Project No.	Scale	
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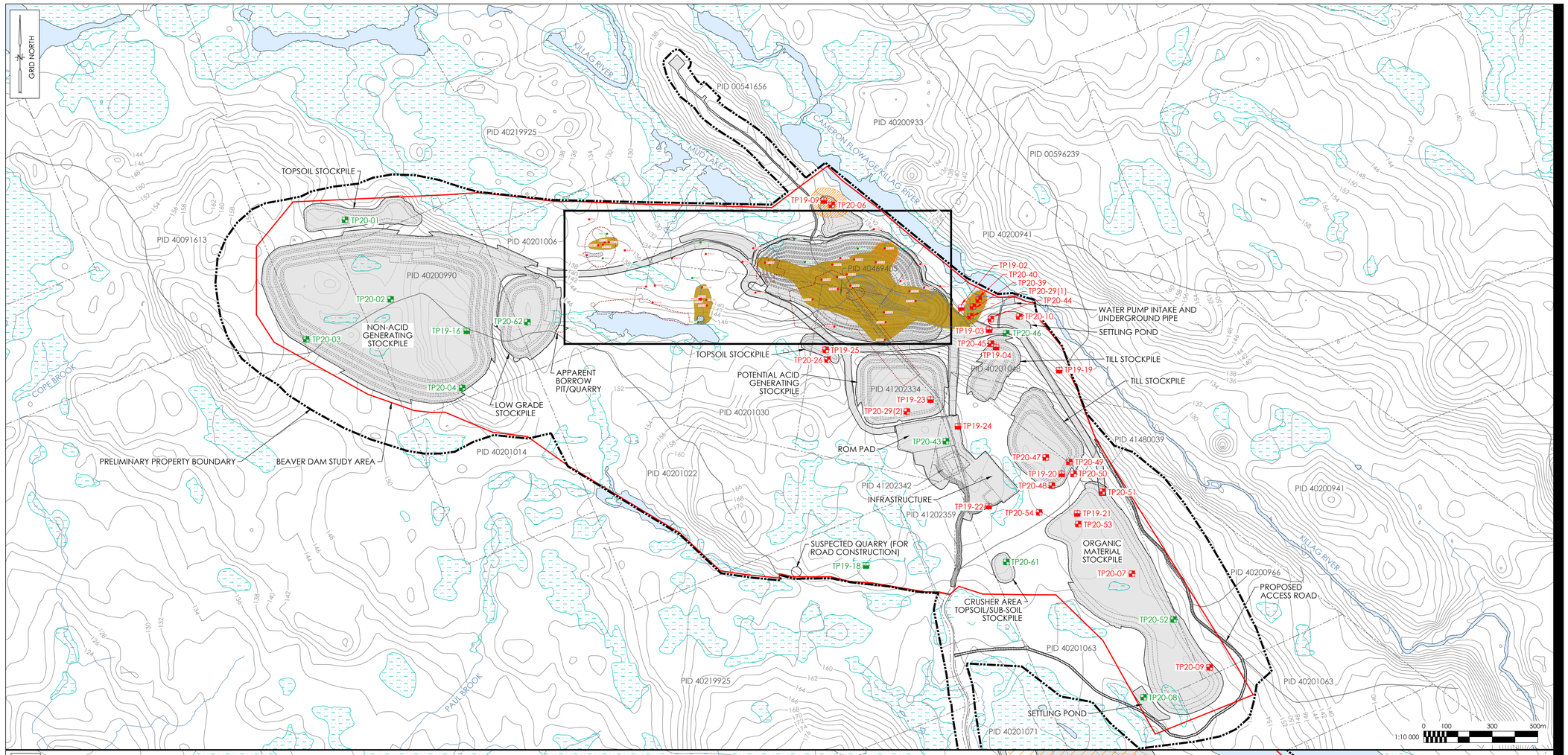

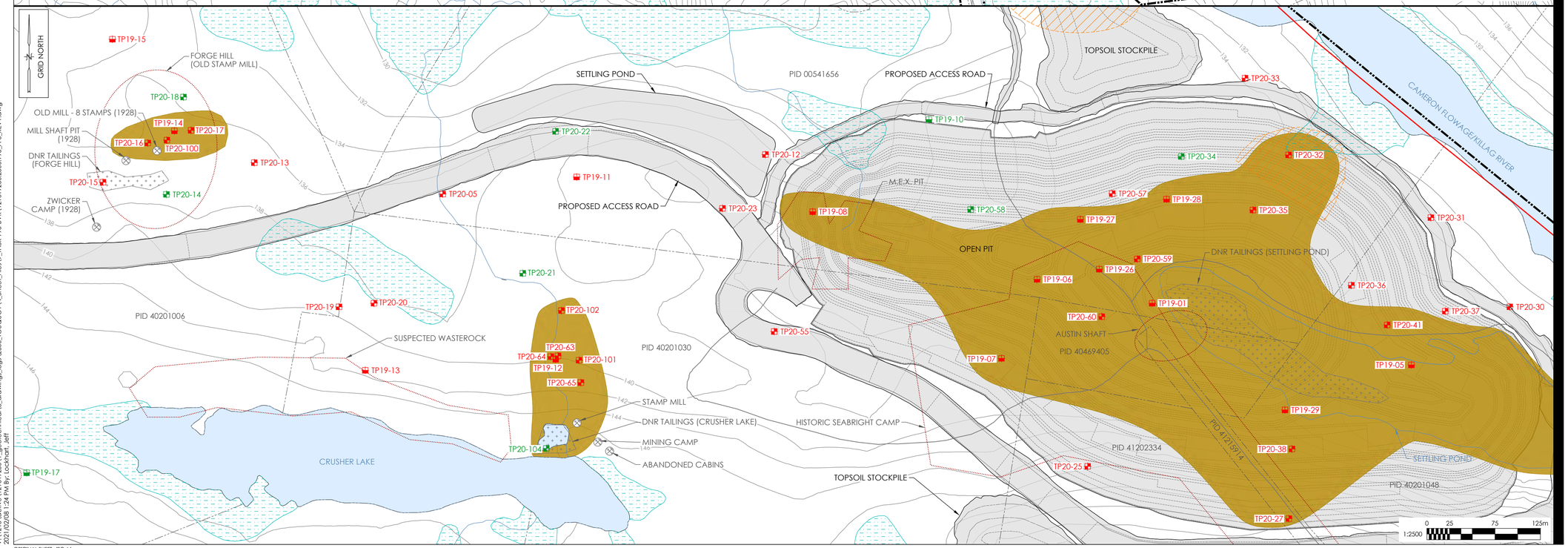

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- REPORTED TAILINGS - DNR
- HISTORIC MINING OPERATIONS AREA
- HISTORICAL MINING FEATURE LOCATION
- TEST PIT LOCATION (2020)
- TEST PIT LOCATION (2019)
- TEST PIT LOCATION - SOIL SAMPLE EXCEEDS NSE TIER I EQS FOR ARSENIC (>31 mg/kg) AT AN INDUSTRIAL SITE
- TEST PIT LOCATION - SOIL SAMPLE BELOW NSE TIER I EQS FOR ARSENIC (<31 mg/kg) AT AN INDUSTRIAL SITE
- POTENTIAL AREA OF ARSENIC IMPACTED SOIL RELATED TO HISTORICAL MINING OPERATIONS
- AREAS OF UNDELINEATED POTENTIAL ARSENIC IMPACTED SOIL RELATED TO HISTORICAL MINING OPERATIONS

Notes

1. DATA SOURCES: GOVERNMENT OF CANADA, GOVERNMENT OF NOVA SCOTIA, McCALLUM AND ATLANTIC MINING NS INC., AUSENCO (DRAWING No. 105227-0000-G-101, REV D, 07/DEC/2020).
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Client/Project

ATLANTIC MINING NS INC.

BEAVER DAM PROJECT

HALIFAX COUNTY, NS

Title

ARSENIC CONCENTRATIONS COMPARED TO NSE TIER 1 EQS (INDUSTRIAL LAND USE) AND POTENTIAL EXTENT OF ARSENIC IN SOIL RELATED TO HISTORICAL MINING OPERATIONS

Project No.	Scale	
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Drawing No.	Sheet	Revision
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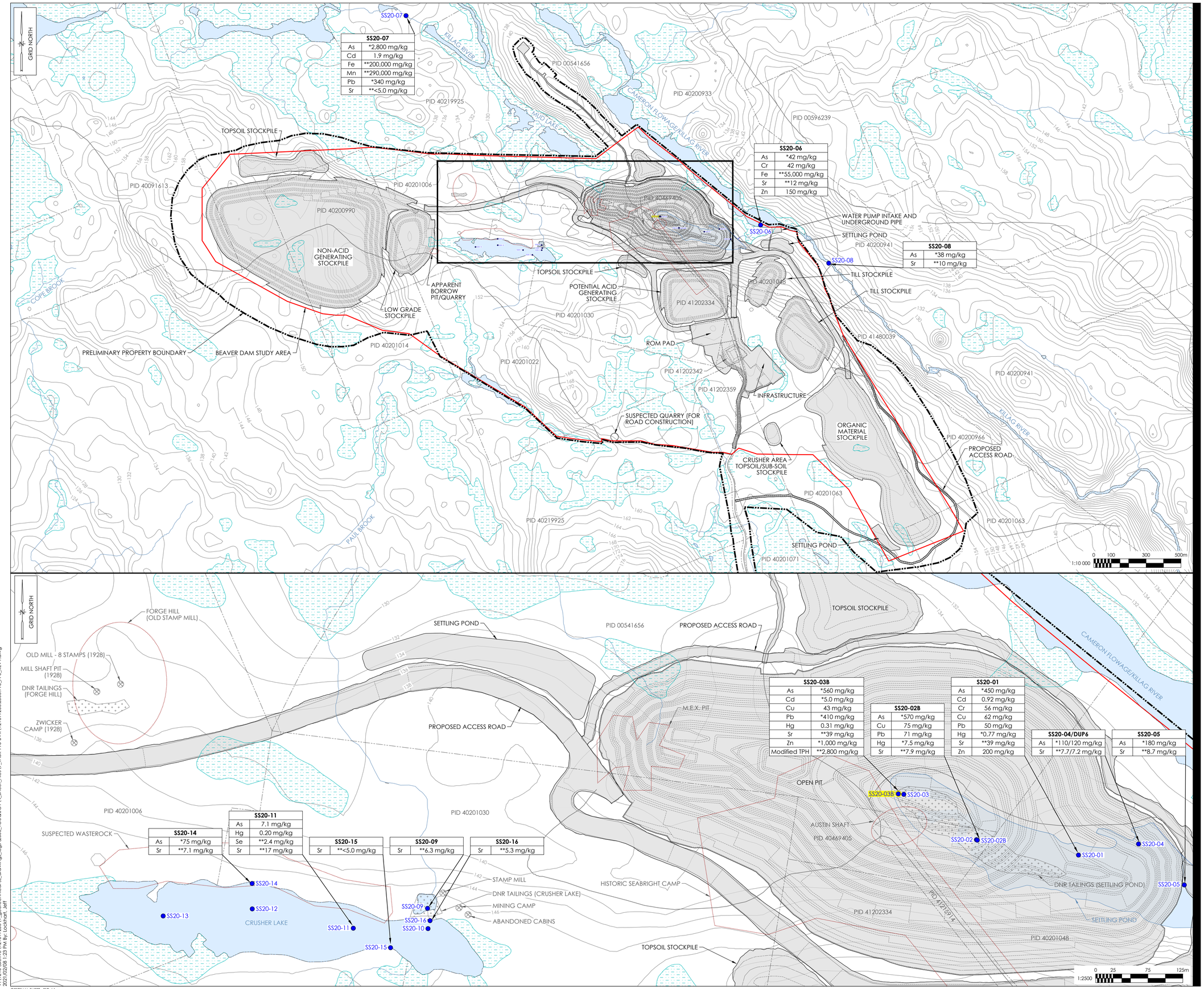

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- HISTORIC MINING OPERATIONS AREA
- HISTORICAL MINING FEATURE LOCATION
- SEDIMENT SAMPLE LOCATION (2020)
- SAMPLED FOR PETROLEUM HYDROCARBONS (PHC) (2020)
- 43 PARAMETER EXCEEDS ISQG
- *410 PARAMETER EXCEEDS ISQG, PEL AND TIER 1 EQS
- **8.7 PARAMETER EXCEEDS TIER 1 EQS (ISQG AND PEL NOT AVAILABLE)

Notes

1. DATA SOURCES: GOVERNMENT OF CANADA, GOVERNMENT OF NOVA SCOTIA, McCALLUM AND ATLANTIC MINING NS INC., AUSENCO (DRAWING No. 105227-0000-G-101, REV D, 07/DEC2020).
2. LOCATIONS OF HISTORICAL MINING FEATURES ARE APPROXIMATE.
3. PEL AND ISQG PARAMETERS COMPARED TO CANADIAN SEDIMENT QUALITY GUIDELINES FOR THE PROTECTION OF AQUATIC LIFE. TIER 1 EQS PARAMETERS COMPARED TO ENVIRONMENTAL QUALITY STANDARDS FOR FRESHWATER SEDIMENT.

1	INFRASTRUCTURE UPDATE	EA	MF	21.02.08
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Client/Project

ATLANTIC MINING NS INC.

BEAVER DAM PROJECT

HALIFAX COUNTY, NS

Title

METALS AND PHC CONCENTRATIONS IN SEDIMENT COMPARED TO NSE TIER 1 EQS AND CANADIAN SEDIMENT QUALITY GUIDELINES

Project No.	Scale	
121619250	AS SHOWN	
Drawing No.	Sheet	Revision
A-6	6 of 7	0

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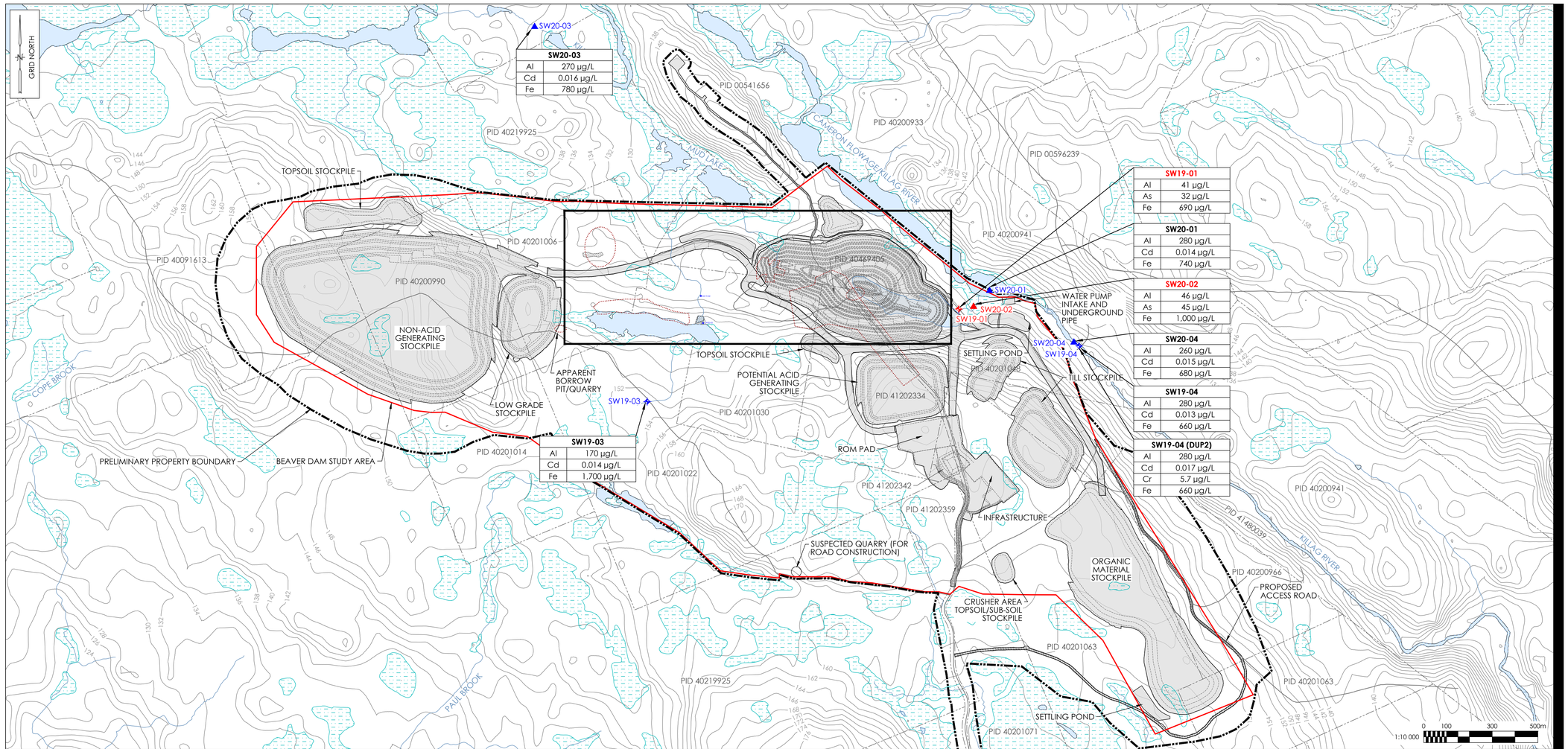

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- HISTORICAL MINING FEATURE LOCATION
- SURFACE WATER SAMPLE LOCATION (2019)
- SURFACE WATER SAMPLE LOCATION (2020)
- ARSENIC EXCEEDS TIER 1 EQS

SW20-02	
Al	46 µg/L
As	45 µg/L
Fe	1,000 µg/L

← ARSENIC EXCEEDS TIER 1 EQS
← PARAMETER EXCEEDS TIER 1 EQS

TIER 1 EQS PARAMETERS COMPARED TO ENVIRONMENTAL QUALITY STANDARDS FOR FRESHWATER SURFACE WATER.

Notes

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Client/Project

ATLANTIC MINING NS INC.

BEAVER DAM PROJECT

HALIFAX COUNTY, NS

Title

METALS CONCENTRATIONS IN SURFACE WATER COMPARED TO NSE TIER 1 EQS

Project No.	Scale	
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Drawing No.	Sheet	Revision
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APPENDIX B

Stratigraphy Records

Test Pits
Sediment Samples

Test Pit Sediment Descriptions
Atlantic Gold Corporation
Beaver Dam, Halifax, Nova Scotia
Stantec Consulting Ltd, Project No. 121619250.2500.995.200

Location ID	Date	Depth (mbg)	Soil Description
SS20-01	28-Jul-20	1.5	ORGANICS with fine sediments Sheen on water
SS20-02B Resample-SS20-02	28-Jul-20	0.3	WD = 0.3m, 0.1m ORGANICS sample thickness 0.3m, open at depth
SS20-03B	28-Jul-20	0.3	WD =1.5, 0.1m ORGANICS, 0.2m TAILINGS Refusal at 0.4mbg, petroleum hydrocarbon odour
SS20-04 & DUP 6	28-Jul-20	0.18	WD = 0.43m, 0.06m ORGANICS, 0.12m SEDIMENTS WASTE ROCK onshore adjacent to sample location.
SS20-05	28-Jul-20	0.75	WD = 0.75m, 0.3m ORGANICS, 0.45m SEDIMENT 0.45m, open at depth
SS20-06	28-Jul-20	0.35	WD = 0.24m, 0-0.15m ORGANICS and COBBLES 0.15m - 0.35m Grey brown SAND and GRAVEL
SS20-07	28-Jul-20	NR	GRAVEL, COBBLES and BOULDERS
SS20-08	28-Jul-20	0.15	0-0.15 GRAVELY SAND. Very rocky bottom Sampled up stream of liming station
SS20-09	28-Jul-20	0.17	0-0.2m ORGANICS, 0.2-0.17m suspected TAILINGS Suspected tailings found throughout area
SS20-10	28-Jul-20	NR	WD = 1.5m, ORGANICS No sample collected
SS20-11	29-Jul-20	NR	WD = 1.6m, ORGANICS Sample collected for characterization.
SS20-12	29-Jul-20	NR	WD = 1.8m, ORGANICS No sample collected
SS20-13	29-Jul-20	NR	WD = 0.85m, ORGANICS No sample collected
SS20-14	29-Jul-20	0.2	WD = 0.50m, brown, 0-0.20m sandy GRAVEL with organics
SS20-15	29-Jul-20	0.19	WD = 0.30m, 0-0.01 ORGANICS, 0.01-0.19 sandy GRAVEL with organics. Sample collected near shore.
SS20-16	29-Jul-20	0.2	0-0.05m ORGANICS, 0.05-0.20 dark brown sandy SILT Sample collected near shore.

TEST PIT: TP19-01

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Poorly graded black to brown silty SAND with cobbles - possible waste rock	0.00	1	SA
0.5	0.2					
			End of TEST PIT	0.25		
1.0	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-02

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Poorly graded brown silty SAND with cobbles - sample collected from side of bank	0.00		
0.5					2	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-03

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded grey to brown silty SAND with gravel and cobbles - moist - possible waste rock	0.00		
0.5					3	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-04

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded grey to borwn silty SAND with gravel and cobbles - moist - possible waste rock	0.00		
0.5						
	0.2				4	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-05

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - moist	0.00		
0.5					5	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-06

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm silty SAND - wet - possible tailings	0.00		
0.5					6	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-07

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown to grey silty SAND with gravel and cobbles - dry - possible waste rock	0.00	7	SA
0.5	0.2					
1.0	0.4		End of TEST PIT	0.30		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-08

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry - possible waste rock	0.00		
0.5						
	0.2				8	SA
1.0						
	0.4					
1.5			End of TEST PIT	0.45		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-09

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT firm poorly graded brown to grey silty SAND - dry	0.00		
0.5	0.2				9	SA
			End of TEST PIT	0.30		
1.0	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-10

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry	0.00	10	SA
0.5	0.2					
1.0						
	0.4		End of TEST PIT	0.35		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-11

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry	0.00		
0.5					11	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-12

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS	0.00	SA12 A	SA
0.5						
	0.2					
			Grey SILT - possible tailings	0.25	SA12 B	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-13

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm grey silty SAND - trace gravel - moist - possible tailings	0.00	13	SA
0.5	0.2					
			End of TEST PIT	0.25		
1.0	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-14

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS	0.00	14 A	SA
0.5						
	0.2					
			Firm sandy SILT with grass roots - moist - possible tailings	0.25	14 B	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-15

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS with firm grey sandy silt - moist - possible tailings	0.00		
0.5					15	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-16

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded grey silty SAND with gravel and cobbles - moist	0.00		
0.5					16	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-17

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS	0.00	SA17 A	SA
			Firm poorly graded reddish borwn silty SAND with gravel - dry	0.08	SA17 B	SA
0.5	0.2					
1.0	0.4		End of TEST PIT	0.30		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-18

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel - dry	0.00		
0.5					18	SA
	0.2					
1.0						
	0.4					
1.5						
			End of TEST PIT	0.35		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-19

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS - MOSS	0.00	SA19 A	SA
0.5						
	0.2					
			Firm poorly graded grey silty SAND with cobbles - wet	0.25	SA19 B	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-20

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry	0.00		
0.5					20	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-21

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown to grey silty SAND with gravel - dry	0.00		
0.5					21	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-22

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poosrly graded brown silty SAND with gravel - moist	0.00		
0.5						
	0.2				22	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-23

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel - dry	0.00		
0.5					23	SA
	0.2					
1.0						
			End of TEST PIT	0.35		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-24

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown silty SAND with gravel - dry	0.00	24	SA
0.5						
	0.2		End of TEST PIT	0.20		
1.0						
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-25

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown silty SAND with gravel - dry	0.00		
0.5					25	SA
	0.2					
1.0						
	0.4					
1.5						
			End of TEST PIT	0.35		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-26

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown to grey SILT - moist - possible tailings	0.00		
0.5					25	SA
	0.2					
1.0						
	0.4					
1.5						
			End of TEST PIT	0.35		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-27

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown SILT - moist - possible tailings	0.00		
0.5						
	0.2				27	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-28

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm grey SILT - moist - possible tailings	0.00	28	SA
0.5			End of TEST PIT	0.15		
	0.2					
1.0						
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP19-29

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - wet	0.00	29	SA
0.5						
	0.2		End of TEST PIT	0.20		
1.0						
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: TP20-01

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5						
	0.2		Grey SILT	0.17		
			Light brown SAND with silt - trace gravel - dry	0.21		
1.0						
	0.4					
1.5					1	GS
2.0	0.6					
			End of TEST PIT	0.68		
2.5						
	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-02

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Black ORGANIC material	0.06		
			Grey SILT	0.10		
0.5	0.2		Brown silty SAND with gravel	0.14	1	GS
1.0	0.4					
1.5	0.6					
2.0	0.8					
2.5						
3.0			End of TEST PIT	0.53		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-03

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number / Sample Type
			Ground Surface		
0.5			PEAT	0.00	
	0.2		Grey silty SAND with gravel	0.18	1 GS
1.0					
	0.4				
1.5					
			End of TEST PIT	0.50	
2.0	0.6				
2.5	0.8				
3.0					

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-04

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Brown sandy SILT with gravel - dry	0.08		
			Grey SILT - dry	0.13		
0.5			Brown sandy SILT with gravel - dry	0.16		
	0.2					
					1	GS
1.0						
	0.4					
1.5						
			End of TEST PIT	0.47		
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-05

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	23-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey to light brown fine silt TILL - trace gravel - moist	0.05		
0.5	0.2		- test pit terminated on gravel End of TEST PIT	0.14	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-06

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Brown silty SAND with gravel - roots throughout	0.10	1	GS
1.0	0.4					
1.5						
			End of TEST PIT	0.50		
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-07

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Brown SILT	0.08		
0.5	0.2		- test pit terminated on cobbles			
			End of TEST PIT	0.23	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-08

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Grey fine sandy silt TILL - some gravel - dry	0.15		
1.0	0.4					
1.5						
	0.6		End of TEST PIT	0.57	1	GS
2.0						
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-09

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number / Sample Type
			Ground Surface		
			ROOTMAT	0.00	
			Brown sandy SILT - roots throughout	0.10	
0.5	0.2				
1.0	0.4				
1.5	0.6				
2.0			- test pit terminated on bolder		
			End of TEST PIT	0.66	1 / GS
2.5	0.8				
3.0					

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-10

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
0.5			PEAT/ORGANICS	0.00		
	0.2		Grey SILT	0.18		
1.0			Dark brown sandy SILT - trace gravel - dry	0.22	1	GS
	0.4					
1.5						
2.0	0.6					
			End of TEST PIT	0.65		
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-11

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			PEAT	0.00		
0.5	0.2					
1.0			GRAVEL - trace dark grey silt - wet	0.30	1	GS
	0.4					
1.5						
			End of TEST PIT	0.55		
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-12

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			PEAT/ROOTMAT	0.00		
0.5						
	0.2		Grey SILT	0.17		
			Reddish brown silty SAND and gravel	0.22		
1.0						
	0.4					
1.5						
			End of TEST PIT	0.53	1	GS
2.0						
	0.6					
2.5						
	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-13

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Reddish brown silty SAND and gravel - dry	0.20		
1.0	0.4					
1.5					1	GS
2.0	0.6					
			End of TEST PIT	0.71		
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-14

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number / Sample Type
			Ground Surface		
			ROOTMAT	0.00	
			Dark brown to black silty ORGANICS with grey layer - gravel at bottom	0.12	
0.5	0.2				
1.0	0.4				
1.5	0.6				
2.0			- test pit terminated on gravel		
			End of TEST PIT	0.66	1 / GS
2.5	0.8				
3.0					

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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TEST PIT: TP20-15

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Brownish grey sandy SILT - boulders at bottom - dry	0.07		
0.5			- test pit terminated on boulder			
			End of TEST PIT	0.17	1	GS
	0.2					
1.0						
	0.4					
1.5						
	0.6					
2.0						
	0.8					
2.5						
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-16

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Grey SAND - suspected tailings - trace gravel - moist	0.14		
1.0	0.4					
1.5						
			End of TEST PIT	0.52	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-17

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey SILT - waste rock/suspected tailings - moist	0.07		
0.5	0.2					
1.0	0.4					
1.5						
			End of TEST PIT	0.56	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-18

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			ROOTMAT	0.00
			Dark brown ORGANICS - roots throughout - gravel at bottom - wet	0.08
0.5	0.2			
1.0	0.4			
1.5				
2.0	0.6			
2.5	0.8		End of TEST PIT	0.80
3.0				

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-19

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Orange brown silty SAND with gravel - dry	0.13		
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8		End of TEST PIT	0.75	1	GS
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-20

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			ROOTMAT	0.00
			GRAVEL with dark grey sand and organics - wet	0.08
0.5	0.2			
1.0	0.4			
1.5				
2.0	0.6			
2.5	0.8			
3.0				
			End of TEST PIT	0.66

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-21

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Dark brown SILT with roots throughout - gravel at bottom - moist	0.05		
0.5	0.2					
1.0	0.4					
1.5			End of TEST PIT	0.50	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-22

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	23-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey silt with gravel TILL - dry	0.06	A	
0.5			Reddish brown silt with sand TILL - dry	0.11		
	0.2					
			Light brown silt TILL	0.22	B	
1.0						
	0.4		End of TEST PIT	0.40		GS
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-23

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey SILT	0.10		
0.5	0.2		Reddish brown silty SAND and gravel	0.20	1	GS
1.0	0.4					
1.5	0.6					
2.0	0.8					
2.5						
3.0			End of TEST PIT	0.57		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-25

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	23-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Orange brown silty sand with gravel and cobbles TILL - roots throughout - dry	0.09		
0.5	0.2		- test pit terminated on cobbles			
			End of TEST PIT	0.28	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-26

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	23-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey silt sand with gravel TILL - dry	0.07		
0.5	0.2		Red brown silt TILL - dry	0.12		
			End of TEST PIT	0.27	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-27

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	23-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Red brown silty SAND with gravel	0.01		
0.5						
	0.2		End of TEST PIT	0.19	1	GS
1.0						
	0.4					
1.5						
	0.6					
2.0						
	0.8					
2.5						
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-29 (1)

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Dark brown silty SAND with gravel and organics	0.08		
0.5	0.2					
1.0	0.4					
1.5						
	0.6		End of TEST PIT	0.59	1	GS
2.0						
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-29 (2)

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey SILT - dry	0.11		
			Reddish brown silty SAND and gravel - dry	0.13		
0.5	0.2					
1.0	0.4					
1.5						
	0.6		End of TEST PIT	0.57	1	GS
2.0						
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-30

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Brown SAND with gravel and cobbbles - possible waste rock - dry	0.11		
1.0	0.4					
1.5						
	0.6		End of TEST PIT	0.59	1	GS
2.0						
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-31

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			PEAT/ORGANICS	0.00		
			Grey SILT - dry	0.09		
			Brown silty SAND with gravel - dry	0.11	1	GS
0.5	0.2					
1.0	0.4					
1.5						
	0.6					
2.0						
2.5	0.8					
3.0						
			End of TEST PIT	0.55		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-32

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		GRAVEL with brown sand - some cobbles - dry	0.07	1	GS
			End of TEST PIT	0.28		
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-33

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number / Sample Type
			Ground Surface		
			ROOTMAT	0.00	
0.5	0.2		Brown to reddish brown silty SAND with gravel - dry	0.11	1 / GS
1.0	0.4		End of TEST PIT	0.40	
1.5	0.6				
2.0	0.8				
2.5					
3.0					

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-34

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT and ORGANICS	0.00		
0.5	0.2		Brown SILT with organics and gravel - wet	0.14	1	GS
1.0	0.4					
1.5	0.6					
2.0	0.8					
2.5			End of TEST PIT	0.68		
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-35

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5			Grey SILT - dry	0.15		
	0.2		Dark brown silty SAND with gravel and organics - dry	0.21	1	GS
1.0						
	0.4					
1.5						
			End of TEST PIT	0.48		
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-36

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Dark brown silty SAND with gravel - dry	0.08	1	GS
1.0	0.4					
1.5	0.6					
2.0	0.8					
2.5						
3.0						
			End of TEST PIT	0.48		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-37

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Light brown silty SAND with gravel - dry	0.01		
0.5	0.2					
1.0	0.4					
1.5						
			End of TEST PIT	0.50	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-38

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	23-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Brown silty SAND with gravel - dry	0.08		
0.5	0.2		- test pit terminated on gravel			
			End of TEST PIT	0.26	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-39

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Grey gravelly SILT with organics - suspected tailings - wet	0.12	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8		End of TEST PIT	0.70		
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-40

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT and organic soil	0.00		
			Dark grey SILT with cobbles and organics - wet	0.09	1	GS
0.5	0.2					
1.0	0.4					
			End of TEST PIT	0.42		
1.5	0.6					
2.0						
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-41

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey SILT - dry	0.10		
0.5						
	0.2		Dark brown silty SAND with gravel - dry	0.17		
1.0					1	GS
	0.4					
1.5						
			End of TEST PIT	0.56		
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-43

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number / Sample Type
			Ground Surface		
			PEAT/ORGANICS	0.00	
			Grey SILT layer - dry	0.11	
0.5			Reddish brown silty SAND with gravel and cobbles - dry	0.17	
	0.2				
1.0					
	0.4				
1.5			End of TEST PIT	0.48	1 / GS
	0.6				
2.0					
	0.8				
2.5					
3.0					

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-44

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Greyish brown silty SAND and gravel - dry	0.01		
0.5	0.2					
			End of TEST PIT	0.24	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-45

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			PEAT	0.00		
			Dark grey SILT - trace gravel and organics - dry	0.08		
0.5	0.2					
1.0	0.4					
1.5						
			End of TEST PIT	0.51	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-46

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			PEAT/ORGANICS	0.00		
			Grey SILT with organics - DRY	0.04		
0.5	0.2					
1.0	0.4				1	GS
1.5						
2.0	0.6					
			End of TEST PIT	0.63		
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-47

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			ROOTMAT	0.00
0.5	0.2		Dark grey SILT - roots throughout - trace gravel - dry	0.11
1.0	0.4			
			End of TEST PIT	0.42
1.5	0.6			
2.0				
2.5	0.8			
3.0				

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-48

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Reddish brown silty CLAY - gravel at bottom	0.10		
0.5	0.2					
1.0	0.4					
			End of TEST PIT	0.43		
1.5					1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-49

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Light brown sandy SILT - gravel at bottom	0.07		
0.5	0.2					
1.0	0.4					
			End of TEST PIT	0.42	1	GS
1.5	0.6					
2.0						
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-50

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Brown silty SAND - gravel at bottom - dry	0.07		
0.5	0.2					
1.0						
	0.4		End of TEST PIT	0.39	1	GS
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-51

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Dark brown SILT - trace gravel - moist	0.06		
0.5	0.2					
			End of TEST PIT	0.26	1	GS
1.0	0.4					
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-52

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Grey silty SAND with gravel and cobbles - moist	0.12		
1.0	0.4					
1.5						
			End of TEST PIT	0.52	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-53

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Red brown with green sandy SILT - gravel at bottom	0.04		
0.5	0.2					
1.0	0.4					
1.5						
2.0	0.6					
			End of TEST PIT	0.63	1	GS
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-54

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Grey brown sandy SILT - trace gravel - moist	0.14		
1.0	0.4		- test pit terminated on slate		1	GS
1.5						
			End of TEST PIT	0.54		
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-55

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number / Sample Type
			Ground Surface		
			ROOTMAT	0.00	
			Reddish brown sandy SILT with gravel - dry	0.09	
0.5	0.2				
1.0	0.4				
1.5					
			End of TEST PIT	0.50	
2.0	0.6				
2.5	0.8				
3.0					

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-57

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Brown sandy SILT - trace gravel - dry	0.01	1	GS
0.5	0.2					
1.0	0.4					
1.5						
			End of TEST PIT	0.57		
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-58

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			ROOTMAT	0.00
			Brown SAND with silt TILL - roots throughout - dry	0.03
0.5	0.2			
1.0	0.4			
1.5				
			End of TEST PIT	0.49
2.0	0.6			
2.5	0.8			
3.0				

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-59

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey silty SAND with gravel and organic matterial - suspected tailings	0.05		
0.5	0.2					
1.0	0.4					
1.5						
			End of TEST PIT	0.53	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-60

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	20-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey sandy SILT - dry	0.02		
0.5	0.2				1	GS
1.0	0.4					
			End of TEST PIT	0.41		
1.5						
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-61

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	21-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Light brown silty SAND - gravel at bottom	0.11		
0.5	0.2					
1.0	0.4					
1.5						
			End of TEST PIT	0.57	1	GS
2.0	0.6					
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-62

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey SILT - moist	0.13		
0.5			Reddish brown sandy SILT with gravel - moist to wet	0.15		
	0.2					
1.0					1	GS
	0.4					
1.5						
	0.6		End of TEST PIT	0.60		
2.0						
2.5						
	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-63

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			ROOTMAT	0.00
			Grey TAILINGS	0.10
0.5	0.2			
1.0				
	0.4		Black ORGANIC material	0.33
1.5			End of TEST PIT	0.45
2.0	0.6			
2.5	0.8			
3.0				

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-64

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number / Sample Type
			Ground Surface		
			ROOTMAT	0.00	
			Brown grey fine SILT - gravel at bottom - moist to wet	0.12	
0.5	0.2				
1.0	0.4				
1.5					
2.0	0.6				
			End of TEST PIT	0.65	1 / GS
2.5	0.8				
3.0					

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-65

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	23-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey SAND - suspected tailings - moist	0.10		
0.5	0.2					
1.0	0.4					
1.5	0.6					
2.0					1	GS
2.5	0.8		End of TEST PIT	0.75		
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-100

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
			Grey brown SAND - suspected tailings - moist	0.03		
0.5						
	0.2					
1.0						
			- test pit terminated on gravel			
	0.4		End of TEST PIT	0.39	1	GS
1.5						
	0.6					
2.0						
	0.8					
2.5						
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

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Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-101

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	C. BAXTER & P. TURNER	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT	0.00		
0.5	0.2		Grey SAND - suspected tailings - moist	0.12	A	
1.0	0.4					
1.5					B	
2.0	0.6		End of TEST PIT	0.60		GS
2.5	0.8					
3.0						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
GS - grab sample
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

TEST PIT: TP20-102

Project:	EXTENDED PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	22-Jul-2020
Location:	BEAVER DAM, HALIFAX, NOVA SCOTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.995	**Top of casing elevation:**	n/a
Field investigator:	E. ARSENAULT & MICHEL COMEAU	**Easting:**	n/a
Contractor:	STANTEC	**Northing:**	n/a

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)
			Ground Surface	
			Black ORGANICS	0.00
			Grey suspected TAILINGS - wet	0.08
0.5	0.2			
1.0	0.4			
1.5				
			End of TEST PIT	0.50
2.0	0.6			
2.5	0.8			
3.0				

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: G. MANLEY

STANTEC BOREHOLE AND WELL V2 121619250.2500.995_BEAVER_DAM_SEPT2020.GPJ STANTEC - DATA TEMPLATE.GDT 10/6/20 GWHALEN

APPENDIX C

Analytical Tables

Table C - 1 - Soil Metals Chemistry
Table C - 2 - Sediment Metals Chemistry
Table C - 3 - Sediment Petroleum Hydrocarbon Chemistry
Table C - 4 - Surface Water Metals Chemistry
Table C - 5 - Soil Relative Percent Differences of Duplicates (2020)
Table C - 6 - Sediment Relative Percent Differences of Duplicates (2020)

TABLE C-1 **SOIL METALS CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	Sample Location:	TP20-01	TP20-02	TP20-03	TP20-04	TP20-05	TP20-06	TP20-07	TP20-08	TP20-09	TP20-10	TP20-12	TP20-13	
				Sample Name:	TP20-01	TP20-02	TP20-03	TP20-04	TP20-05	TP20-06	TP20-07	TP20-08	TP20-09	TP20-10	TP20-12	TP20-13	TP20-DUP5
				Soil description and nearby features:	Undisturbed ground within cut block	Natural soil at edge of cut block	Natural forested ground	Undisturbed ground	Grey silt sand	Brown sand gravel silt with roots; near water; potentially reworked area	Brown silty sand	Till	Brown silty sand	Dark brown sandy silt	Natural soil	Natural soil	Dup of TP20-13
				2020 Infrastructure Area:	TSSP	NAG stockpile	NAG stockpile	NAG stockpile	Road	TSSP	Organic material stockpile	Settling pond	Organic material stockpile	Settling pond	Settling pond	None	None
				Sample Depth (mbgs):	0.17-0.68	0.10-0.53	0.18-0.50	0.08-0.47	0.05-0.14	0.10-0.50	0.08-0.23	0.15-0.57	0.10-0.66	0.18-0.65	0.17-0.53	0.20-0.71	-
				Date Sampled:	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	20-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	23-Jul-20	22-Jul-20	22-Jul-20
				Maximum													
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	47,000	47,000	11,000	1,200	16,000	12,000	19,000	13,000	3,700	27,000	26,000	31,000	41,000	41,000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	5.4	<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
Acid Extractable Arsenic (As)	mg/kg	2.0	31	3,900	11	7.1	<2.0	15	**100**	**2800**	**62**	8.1	**53**	**71**	**44**	**40**	**44**
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	82	39	19	5.8	26	17	29	13	5.2	30	25	17	32	32
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	2	<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
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	6	<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
Acid Extractable Boron (B)	mg/kg	50	24,000	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<51	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	49	49	13	<2.0	17	22	24	<52	5.2	27	26	35	39	39
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	36	5.4	1.7	<1.0	3.8	3.2	2.9	<53	1.6	6.2	8.0	7.2	8.0	8.3
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	61	13	3.6	<2.0	7.3	6.4	11	<54	<2.0	11	20	22	19	21
Acid Extractable Iron (Fe)	mg/kg	50	144,000	67,000	41,000	19,000	740	36,000	34,000	36,000	<55	5,300	31,000	30,000	67,000	40,000	43,000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	200	15	15	3	11	11	18	<56	3.8	12	13	13	16	16
Acid Extractable Lithium (Li)	mg/kg	2.0	-	57	57	11	<2.0	20	8.7	18	<57	3.7	35	31	25	26	27
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	1,500	250	82	18	300	260	330	<58	96	250	350	370	410	410
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	40	0.25	<0.10	<0.10	0.12	0.16	0.15	<59	<0.10	0.18	0.18	0.21	0.23	0.26
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<60	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	52	12	3.8	<2.0	7.3	9.5	7.6	<61	4.1	16	20	16	17	18
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	47	11	8.9	<2.0	14	9.8	7.5	<62	3.2	9.1	12	8.4	10	10
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	6.4	2.2	0.64	<0.50	1.8	0.77	1.2	<63	<0.50	1.5	1.2	2.2	2.0	2.0
Acid Extractable Silver (Ag)	mg/kg	0.50	490	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<64	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	16	<5.0	<5.0	<5.0	5	<5.0	5.9	<65	<5.0	6.4	7.3	<5.0	5.5	<5.0
Acid Extractable Thallium (Tl)	mg/kg	0.10	1	0.63	0.18	<0.10	<0.10	0.12	0.11	0.13	<66	<0.10	0.1	0.14	0.14	0.18	0.16
Acid Extractable Tin (Sn)	mg/kg	varies	122,000	1.6	1.5	1.4	<1.0	<1.0	1.2	1.1	<67	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	8.5	1.2	0.68	0.56	0.88	0.67	0.51	<68	0.18	0.77	0.82	0.71	0.91	0.88
Acid Extractable Vanadium (V)	mg/kg	2.0	160	76	62	42	2.2	33	68	40	<69	11	32	29	46	47	49
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	140	53	12	<5.0	26	31	41	<70	9.8	40	57	67	56	55

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Non-Potable site; coarse-grained soil, industrial land use. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A
RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
- = no standard available, not applicable
NAG = Non-Acid Generating
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TSSP = Top-Soil/Sub-Soil Stockpile

38 = Exceeds NSE Tier 1 EQS

Field Identified Tailings - "Impacted Soils"
Field Identified Waste Rock/Old Mine Workings - "Impacted Soils"
Field Identified Native Ground - "Non-Impacted Soils"

TABLE C-1 **SOIL METALS CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	Sample Location:	TP20-14	TP20-15	TP20-16	TP20-17	TP20-18	TP20-19	TP20-20	TP20-21	TP20-22A	TP20-22B	TP20-23	TP20-25	TP20-26	TP20-27	TP20-29 (1)	TP20-29 (2)	TP20-30
				Sample Name:	TP20-14	TP20-15	TP20-16	TP20-17	TP20-18	TP20-19	TP20-20	TP20-21	TP20-22A	TP20-22B	TP20-23	TP20-25	TP20-26	TP20-27	TP20-29 (1)	TP20-29 (2)	TP20-30
				Soil description and nearby features:	Organics with grey layer near reported tailings (Forge Hill)	Brown with grey silty sand near reported tailings (Forge Hill)	Suspect tailings near old stamp mill	Waste rock over suspect tailings near old stamp mill	Organics, near wetland	Orange brown silty sand with gravel, downhill from waste rock pile	Gravel with dark grey sand and organics at edge of waste rock pile	Dark brown silty organic	Grey till with gravel, red-brown silt and sand	Light brown-grey silt	Natural soil	Grey silt sand till over orange-brown silt sand till in cobbles	Orange brown silty sand. South of pit and apparent waste rock pile	Brown silty sand. Waste rock at surface, Reworked area	Silty sand, some cobbles, coarse gravel near old tailings ponds	Reddish brown sand with silt and gravel with grey silt layer, undisturbed	Brown sand with gravel and cobbles. Possible waste rock at edge of waste rock pile
				2020 Infrastructure Area:	None	None	None	None	None	None	None	None	Road	Road	Road	Open pit	TSSP	Open pit	Road	PAG Stockpile	Road
				Sample Depth (mbgs):	0.12-0.66	0.07-0.17	0.14-0.52	0.07-0.56	0.08-0.80	0.13-0.75	0.08-0.66	0.05-0.50	0.06-0.22	0.22-0.40	0.10-0.57	0.09-0.28	0.07-0.27	0.01-0.19	0.08-0.59	0.11-0.57	0.11-0.59
				Date Sampled:	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	23-Jul-20	23-Jul-20	23-Jul-20	23-Jul-20	23-Jul-20	23-Jul-20	20-Jul-20	23-Jul-20	21-Jul-20
				Maximum																	
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	47,000	25,000	14,000	21,000	22,000	13,000	32,000	23,000	24,000	14,000	14,000	43,000	9,600	22,000	24,000	27,000	35,000	28,000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	5.4	<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
Acid Extractable Arsenic (As)	mg/kg	2.0	31	3,900	15	**130**	**240**	**460**	24	**48**	**59**	10	24	16	**61**	**61**	**44**	**250**	**230**	**50**	**110**
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	82	24	30	58	72	36	23	70	13	12	12	29	17	21	33	43	42	28
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	2	2.3	<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
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	6	<2.0	<2.0	<2.0	3.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	5.6	<2.0	<2.0	<2.0	<2.0
Acid Extractable Boron (B)	mg/kg	50	24,000	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<	<0.30	<0.30	<0.30	<0.30	0.4	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	49	22	21	31	33	8.6	41	36	18	18	15	40	12	24	29	32	40	31
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	36	2.0	3.8	11	4.8	4.1	4.5	12	<1.0	3	4.1	8.4	1.9	3.3	13	18	9.8	7.8
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	61	29	7.8	28	46	28	7.9	33	37	5.2	5.6	18	4.8	10	29	12	17	16
Acid Extractable Iron (Fe)	mg/kg	50	144,000	67,000	4,200	27,000	38,000	42,000	2,900	64,000	41,000	1,600	38,000	33,000	44,000	27,000	47,000	34,000	31,000	37,000	31,000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	200	18	14	11	110	15	12	9.5	21	14	7.3	15	13	34	13	15	15	14
Acid Extractable Lithium (Li)	mg/kg	2.0	-	57	6.4	14	40	47	<2.0	23	41	2.2	13	14	31	7.2	32	38	48	40	34
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	1,500	63	210	510	400	58	170	490	19	170	180	330	160	150	520	1200	440	320
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	40	0.29	0.14	0.10	17	0.98	0.15	0.13	0.55	0.15	0.11	0.22	0.15	0.2	0.11	0.27	0.15	0.19
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<	<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
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	52	7.0	9.3	26	9.9	20	12	26	5	7.2	5.5	20	5.4	7.9	25	22	25	21
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	47	5.2	10	28	47	2.2	17	38	2.2	8.3	10	11	5.6	8.5	15	13	14	9.7
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	6.4	5.2	<0.50	<0.50	<0.50	3.4	2.1	<0.50	6.4	1.1	0.92	2.3	0.8	1.4	0.67	1.4	1.6	1.7
Acid Extractable Silver (Ag)	mg/kg	0.50	490	1.2	0.69	<0.50	<0.50	0.62	0.69	<0.50	<0.50	0.82	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	16	5.7	8.3	6.7	<5.0	16	<5.0	<5.0	<5.0	<5.0	<5.0	5.2	<5.0	<5.0	7.3	7.3	6.7	<5.0
Acid Extractable Thallium (Tl)	mg/kg	0.10	1	0.63	0.13	<0.10	0.21	0.39	<0.10	0.16	0.28	<0.10	0.13	0.13	0.16	<0.10	0.15	0.12	0.22	0.16	0.17
Acid Extractable Tin (Sn)	mg/kg	varies	122,000	1.6	<1.0	<1.0	<1.0	1	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	8.5	2.2	0.35	1	0.66	1.6	0.76	0.75	8.5	0.49	0.52	0.76	0.42	0.75	0.81	1.5	0.79	0.88
Acid Extractable Vanadium (V)	mg/kg	2.0	160	76	10	42	36	40	6	76	47	8.6	52	42	42	44	63	33	34	44	31
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	140	17	43	76	65	20	44	71	7.1	30	27	75	22	31	62	76	79	56

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Non-Potable site; coarse-grained soil, industrial land use. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A

RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
- = no standard available, not applicable
NAG = Non-Acid Generating
PAG = Potentially Acid-Generating
TSSP = Top-Soil/Sub-Soil Stockpile

38 = Exceeds NSE Tier 1 EQS

Field Identified Tailings - "Impacted Soils"
Field Identified Waste Rock/Old Mine Workings - "Impacted Soils"
Field Identified Native Ground - "Non-Impacted Soils"

TABLE C-1 **SOIL METALS CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	Sample Location:	TP20-31	TP20-32	TP20-33	TP20-34	TP20-35	TP20-36	TP20-37	TP20-38	TP20-39		TP20-40	TP20-41	TP20-43	TP20-44	
				Sample Name:	TP20-31	TP20-32	TP20-33	TP20-34	TP20-35	TP20-36	TP20-37	TP20-38	TP20-39	TP20-DUP1	TP20-40	TP20-41	TP20-43	TP20-44	TP20-DUP-2
Soil description and nearby features:					Natural ground	Gravel with brown sand	Undisturbed ground	Natural deposit	Natural soil	Dark brown sand with gravel and silt, reworked area along road	Sand, gravel, silt, edge of reworked area	Brown silty sand with gravel	Grey silt and gravel, possible tailings	Dup of TP20-39	Grey, organic, near water	Dark brown sand with gravel and silt, reworked edge of road	Natural soil	Grey-brown sand with silt and gravel, edge of waste rock area	Dup of TP20-44
2020 Infrastructure Area:					Road	Open pit	None	Open pit	Open pit	Open pit	Open pit	Open pit	None	None	None	Open pit	Crusher pad	None	None
Sample Depth (mbgs):					0.09-0.55	0.07-0.28	0.11-0.40	0.14-0.68	0.15-0.48	0.08-0.48	0.01-0.50	0.08-0.26	0.12-0.70	-	0.09-0.42	0.10-0.56	0.11-0.17	0.01-0.24	-
Date Sampled:					21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	23-Jul-20	20-Jul-20	20-Jul-20	20-Jul-20	21-Jul-20	23-Jul-20	21-Jul-20	21-Jul-20
				Maximum															
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	47,000	6,100	20,000	27,000	14,000	23,000	25,000	13,000	13,000	21,000	24,000	18,000	34,000	25,000	16,000	18,000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	5.4	<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
Acid Extractable Arsenic (As)	mg/kg	2.0	31	3,900	**140**	**250**	**110**	31	**110**	**130**	**180**	**100**	**150**	**230**	**290**	**110**	20	**180**	**190**
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	82	9.3	49	24	24	41	27	19	33	73	82	62	26	34	42	43
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	2	<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
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	6	<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
Acid Extractable Boron (B)	mg/kg	50	24,000	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	49	7.3	25	33	18	28	29	18	16	30	32	26	26	34	23	24
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	36	1.2	11	4.3	1.8	7	5.7	3.4	6.5	29	36	10	2.2	5.4	14	13
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	61	3.1	15	4.9	3.1	9.8	11	10	7.7	31	27	12	4.9	6	30	33
Acid Extractable Iron (Fe)	mg/kg	50	144,000	67,000	16,000	31,000	55,000	31,000	31,000	33,000	30,000	21,000	33,000	34,000	29,000	32,000	47,000	28,000	29,000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	200	8.3	13	14	9.9	12	11	11	12	15	19	30	12	12	13	13
Acid Extractable Lithium (Li)	mg/kg	2.0	-	57	4.3	26	17	9.9	23	21	15	22	46	46	25	16	25	32	35
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	1,500	110	490	260	100	310	300	180	450	610	720	1200	110	260	450	460
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	40	0.11	0.15	0.17	0.14	0.13	0.12	0.12	<0.10	0.6	1.1	7.2	0.29	0.14	<0.10	<0.10
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<	<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
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	52	2.8	17	11	6.5	17	13	9.5	13	52	50	21	7.4	16	22	24
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	47	4.5	13	9.5	5.4	15	10	6.8	14	21	21	14	5.2	12	16	17
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	6.4	0.66	0.84	1.9	1.1	1.0	1.2	1.1	1.2	<0.50	0.64	1.1	2.5	1.7	<0.50	<0.50
Acid Extractable Silver (Ag)	mg/kg	0.50	490	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	16	<5.0	5.8	<5.0	5.9	6.1	<5.0	<5.0	7.2	11	15	16	8.5	7.2	5.5	6.5
Acid Extractable Thallium (Tl)	mg/kg	0.10	1	0.63	<0.10	0.16	0.13	<0.10	0.15	0.12	<0.10	0.24	0.27	0.35	0.21	<0.10	0.11	0.16	0.17
Acid Extractable Tin (Sn)	mg/kg	varies	122,000	1.6	<1.0	<1.0	1.2	1.6	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	8.5	0.33	0.62	0.68	0.48	0.61	0.71	0.54	1.1	1.5	1.3	1.2	0.58	0.66	0.75	0.88
Acid Extractable Vanadium (V)	mg/kg	2.0	160	76	27	42	70	67	42	48	35	26	33	35	24	41	66	24	25
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	140	9.6	49	33	22	46	40	28	34	110	120	77	28	41	52	56

Notes:

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Field Identified Tailings - "Impacted Soils"
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Field Identified Native Ground - "Non-Impacted Soils"

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Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	Sample Location:	TP20-45	TP20-46	TP20-47	TP20-48	TP20-49	TP20-50	TP20-51		TP20-52	TP20-53	TP20-54	TP20-55	TP20-57	TP20-58	TP20-59	TP20-60
				Sample Name:	TP20-45	TP20-46	TP20-47	TP20-48	TP20-49	TP20-50	TP20-51	TP20-DUP3	TP20-52	TP20-53	TP20-54	TP20-55	TP20-57	TP20-58	TP20-59	TP20-60
Soil description and nearby features:					Dark grey silt	Grey silt with organics, undisturbed	Dark grey-brown silty sand	Reddish brown silty clay	Light brown silt with sand	Brown silty sand	Brown silt and gravel	Dup of TP20-51	Grey silty sand	Reddish brown silty sand	Grey brown silt with some sand and slate gravel, possible waste rock	Natural soil	Brown sandy silt, grey seam at edge of reworked area	Natural soil, roots	Waste rock cobble at surface	Sandy silt
2020 Infrastructure Area:					Till stockpile	Road/Water management ditch	Till stockpile	Till stockpile	Till stockpile	Till stockpile	Organic material stockpile	Organic material stockpile	Organic material stockpile	Organic material stockpile	None	Road	Open pit	Open pit	Open pit	Open pit
Sample Depth (mbgs):					0.08-0.51	0.04-0.63	0.11-0.42	0.1.0-0.43	0.07-0.42	0.07-0.39	0.06-0.26	-	0.12-0.52	0.04-0.63	0.14-0.54	0.09-0.50	0.01-0.57	0.03-0.49	0.05-0.53	0.02-0.41
Date Sampled:					21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	21-Jul-20	23-Jul-20	21-Jul-20	20-Jul-20	20-Jul-20	20-Jul-20
				Maximum																
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	47,000	18,000	12,000	16,000	19,000	19,000	21,000	30,000	32,000	5,900	19,000	27,000	26,000	33,000	15,000	17,000	13,000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	5.4	<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
Acid Extractable Arsenic (As)	mg/kg	2.0	31	3,900	**130**	15	**180**	**270**	**250**	**200**	**120**	**120**	4.3	**260**	**130**	**210**	**140**	17	**1000**	**140**
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	82	25	15	26	20	26	26	39	36	14	32	22	25	40	16	45	34
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	2	<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
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	<2.0	<2.0	<2.0
Acid Extractable Boron (B)	mg/kg	50	24,000	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.38	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	49	27	12	16	22	22	19	29	29	8.5	22	26	35	41	16	24	20
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	36	13	2.5	3.2	3.3	7.2	4.3	23	28	2	5.5	3.9	2.9	10	2.4	15	7.5
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	61	10	4.1	7.1	6.7	12	10	10	11	2.3	14	6.2	19	18	5.8	33	21
Acid Extractable Iron (Fe)	mg/kg	50	144,000	67,000	30,000	18,000	27,000	31,000	31,000	28,000	46,000	47,000	6,900	32,000	24,000	57,000	40,000	22,000	35,000	28,000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	200	18	8.6	17	9.7	12	17	33	35	6.5	11	12	34	12	8.3	40	13
Acid Extractable Lithium (Li)	mg/kg	2.0	-	57	37	10	14	16	27	20	22	23	7.6	22	22	20	49	14	38	30
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	1,500	400	140	170	170	350	210	1300	1500	97	280	160	200	380	120	650	390
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	40	<0.10	<0.10	0.16	0.1	<0.10	0.2	0.33	0.36	<0.10	<0.10	0.13	0.1	<0.10	0.13	<0.10	<0.10
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<	<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
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	52	17	7.7	9.3	7.9	16	11	9.3	9.5	5.6	13	9.6	7.3	24	6.8	32	19
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	47	11	7.6	9.2	6.3	10	8.9	11	11	7.7	9.3	7.3	12	11	6.6	18	14
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	6.4	0.89	0.69	2.2	1.4	1	2	3.9	4.1	<0.50	1.2	1.6	1.9	0.95	0.98	<0.50	<0.50
Acid Extractable Silver (Ag)	mg/kg	0.50	490	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.69	<0.50	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	16	5.6	<5.0	6.6	<5.0	6.6	6.6	7.9	8.3	<5.0	5.8	5.3	<5.0	<5.0	5.5	12	9.8
Acid Extractable Thallium (Tl)	mg/kg	0.10	1	0.63	0.11	<0.10	0.13	0.1	0.12	0.11	0.18	0.18	<0.10	0.14	0.11	0.17	0.13	<0.10	0.17	0.12
Acid Extractable Tin (Sn)	mg/kg	varies	122,000	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	8.5	0.65	0.5	0.84	0.54	0.76	0.93	1.8	1.9	0.31	0.72	0.73	0.54	0.76	0.49	1.2	1
Acid Extractable Vanadium (V)	mg/kg	2.0	160	76	37	27	26	37	26	24	39	39	13	33	38	64	52	30	26	21
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	140	58	21	28	30	45	37	32	34	13	49	27	45	64	18	140	48

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Non-Potable site; coarse-grained soil, industrial land use. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A
RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
- = no standard available, not applicable
NAG = Non-Acid Generating
PAG = Potentially Acid-Generating
TSSP = Top-Soil/Sub-Soil Stockpile

38 = Exceeds NSE Tier 1 EQS

Field Identified Tailings - "Impacted Soils"
Field Identified Waste Rock/Old Mine Workings - "Impacted Soils"
Field Identified Native Ground - "Non-Impacted Soils"

TABLE C-1 **SOIL METALS CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	Sample Location:	TP20-61	TP20-62	TP20-63	TP20-64	TP20-65		TP20-100		TP20-101A	TP20-101B	TP20-102	TP20-104	TP19-01	TP19-02
				Sample Name:	TP20-61	TP20-62	TP20-63	TP20-64	TP20-65	TP20-DUP6	TP20-100	TP20-DUP4	TP20-101A	TP20-101B	TP20-102	TP20-104	SA1	SA2
Soil description and nearby features:					Light brown silty sand with sub-angular gravel, forested area	Undisturbed soil	Possible tailings adjacent to brook	Brown-grey uniform silt, possible tailings adjacent to brook	Suspect tailings near waste rock	Dup of TP20-65	Suspected tailings north of old stamp mill	Dup of TP20-100	Suspect tailings in suspect tailings area near brook	Suspect tailings in suspect tailings area near brook	Tailings deposit edge	Supsect tailings at berm between Crusher lake and DNR identified tailings storage area	Poorly graded black to brown silty SAND with cobbles Possible waste rock	Poorly graded brown silty SAND with cobbles
2020 Infrastructure Area:					TSSP	Low grade stockpile	None	None	None	None	None	None	None	None	None	None	Open pit	None
Sample Depth (mbgs):					0.11-0.57	0.13-0.60	0.10-0.45	0.12-0.65	0.10-0.75	-	0.03-0.39	-	0.12-0.40	0.40-0.60	0.08-0.50	-	0-0.25	Side of bank
Date Sampled:					21-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	23-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	22-Jul-20	28-Jul-20	10-Jul-19	10-Jul-19
				Maximum														
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	47,000	27,000	39,000	8,700	11,000	6,800	5,900	13,000	14,000	12,000	14,000	28,000	20,000	24000	27000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	5.4	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	5.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Arsenic (As)	mg/kg	2.0	31	3,900	31	31	**480**	9.1	**200**	**160**	**890**	**850**	**260**	**740**	**40**	14	**360**	**210**
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	82	35	44	17	18	21	18	43	45	30	35	32	43	43	30
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	2	<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
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.3	4.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Boron (B)	mg/kg	50	24,000	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	49	26	43	14	16	10	9	20	21	20	19	37	38	35	31
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	36	7.7	5.4	2.1	1.7	<1.0	<1.0	3	3.1	2.5	8.1	12	7.7	8.5	9.6
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	61	12	13	58	6.4	8.3	6.9	16	16	61	53	8.5	3.3	40	26
Acid Extractable Iron (Fe)	mg/kg	50	144,000	67,000	29,000	27,000	17,000	14,000	13,000	12,000	33,000	34,000	22,000	25,000	50,000	32,000	55000	36000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	200	11	13	25	13	16	11	200	190	34	45	11	6.1	27	15
Acid Extractable Lithium (Li)	mg/kg	2.0	-	57	29	35	12	14	10	8.3	29	31	19	23	37	27	36	35
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	1,500	300	180	180	170	130	110	260	270	230	250	440	280	530	370
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	40	0.1	0.22	20	13	15	17	40	39	9	36	0.56	<0.10	0.11	0.13
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<	<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
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	52	17	14	6.3	4.6	2.7	2.1	5.5	5.7	7.9	19	23	19	16	21
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	47	12	11	12	8.2	11	10	32	34	23	26	12	15	33	14
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	6.4	1.3	2.3	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	<0.50	0.51	<0.50	<1.0	<1.0
Acid Extractable Silver (Ag)	mg/kg	0.50	490	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.2	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	16	5.8	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.5	<5.0	<5.0	<5.0
Acid Extractable Thallium (Tl)	mg/kg	0.10	1	0.63	0.16	0.13	0.13	<0.10	0.13	0.11	0.62	0.63	0.2	0.28	0.13	0.11	0.27	0.15
Acid Extractable Tin (Sn)	mg/kg	varies	122,000	1.6	<1.0	1.4	<1.0	<1.0	1.4	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	8.5	0.83	0.8	0.24	0.34	0.17	0.13	0.21	0.21	0.33	0.29	0.67	0.46	0.89	0.92
Acid Extractable Vanadium (V)	mg/kg	2.0	160	76	29	67	15	17	11	10	25	26	22	22	41	54	36	37
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	140	49	37	32	33	25	25	44	77	44	58	83	51	88	56

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Non-Potable site; coarse-grained soil, industrial land use. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A
RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
- = no standard available, not applicable
NAG = Non-Acid Generating
PAG = Potentially Acid-Generating
TSSP = Top-Soil/Sub-Soil Stockpile

38 = Exceeds NSE Tier 1 EQS

Field Identified Tailings - "Impacted Soils"
Field Identified Waste Rock/Old Mine Workings - "Impacted Soils"
Field Identified Native Ground - "Non-Impacted Soils"

TABLE C-1 **SOIL METALS CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	Sample Location:	TP19-03	TP19-04	TP19-05	TP19-06	TP19-07	TP19-08	TP19-09	TP19-10	TP19-11	TP19-12	TP19-13	TP19-14	TP19-15	TP19-16	
				Sample Name:	SA3	SA4	SA5	SA6	SA7	SA8	SA9	SA10	SA11	SA12	SA13	SA14	SA15	SA16	DUP1
Soil description and nearby features:					Firm poorly graded grey to brown silty SAND with gravel and cobbles. Moist Possible waste rock	Firm poorly graded grey to brown silty SAND with gravel and cobbles. Moist	Firm poorly graded brown silty SAND with gravel and cobbles. Moist	Firm silty SAND. Wet Possible tailings	Firm poorly graded brown to grey silty SAND with gravel and cobbles. Dry Possible waste rock	Firm poorly graded brown silty SAND with gravel and cobbles. Dry Possible waste rock	ROOTMAT firm poorly graded brown to grey silty SAND. Dry	Firm poorly graded brown silty SAND with gravel and cobbles. Dry	Firm poorly graded brown silty SAND with gravel and cobbles. Dry	Grey SILT Possible tailings	Firm grey silty SAND Trace gravel. Moist Possible tailings	Firm sandy SILT with grass roots. Moist Possible tailings	Black ORGANICS with firm grey sandy silt Moist Possible tailings	Firm poorly graded grey silty SAND with gravel and cobbles. Moist	Dup of TP19-16
2020 Infrastructure Area:					Road	Till stockpile	Open pit	Open pit	Open pit	Open pit	TSSP	Open pit	None	None	None	None	None	NAG stockpile	NAG stockpile
Sample Depth (mbgs):					0-0.30	0-0.40	0-0.30	0-0.30	0-0.30	0-0.45	0-0.30	0-0.35	0-0.30	0-0.40	0-0.25	0-0.40	0-0.30		DUP1
Date Sampled:					10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19
				Maximum															
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	47,000	14000	18000	23000	15000	23000	31000	11000	30000	37000	4600	22000	22000	20000	21000	20000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	5.4	<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
Acid Extractable Arsenic (As)	mg/kg	2.0	31	3,900	**140**	**160**	**420**	**250**	**820**	**660**	**89**	25	**130**	**42**	**51**	**360**	**78**	15	14
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	82	39	34	46	56	51	37	17	28	30	6.3	69	78	110	57	44
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	2	<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
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.9	<2.0	<2.0	<2.0
Acid Extractable Boron (B)	mg/kg	50	24,000	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	49	22	25	31	28	44	47	18	30	43	7.1	33	33	45	25	23
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	36	11	7.7	14	9.7	11	9.6	1.8	5.8	7.9	<1.0	27	4.3	14	12	11
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	61	22	7.0	33	35	39	42	4.1	14	27	7.4	65	16	38	22	16
Acid Extractable Iron (Fe)	mg/kg	50	144,000	67,000	26000	26000	32000	33000	43000	45000	30000	38000	45000	7200	37000	41000	35000	32000	30000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	200	9.6	10	16	15	110	12	17	15	13	8.2	12	58	7.2	17	16
Acid Extractable Lithium (Li)	mg/kg	2.0	-	57	32	29	37	36	34	32	7.1	31	34	6.1	45	48	44	36	32
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	1,500	410	510	560	530	460	400	120	310	330	97	520	410	480	740	640
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	40	<0.10	0.12	0.12	<0.10	<0.10	0.11	0.16	0.14	0.23	7.3	0.14	15	0.14	0.13	<0.10
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<	<2.0	<2.0	<2.0	2.1	<2.0	17	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.7	<2.0	<2.0
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	52	20	14	25	24	24	21	5.1	14	21	<2.0	38	8.2	29	23	18
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	47	16	12	18	20	21	17	3.3	12	12	3.9	36	59	48	18	16
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	6.4	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	1.1	1.7	2.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acid Extractable Silver (Ag)	mg/kg	0.50	490	1.2	<0.50	<0.50	<0.50	1.4	<0.50	5.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	16	5.7	8.0	5.9	10	5.8	<5.0	<5.0	6.7	<5.0	<5.0	8.2	<5.0	11	10	8.7
Acid Extractable Thallium (Tl)	mg/kg	0.10	1	0.63	0.15	<0.10	0.18	0.15	0.24	0.19	<0.10	0.14	0.16	<0.10	0.37	0.45	0.30	0.16	0.16
Acid Extractable Tin (Sn)	mg/kg	varies	122,000	1.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	8.5	0.84	0.71	0.93	1.3	0.85	0.78	0.43	0.90	0.89	0.14	2.3	0.38	0.87	1.2	1.0
Acid Extractable Vanadium (V)	mg/kg	2.0	160	76	24	37	35	25	31	43	58	38	46	8.1	40	39	43	27	27
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	140	46	48	64	59	78	73	28	44	74	15	100	69	65	57	50

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Non-Potable site; coarse-grained soil, industrial land use. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A
RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
- = no standard available, not applicable
NAG = Non-Acid Generating
PAG = Potentially Acid-Generating
TSSP = Top-Soil/Sub-Soil Stockpile

38 = Exceeds NSE Tier 1 EQS

Field Identified Tailings - "Impacted Soils"
Field Identified Waste Rock/Old Mine Workings - "Impacted Soils"
Field Identified Native Ground - "Non-Impacted Soils"

TABLE C-1 **SOIL METALS CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	Sample Location:	TP19-17	TP19-18	TP19-19	TP19-20	TP19-21	TP19-22	TP19-23	TP19-24	TP19-25	TP19-26	TP19-27	TP19-28	TP19-29
				Sample Name:	SA17	SA18	SA19	SA20	SA21	SA22	SA23	SA24	SA25	SA26	SA27	SA28	SA29
Soil description and nearby features:					Firm poorly graded reddish brown silty SAND with gravel. Dry	Firm poorly graded brown silty SAND with gravel. Dry	Firm poorly graded grey silty SAND with cobbles. Wet	Firm poorly graded brown silty SAND with gravel and cobbles. Dry	Firm poorly graded brown to grey silty SAND with gravel. Dry	Firm poorly graded brown silty SAND with gravel. Moist	Firm poorly graded brown silty SAND with gravel. Dry	Firm brown silty SAND with gravel. Dry	Firm brown silty SAND with gravel. Dry	Firm brown to grey SILT Moist Possible tailings	Firm brown SILT Moist Possible tailings	Firm grey SILT Wet Possible tailings	Firm poorly graded brown silty SAND with gravel and cobbles. Wet
2020 Infrastructure Area:					Low grade stockpile	None	None	Till stockpile	Organic material stockpile	None	PAG stockpile	Crusher pad	TSSP	Open pit	Open pit	Open pit	Open pit
Sample Depth (mbgs):					0-0.30	0-0.35	0-0.40	0-0.30	0-0.30	0-0.40	0-0.35	0-0.30	0-0.35	0-0.35	0-0.40	0-0.15	0-0.20
Date Sampled:					11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	12-Jul-19	12-Jul-19	12-Jul-19	12-Jul-19
				Maximum													
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	47,000	47000	33000	13000	21000	7800	25000	28000	21000	25000	16000	16000	18000	16000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	5.4	<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
Acid Extractable Arsenic (As)	mg/kg	2.0	31	3,900	6.9	13	**69**	**190**	**82**	**43**	**34**	**75**	**140**	**110**	**74**	**3,900**	**130**
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	82	28	31	21	32	11	29	30	21	33	36	34	42	41
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	2	<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
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	6	<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
Acid Extractable Boron (B)	mg/kg	50	24,000	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	49	42	37	16	26	8.8	25	31	23	27	21	19	66	24
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	36	4.0	8.1	4.8	6.1	<1.0	4.3	7.4	3.2	5.6	7.1	4.5	18	7.8
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	61	6.7	20	4.2	9.2	2.8	7.9	11	7.1	17	11	9.0	91	31
Acid Extractable Iron (Fe)	mg/kg	50	144,000	67,000	47000	41000	19000	32000	21000	29000	36000	31000	38000	27000	23000	40000	26000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	200	13	14	9.3	11	9.7	13	15	14	14	19	15	34	19
Acid Extractable Lithium (Li)	mg/kg	2.0	-	57	26	41	23	27	3.9	23	33	18	29	26	21	69	36
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	1,500	150	310	260	310	86	200	510	160	310	360	270	660	440
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	40	0.29	0.12	0.11	0.13	0.15	0.20	0.18	0.19	0.18	<0.10	0.14	<0.10	<0.10
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.9	<2.0
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	52	10	20	9.8	15	3.1	11	16	8.6	16	14	11	38	23
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	47	9.4	16	9.0	12	6.9	9.9	11	7.2	9.1	12	10	16	16
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	6.4	2.4	1.5	<1.0	1.3	<1.0	1.9	1.5	1.4	1.6	<1.0	<1.0	<1.0	<1.0
Acid Extractable Silver (Ag)	mg/kg	0.50	490	1.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	27	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	16	<5.0	<5.0	5.4	5.6	<5.0	5.4	<5.0	<5.0	8.1	7.3	6.9	27	9.2
Acid Extractable Thallium (Tl)	mg/kg	0.10	1	0.63	0.11	0.17	0.12	0.12	0.13	0.14	0.17	0.13	0.14	0.12	0.11	0.24	0.19
Acid Extractable Tin (Sn)	mg/kg	varies	122,000	1.6	1.7	<1.0	<1.0	<1.0	1.0	<1.0	1.1	1.2	<1.0	<1.0	<1.0	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	8.5	0.90	1.1	0.54	0.75	0.45	0.83	0.68	0.58	0.68	0.68	0.61	0.94	0.90
Acid Extractable Vanadium (V)	mg/kg	2.0	160	76	83	43	24	35	32	38	49	45	31	30	29	33	28
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	140	32	51	33	43	11	32	50	26	52	45	35	79	60

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Non-Potable site; coarse-grained soil, industrial land use. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A
RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
- = no standard available, not applicable
NAG = Non-Acid Generating
PAG = Potentially Acid-Generating
TSSP = Top-Soil/Sub-Soil Stockpile

38 = Exceeds NSE Tier 1 EQS

Field Identified Tailings - "Impacted Soils"
Field Identified Waste Rock/Old Mine Workings - "Impacted Soils"
Field Identified Native Ground - "Non-Impacted Soils"

TABLE C-2 SEDIMENT METALS CHEMISTRY
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS[1] (mg/kg)	ISQG[2] (mg/kg)	PEL[3] (mg/kg)	Sample Location:	SS20-01	SS20-02B	SS20-03B	SS20-04		SS20-05	SS20-06	SS20-07	SS20-08	SS20-09	SS20-11	SS20-14	SS20-15	SS20-16
						Sample Name:	SS20-01	SS20-02B	SS20-03B	SS20-04	SS20-DUP6	SS20-05	SS20-06	SS20-07	SS20-08	SS20-09	SS20-11	SS20-14	SS20-15	SS20-16
						Date Sampled:	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	29-Jul-20	29-Jul-20	29-Jul-20	29-Jul-20
						Maximum														
Acid Extractable Aluminum (Al)	mg/kg	10	-	-	-	34,000	23,000	21,000	21,000	21,000	21,000	17,000	34,000	22,000	14,000	9,100	8,000	23,000	23,000	17,000
Acid Extractable Antimony (Sb)	mg/kg	2	25	-	-	2.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Arsenic (As)	mg/kg	2	17	5.90	17.00	2,800	**450**	**570**	**560**	**110**	**120**	**180**	**42**	**2,800**	**38**	3.1	7.1	**75**	4.5	5.1
Acid Extractable Barium (Ba)	mg/kg	5	-	-	-	1,300	84	43	93	25	26	120	61	1,300	35	23	35	44	64	37
Acid Extractable Beryllium (Be)	mg/kg	2	-	-	-	<	<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
Acid Extractable Bismuth (Bi)	mg/kg	2	-	-	-	2	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Boron (B)	mg/kg	50	-	-	-	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.3	3.5	0.60	3.50	5	0.92	<0.30	**5.0**	<0.30	<0.30	<0.30	0.54	1.9	<0.30	<0.30	0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2	90	37.30	90.00	56	56	29	30	24	24	24	42	6.7	21	12	8.0	31	32	21
Acid Extractable Cobalt (Co)	mg/kg	1	-	-	-	1,500	30	15	20	4.4	4.5	9.8	22	1,500	7.9	2.8	2.3	6.2	8.3	4.5
Acid Extractable Copper (Cu)	mg/kg	2	197	35.70	197.00	75	62	75	43	11	9.9	16	27	12	13	<2.0	12	17	12	6.9
Acid Extractable Iron (Fe)	mg/kg	50	43,766	-	-	200,000	38,000	42,000	42,000	28,000	28,000	23,000	**55,000**	**200,000**	22,000	9,800	4,300	24,000	22,000	14,000
Acid Extractable Lead (Pb)	mg/kg	0.5	91.3	35.00	91.30	410	50	71	**410**	12	12	9.7	4.3	**340**	10	8.0	13	17	7.8	8.4
Acid Extractable Lithium (Li)	mg/kg	2	-	-	-	67	39	32	40	19	21	30	67	16	30	9.6	3.0	27	36	19
Acid Extractable Manganese (Mn)	mg/kg	2	1,100	-	-	290,000	850	440	990	230	250	360	670	**290,000**	340	120	89	240	260	170
Acid Extractable Mercury (Hg)	mg/kg	0.1	0.486	0.17	0.486	7.5	**0.77**	**7.5**	0.31	0.15	0.12	<0.10	<0.10	0.11	<0.10	<0.10	0.20	0.13	<0.10	0.12
Acid Extractable Molybdenum (Mo)	mg/kg	2	-	-	-	43	7.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	43	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Nickel (Ni)	mg/kg	2	75	-	-	65	65	37	42	11	12	20	53	40	18	6.8	9.5	16	20	11
Acid Extractable Rubidium (Rb)	mg/kg	2	-	-	-	34	15	34	28	7.9	9.0	14	10	3.1	13	6.2	2.2	14	19	9.7
Acid Extractable Selenium (Se)	mg/kg	1	2	-	-	2.4	1.5	<0.50	0.55	1.2	1.2	<0.50	0.68	1.3	<0.50	<0.50	**2.4**	1.2	0.64	1.5
Acid Extractable Silver (Ag)	mg/kg	0.5	-	-	-	8.2	8.2	0.64	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5	1	-	-	39	**39**	**7.9**	**39**	**7.7**	**7.2**	**8.7**	**12**	<5.0	**10**	**6.3**	**17**	**7.1**	<5.0	**5.3**
Acid Extractable Thallium (Tl)	mg/kg	0.1	-	-	-	14	0.25	0.38	0.26	0.11	0.11	0.12	0.32	14	0.11	0.10	<0.10	0.16	0.15	<0.10
Acid Extractable Tin (Sn)	mg/kg	1	-	-	-	1.1	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1.1	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.1	-	-	-	2.0	2.0	0.64	1.3	0.63	0.63	0.73	1.6	0.94	0.73	0.42	0.83	0.65	1.1	0.83
Acid Extractable Vanadium (V)	mg/kg	2	-	-	-	340	34	31	33	43	41	27	42	340	23	14	5.8	42	37	22
Acid Extractable Zinc (Zn)	mg/kg	5	315	123.00	315.00	1,000	200	100	**1,000**	44	37	54	150	88	48	26	24	53	48	34

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for freshwater sediment. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 2
2. ISQG = interim sediment quality guideline (Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic life)
3. PEL = probable effect level (Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic life)

RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
- = no standard available, not applicable
Lab-Dup = laboratory QA/QC duplicate

38	= Exceeds ISQG
40	= Exceeds PEL or Tier 1 EQS

TABLE C-3 **SEDIMENT PETROLEUM HYDROCARBON CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1] (mg/kg)	ISQG[3] (mg/kg)	PEL[4] (mg/kg)	SS20-03B
					Date Sampled:	28-Jul-20
Benzene	mg/kg	0.025	1.2	-	-	<0.025
Toluene	mg/kg	0.050	1.4	-	-	<0.050
Ethylbenzene	mg/kg	0.025	1.2	-	-	<0.025
Total Xylenes	mg/kg	0.050	1.3	-	-	<0.050
C6 - C10 (less BTEX)	mg/kg	2.5	-	-	-	<2.5
>C10-C16 Hydrocarbons	mg/kg	10	-	-	-	520
>C16-C21 Hydrocarbons	mg/kg	10	-	-	-	390
>C21-<C32 Hydrocarbons	mg/kg	15	-	-	-	1900
Modified TPH (Tier 1)	mg/kg	15	15 (Gas) 25 (Fuel) 43 (Lube)	-	-	**2800**
Hydrocarbon Resemblance	-	-	-	-	-	Weathered fuel oil fraction. Lube oil fraction.

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for freshwater sediment. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 2
2. ISQG = interim sediment quality guideline (Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic life)
3. PEL = probable effect level (Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic life)

<# = parameter not detected above RDL shown
- = no standard available, not applicable
Lab-Dup = laboratory QA/QC duplicate
40 = Exceeds Atlantic RBCA or Tier 1 EQS

TABLE C-4 **SURFACE WATER METALS CHEMISTRY**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	MDMER[2]			Sample Location:	SW20-01	SW20-02	SW20-03	SW20-04	SW20-05	SW19-01	SW19-02	SW19-03	SW19-04	
				Monthly Mean	Composite Sample	Grab Sample	Sample Name:	SW20-01	SW20-02	SW20-03	SW20-04	SW20-05	SW1	SW2	SW3	SW4	DUP2
							Water Body:	Cameron Flowage	Cameron Flowage	Killag River (northwest of Site)	Killag River (east of Site)	Crusher Lake	Settling pond	Stream north of Crusher Lake	Stream south of Crusher Lake	Cameron Flowage	Cameron Flowage
							Date Sampled:	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	28-Jul-20	10-Jul-19	10-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19
							Maximum										
Total Aluminum (Al)	µg/L	5.0	5	-	-	-	280	**280**	**46**	**270**	**260**	**280**	**41**	**280**	**170**	**280**	**280**
Total Antimony (Sb)	µg/L	1.0	20	-	-	-	<	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Arsenic (As)	µg/L	1.0	5.0	100	150	200	45	4.5	**45**	1.5	4.4	2.1	**32**	4.3	<1.0	4.6	4.7
Total Barium (Ba)	µg/L	1.0	1,000	-	-	-	4.8	4.8	4.1	3.5	3.4	3.0	3.7	2.4	5.5	3.0	3.0
Total Beryllium (Be)	µg/L	1.0	5.3	-	-	-	<	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Bismuth (Bi)	µg/L	2.0	-	-	-	-	<	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Boron (B)	µg/L	50	1,200	-	-	-	<	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Total Cadmium (Cd)	µg/L	0.010	0.010	-	-	-	0.016	**0.014**	<0.010	**0.016**	**0.015**	**0.014**	<0.010	**0.013**	**0.014**	**0.013**	**0.017**
Total Calcium (Ca)	µg/L	100	-	-	-	-	3000	1,000	3,000	730	820	810	3600	580	1100	670	710
Total Chromium (Cr)	µg/L	1.0	1.0	-	-	-	0.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	**5.7**
Total Cobalt (Co)	µg/L	0.40	10	-	-	-	0.00	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.74	<0.40	<0.40
Total Copper (Cu)	µg/L	0.50	2	100	150	200	0.8	0.53	0.54	<0.50	0.80	0.54	1.4	0.51	<0.50	<0.50	0.59
Total Iron (Fe)	µg/L	50	300	-	-	-	1000	**740**	**1,000**	**780**	**680**	**710**	**690**	**750**	**1700**	**660**	**730**
Total Lead (Pb)	µg/L	0.50	1	80	120	160	0.50	<0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Magnesium (Mg)	µg/L	100	-	-	-	-	650	400	650	370	380	340	650	270	430	300	310
Total Manganese (Mn)	µg/L	2.0	820	-	-	-	110	50	110	41	44	29	67	43	69	43	46
Total Mercury (Hg)	µg/L	0.013	0.026	-	-	-	0.0000	<0.013	<0.013	<0.013	<0.013	<0.013	<0.0020	<0.0020	0.0027	<0.0020	<0.0020
Total Molybdenum (Mo)	µg/L	2.0	73	-	-	-	<	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Nickel (Ni)	µg/L	2.0	25	250	380	500	0.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.2
Total Phosphorus (P)	µg/L	100	-	-	-	-	<	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Total Potassium (K)	µg/L	100	-	-	-	-	400	190	400	160	180	210	530	130	380	100	<100
Total Selenium (Se)	µg/L	0.50	1.0	-	-	-	<	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0
Total Silver (Ag)	µg/L	0.10	0.1	-	-	-	<	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Sodium (Na)	µg/L	100	-	-	-	-	2400	2,400	1,700	2,300	2,300	2,100	1800	1900	2500	1900	2000
Total Strontium (Sr)	µg/L	2.0	21,000	-	-	-	20	8.0	20	6.2	7.3	5.6	18	4.2	8.4	5.8	6.4
Total Thallium (Tl)	µg/L	0.10	0.8	-	-	-	<	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Tin (Sn)	µg/L	2.0	-	-	-	-	<	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Titanium (Ti)	µg/L	2.0	-	-	-	-	3.8	3.8	2.2	2.8	3.0	3.1	<2.0	2.4	2.0	3.3	2.6
Total Uranium (U)	µg/L	0.10	300	-	-	-	<	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Vanadium (V)	µg/L	2.0	6	-	-	-	<	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Zinc (Zn)	µg/L	5.0	30	400	600	800	26	26	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for freshwater surface water. From Nova Scotia's Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 3
2. MDMER = Metal and Diamond Mining Effluent Regulations SOR/2002-222, updated Schedule 4: Maximum Authorized Concentration of Prescribed Deleterious Substances (Table 1, applicable to new or reopening mines on or after June 1, 2020)

<# = parameter not detected above RDL shown
- = no standard available, not applicable
Lab-Dup = laboratory QA/QC duplicate

38	= Exceeds NSE Tier 1 EQS
38	= Exceeds MDMER

TABLE C-5 **SOIL RELATIVE PERCENT DIFFERENCES OF DUPLICATES (2020)**
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	TP20-13		RPD	TP20-39		RPD	TP20-44		RPD	TP20-51		RPD	TP20-65		RPD	TP20-100		RPD
			TP20-13	TP20-DUP5		TP20-39	TP20-DUP1		TP20-44	TP20-DUP-2		TP20-51	TP20-DUP3		TP20-65	TP20-DUP6		TP20-100	TP20-DUP4	
Date Sampled:			22-Jul-20	22-Jul-20		20-Jul-20	20-Jul-20		21-Jul-20	21-Jul-20		21-Jul-20	21-Jul-20		23-Jul-20	22-Jul-20		22-Jul-20	22-Jul-20	
Acid Extractable Aluminum (Al)	mg/kg	10	41,000	41,000	0%	21,000	24,000	13%	16,000	18,000	12%	30,000	32,000	6%	6,800	5,900	14%	13,000	14,000	7%
Acid Extractable Antimony (Sb)	mg/kg	2.0	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	2.1	NC	<2.0	5.4	NC
Acid Extractable Arsenic (As)	mg/kg	2.0	40	44	10%	150	230	42%	180	190	5%	120	120	0%	200	160	22%	890	850	5%
Acid Extractable Barium (Ba)	mg/kg	5.0	32	32	0%	73	82	12%	42	43	2%	39	36	8%	21	18	15%	43	45	5%
Acid Extractable Beryllium (Be)	mg/kg	2.0	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC
Acid Extractable Bismuth (Bi)	mg/kg	2.0	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	4.3	4.6	7%
Acid Extractable Boron (B)	mg/kg	50	<50	<50	NC	<50	<50	NC	<50	<50	NC	<50	<50	NC	<50	<50	NC	<50	<50	NC
Acid Extractable Cadmium (Cd)	mg/kg	0.30	<0.30	<0.30	NC	<0.30	<0.30	NC	<0.30	<0.30	NC	<0.30	<0.30	NC	<0.30	<0.30	NC	<0.30	<0.30	NC
Acid Extractable Chromium (Cr)	mg/kg	2.0	39	39	0%	30	32	6%	23	24	4%	29	29	0%	10	9	11%	20	21	5%
Acid Extractable Cobalt (Co)	mg/kg	1.0	8.0	8.3	4%	29	36	22%	14	13	7%	23	28	20%	<1.0	<1.0	NC	3	3.1	3%
Acid Extractable Copper (Cu)	mg/kg	2.0	19	21	10%	31	27	14%	30	33	10%	10	11	10%	8.3	6.9	18%	16	16	0%
Acid Extractable Iron (Fe)	mg/kg	50	40,000	43,000	7%	33,000	34,000	3%	28,000	29,000	4%	46,000	47,000	2%	13,000	12,000	8%	33,000	34,000	3%
Acid Extractable Lead (Pb)	mg/kg	0.50	16	16	0%	15	19	24%	13	13	0%	33	35	6%	16	11	37%	200	190	5%
Acid Extractable Lithium (Li)	mg/kg	2.0	26	27	4%	46	46	0%	32	35	9%	22	23	4%	10	8.3	19%	29	31	7%
Acid Extractable Manganese (Mn)	mg/kg	2.0	410	410	0%	610	720	17%	450	460	2%	1300	1500	14%	130	110	17%	260	270	4%
Acid Extractable Mercury (Hg)	mg/kg	0.10	0.23	0.26	12%	0.6	1.1	59%	<0.10	<0.10	NC	0.33	0.36	9%	15	17	13%	40	39	3%
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC	<2.0	<2.0	NC
Acid Extractable Nickel (Ni)	mg/kg	2.0	17	18	6%	52	50	4%	22	24	9%	9.3	9.5	2%	2.7	2.1	25%	5.5	5.7	4%
Acid Extractable Rubidium (Rb)	mg/kg	2.0	10	10	0%	21	21	0%	16	17	6%	11	11	0%	11	10	10%	32	34	6%
Acid Extractable Selenium (Se)	mg/kg	1.0	2.0	2.0	0%	<0.50	0.64	NC	<0.50	<0.50	NC	3.9	4.1	5%	<0.50	<0.50	NC	0.54	<0.50	NC
Acid Extractable Silver (Ag)	mg/kg	0.50	<0.50	<0.50	NC	<0.50	<0.50	NC	<0.50	<0.50	NC	<0.50	<0.50	NC	<0.50	<0.50	NC	1.2	1.2	0%
Acid Extractable Strontium (Sr)	mg/kg	5.0	5.5	<5.0	NC	11	15	31%	5.5	6.5	17%	7.9	8.3	5%	<5.0	<5.0	NC	<5.0	<5.0	NC
Acid Extractable Thallium (Tl)	mg/kg	0.10	0.18	0.16	12%	0.27	0.35	26%	0.16	0.17	6%	0.18	0.18	0%	0.13	0.11	17%	0.62	0.63	2%
Acid Extractable Tin (Sn)	mg/kg	varies	<1.0	<1.0	NC	<1.0	<1.0	NC	<1.0	<1.0	NC	<1.0	<1.0	NC	1.4	1.3	7%	<1.0	<1.0	NC
Acid Extractable Uranium (U)	mg/kg	0.10	0.91	0.88	3%	1.5	1.3	14%	0.75	0.88	16%	1.8	1.9	5%	0.17	0.13	27%	0.21	0.21	0%
Acid Extractable Vanadium (V)	mg/kg	2.0	47	49	4%	33	35	6%	24	25	4%	39	39	0%	11	10	10%	25	26	4%
Acid Extractable Zinc (Zn)	mg/kg	5.0	56	55	2%	110	120	9%	52	56	7%	32	34	6%	25	25	0%	44	77	55%

Notes:
RPD = Relative Percent Difference
RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
NC = RPD not calculated
99% = RPD exceeds 60%

TABLE C-6 SEDIMENT RELATIVE PERCENT DIFFERENCES OF DUPLICATES (2020)
Atlantic Mining NS Inc.
Beaver Dam, NS
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	SS20-04		RPD
			SS20-04	SS20-DUP6	
		Date Sampled:	28-Jul-20	28-Jul-20	
Acid Extractable Aluminum (Al)	mg/kg	10	21,000	21,000	0%
Acid Extractable Antimony (Sb)	mg/kg	2	<2.0	<2.0	NC
Acid Extractable Arsenic (As)	mg/kg	2	110	120	9%
Acid Extractable Barium (Ba)	mg/kg	5	25	26	4%
Acid Extractable Beryllium (Be)	mg/kg	2	<2.0	<2.0	NC
Acid Extractable Bismuth (Bi)	mg/kg	2	<2.0	<2.0	NC
Acid Extractable Boron (B)	mg/kg	50	<50	<50	NC
Acid Extractable Cadmium (Cd)	mg/kg	0.3	<0.30	<0.30	NC
Acid Extractable Chromium (Cr)	mg/kg	2	24	24	0%
Acid Extractable Cobalt (Co)	mg/kg	1	4.4	4.5	2%
Acid Extractable Copper (Cu)	mg/kg	2	11	9.9	11%
Acid Extractable Iron (Fe)	mg/kg	50	28,000	28,000	0%
Acid Extractable Lead (Pb)	mg/kg	0.5	12	12	0%
Acid Extractable Lithium (Li)	mg/kg	2	19	21	10%
Acid Extractable Manganese (Mn)	mg/kg	2	230	250	8%
Acid Extractable Mercury (Hg)	mg/kg	0.1	0.15	0.12	22%
Acid Extractable Molybdenum (Mo)	mg/kg	2	<2.0	<2.0	NC
Acid Extractable Nickel (Ni)	mg/kg	2	11	12	9%
Acid Extractable Rubidium (Rb)	mg/kg	2	7.9	9.0	13%
Acid Extractable Selenium (Se)	mg/kg	1	1.2	1.2	0%
Acid Extractable Silver (Ag)	mg/kg	0.5	<0.50	<0.50	NC
Acid Extractable Strontium (Sr)	mg/kg	5	7.7	7.2	7%
Acid Extractable Thallium (Tl)	mg/kg	0.1	0.11	0.11	0%
Acid Extractable Tin (Sn)	mg/kg	1	<1.0	<1.0	NC
Acid Extractable Uranium (U)	mg/kg	0.1	0.63	0.63	0%
Acid Extractable Vanadium (V)	mg/kg	2	43	41	5%
Acid Extractable Zinc (Zn)	mg/kg	5	44	37	17%

Notes:
RPD = Relative Percent Difference
RDL = laboratory's reportable detection limit
<# = parameter not detected above RDL shown
NC = RPD not calculated
99% = RPD exceeds 60%

APPENDIX D

Laboratory Certificates of Analysis

Your Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Your C.O.C. #: D40299, 48081, 48082, 48080

Attention: Gillian Manley

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Report Date: 2020/07/30
Report #: R6267176
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0I5405
Received: 2020/07/22, 14:23

Sample Matrix: Soil
Samples Received: 36

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Metals Solids Acid Extr. ICPMS	16	2020/07/27	2020/07/28	ATL SOP 00058	EPA 6020B R2 m
Metals Solids Acid Extr. ICPMS	18	2020/07/28	2020/07/28	ATL SOP 00058	EPA 6020B R2 m
Metals Solids Acid Extr. ICPMS	2	2020/07/28	2020/07/29	ATL SOP 00058	EPA 6020B R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs 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 BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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.

Your Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Your C.O.C. #: D40299, 48081, 48082, 48080

Attention: Gillian Manley

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Report Date: 2020/07/30
Report #: R6267176
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0I5405
Received: 2020/07/22, 14:23

Encryption Key

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

==========

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

BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NEM354		NEM355	NEM356	NEM357	NEM358	NEM360		
Sampling Date		2020/07/20		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/20		
COC Number		D40299		D40299	D40299	D40299	D40299	D40299		
	UNITS	**TP20-06**	**RDL**	**TP20-07**	**TP20-08**	**TP20-09**	**TP20-10**	**TP20-29**	**RDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	19000	10	13000	3700	27000	26000	27000	10	6858501
Acid Extractable Antimony (Sb)	mg/kg	<2.0	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Arsenic (As)	mg/kg	2800	20	62	8.1	53	71	230	2.0	6858501
Acid Extractable Barium (Ba)	mg/kg	29	5.0	13	5.2	30	25	43	5.0	6858501
Acid Extractable Beryllium (Be)	mg/kg	<2.0	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Boron (B)	mg/kg	<50	50	<50	<50	<50	<50	<50	50	6858501
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6858501
Acid Extractable Chromium (Cr)	mg/kg	24	2.0	17	5.2	27	26	32	2.0	6858501
Acid Extractable Cobalt (Co)	mg/kg	2.9	1.0	1.6	1.6	6.2	8.0	18	1.0	6858501
Acid Extractable Copper (Cu)	mg/kg	11	2.0	4.9	<2.0	11	20	12	2.0	6858501
Acid Extractable Iron (Fe)	mg/kg	36000	50	31000	5300	31000	30000	31000	50	6858501
Acid Extractable Lead (Pb)	mg/kg	18	0.50	11	3.8	12	13	15	0.50	6858501
Acid Extractable Lithium (Li)	mg/kg	18	2.0	11	3.7	35	31	48	2.0	6858501
Acid Extractable Manganese (Mn)	mg/kg	330	2.0	98	96	250	350	1200	2.0	6858501
Acid Extractable Mercury (Hg)	mg/kg	0.15	0.10	0.15	<0.10	0.18	0.18	0.27	0.10	6858501
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Nickel (Ni)	mg/kg	7.6	2.0	4.9	4.1	16	20	22	2.0	6858501
Acid Extractable Rubidium (Rb)	mg/kg	7.5	2.0	3.8	3.2	9.1	12	13	2.0	6858501
Acid Extractable Selenium (Se)	mg/kg	1.2	0.50	1.4	<0.50	1.5	1.2	1.4	0.50	6858501
Acid Extractable Silver (Ag)	mg/kg	<0.50	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6858501
Acid Extractable Strontium (Sr)	mg/kg	5.9	5.0	<5.0	<5.0	6.4	7.3	7.3	5.0	6858501
Acid Extractable Thallium (Tl)	mg/kg	0.13	0.10	<0.10	<0.10	0.10	0.14	0.22	0.10	6858501
Acid Extractable Tin (Sn)	mg/kg	1.1	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6858501
Acid Extractable Uranium (U)	mg/kg	0.51	0.10	0.50	0.18	0.77	0.82	1.5	0.10	6858501
Acid Extractable Vanadium (V)	mg/kg	40	2.0	34	11	32	29	34	2.0	6858501
Acid Extractable Zinc (Zn)	mg/kg	41	5.0	16	9.8	40	57	76	5.0	6858501

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 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.bvlabs.com

BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NEM361	NEM362	NEM362	NEM363	NEM368	NEM369		
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21		
COC Number		D40299	D40299	D40299	D40299	48081	48081		
	UNITS	**TP20-30**	**TP20-31**	**TP20-31 Lab-Dup**	**TP20-32**	**TP20-33**	**TP20-34**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	28000	6100	5900	20000	27000	14000	10	6856585
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Arsenic (As)	mg/kg	110	140	140	250	110	31	2.0	6856585
Acid Extractable Barium (Ba)	mg/kg	28	9.3	8.6	49	24	24	5.0	6856585
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	50	6856585
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6856585
Acid Extractable Chromium (Cr)	mg/kg	31	7.3	6.7	25	33	18	2.0	6856585
Acid Extractable Cobalt (Co)	mg/kg	7.8	1.2	1.0	11	4.3	1.8	1.0	6856585
Acid Extractable Copper (Cu)	mg/kg	16	3.1	2.8	15	4.9	3.1	2.0	6856585
Acid Extractable Iron (Fe)	mg/kg	31000	16000	15000	31000	55000	31000	50	6856585
Acid Extractable Lead (Pb)	mg/kg	14	8.3	7.9	13	14	9.9	0.50	6856585
Acid Extractable Lithium (Li)	mg/kg	34	4.3	4.2	26	17	9.9	2.0	6856585
Acid Extractable Manganese (Mn)	mg/kg	320	110	100	490	260	100	2.0	6856585
Acid Extractable Mercury (Hg)	mg/kg	0.19	0.11	<0.10	0.15	0.17	0.14	0.10	6856585
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Nickel (Ni)	mg/kg	21	2.8	2.6	17	11	6.5	2.0	6856585
Acid Extractable Rubidium (Rb)	mg/kg	9.7	4.5	4.2	13	9.5	5.4	2.0	6856585
Acid Extractable Selenium (Se)	mg/kg	1.7	0.66	0.59	0.84	1.9	1.1	0.50	6856585
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6856585
Acid Extractable Strontium (Sr)	mg/kg	<5.0	<5.0	<5.0	5.8	<5.0	5.9	5.0	6856585
Acid Extractable Thallium (Tl)	mg/kg	0.17	<0.10	<0.10	0.16	0.13	<0.10	0.10	6856585
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	1.2	1.6	1.0	6856585
Acid Extractable Uranium (U)	mg/kg	0.88	0.33	0.28	0.62	0.68	0.48	0.10	6856585
Acid Extractable Vanadium (V)	mg/kg	31	27	26	42	70	67	2.0	6856585
Acid Extractable Zinc (Zn)	mg/kg	56	9.6	8.1	49	33	22	5.0	6856585

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NEM370	NEM371	NEM372	NEM373	NEM374	NEM375		
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/20	2020/07/20	2020/07/21		
COC Number		48081	48081	48081	48081	48081	48081		
	UNITS	**TP20-35**	**TP20-36**	**TP20-37**	**TP20-39**	**TP20-40**	**TP20-41**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	23000	25000	13000	21000	18000	34000	10	6856585
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Arsenic (As)	mg/kg	110	130	180	150	290	110	2.0	6856585
Acid Extractable Barium (Ba)	mg/kg	41	27	19	73	62	26	5.0	6856585
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	50	6856585
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6856585
Acid Extractable Chromium (Cr)	mg/kg	28	29	18	30	26	26	2.0	6856585
Acid Extractable Cobalt (Co)	mg/kg	7.0	5.7	3.4	29	10	2.2	1.0	6856585
Acid Extractable Copper (Cu)	mg/kg	9.8	11	10	31	12	4.9	2.0	6856585
Acid Extractable Iron (Fe)	mg/kg	31000	33000	30000	33000	29000	32000	50	6856585
Acid Extractable Lead (Pb)	mg/kg	12	11	11	15	30	12	0.50	6856585
Acid Extractable Lithium (Li)	mg/kg	23	21	15	46	25	16	2.0	6856585
Acid Extractable Manganese (Mn)	mg/kg	310	300	180	610	1200	110	2.0	6856585
Acid Extractable Mercury (Hg)	mg/kg	0.13	0.12	0.12	0.60	7.2	0.29	0.10	6856585
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6856585
Acid Extractable Nickel (Ni)	mg/kg	17	13	9.5	52	21	7.4	2.0	6856585
Acid Extractable Rubidium (Rb)	mg/kg	15	10	6.8	21	14	5.2	2.0	6856585
Acid Extractable Selenium (Se)	mg/kg	1.0	1.2	1.1	<0.50	1.1	2.5	0.50	6856585
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6856585
Acid Extractable Strontium (Sr)	mg/kg	6.1	<5.0	<5.0	11	16	8.5	5.0	6856585
Acid Extractable Thallium (Tl)	mg/kg	0.15	0.12	<0.10	0.27	0.21	<0.10	0.10	6856585
Acid Extractable Tin (Sn)	mg/kg	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6856585
Acid Extractable Uranium (U)	mg/kg	0.61	0.71	0.54	1.5	1.2	0.58	0.10	6856585
Acid Extractable Vanadium (V)	mg/kg	42	48	35	33	24	41	2.0	6856585
Acid Extractable Zinc (Zn)	mg/kg	46	40	28	110	77	28	5.0	6856585

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NEM376	NEM377	NEM379	NEM380	NEM381		NEM382		
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21		2020/07/21		
COC Number		48081	48081	48082	48082	48082		48082		
	UNITS	**TP20-44**	**TP20-45**	**TP20-46**	**TP20-47**	**TP20-48**	**QC Batch**	**TP20-49**	**RDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	16000	18000	12000	16000	19000	6856585	19000	10	6858501
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	6856585	<2.0	2.0	6858501
Acid Extractable Arsenic (As)	mg/kg	180	130	15	180	270	6856585	250	2.0	6858501
Acid Extractable Barium (Ba)	mg/kg	42	25	15	26	20	6856585	26	5.0	6858501
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	6856585	<2.0	2.0	6858501
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	6856585	<2.0	2.0	6858501
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	6856585	<50	50	6858501
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	6856585	<0.30	0.30	6858501
Acid Extractable Chromium (Cr)	mg/kg	23	27	12	16	22	6856585	22	2.0	6858501
Acid Extractable Cobalt (Co)	mg/kg	14	13	2.5	3.2	3.3	6856585	7.2	1.0	6858501
Acid Extractable Copper (Cu)	mg/kg	30	10	4.1	7.1	6.7	6856585	12	2.0	6858501
Acid Extractable Iron (Fe)	mg/kg	28000	30000	18000	27000	31000	6856585	31000	50	6858501
Acid Extractable Lead (Pb)	mg/kg	13	18	8.6	17	9.7	6856585	12	0.50	6858501
Acid Extractable Lithium (Li)	mg/kg	32	37	10	14	16	6856585	27	2.0	6858501
Acid Extractable Manganese (Mn)	mg/kg	450	400	140	170	170	6856585	350	2.0	6858501
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	0.16	0.10	6856585	<0.10	0.10	6858501
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	6856585	<2.0	2.0	6858501
Acid Extractable Nickel (Ni)	mg/kg	22	17	7.7	9.3	7.9	6856585	16	2.0	6858501
Acid Extractable Rubidium (Rb)	mg/kg	16	11	7.6	9.2	6.3	6856585	10	2.0	6858501
Acid Extractable Selenium (Se)	mg/kg	<0.50	0.89	0.69	2.2	1.4	6856585	1.0	0.50	6858501
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	6856585	<0.50	0.50	6858501
Acid Extractable Strontium (Sr)	mg/kg	5.5	5.6	<5.0	6.6	<5.0	6856585	6.6	5.0	6858501
Acid Extractable Thallium (Tl)	mg/kg	0.16	0.11	<0.10	0.13	0.10	6856585	0.12	0.10	6858501
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	6856585	<1.0	1.0	6858501
Acid Extractable Uranium (U)	mg/kg	0.75	0.65	0.50	0.84	0.54	6856585	0.76	0.10	6858501
Acid Extractable Vanadium (V)	mg/kg	24	37	27	26	37	6856585	26	2.0	6858501
Acid Extractable Zinc (Zn)	mg/kg	52	58	21	28	30	6856585	45	5.0	6858501

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NEM383	NEM384	NEM385	NEM386	NEM387	NEM388		
Sampling Date		2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21	2020/07/21		
COC Number		48082	48082	48082	48082	48082	48082		
	UNITS	**TP20-50**	**TP20-51**	**TP20-52**	**TP20-53**	**TP20-54**	**TP20-57**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	21000	30000	5900	19000	27000	33000	10	6858501
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Arsenic (As)	mg/kg	200	120	4.3	260	130	140	2.0	6858501
Acid Extractable Barium (Ba)	mg/kg	26	39	14	32	22	40	5.0	6858501
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	50	6858501
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6858501
Acid Extractable Chromium (Cr)	mg/kg	19	29	8.5	22	26	41	2.0	6858501
Acid Extractable Cobalt (Co)	mg/kg	4.3	23	2.0	5.5	3.9	10	1.0	6858501
Acid Extractable Copper (Cu)	mg/kg	10	10	2.3	14	6.2	18	2.0	6858501
Acid Extractable Iron (Fe)	mg/kg	28000	46000	6900	32000	24000	40000	50	6858501
Acid Extractable Lead (Pb)	mg/kg	17	33	6.5	11	12	12	0.50	6858501
Acid Extractable Lithium (Li)	mg/kg	20	22	7.6	22	22	49	2.0	6858501
Acid Extractable Manganese (Mn)	mg/kg	210	1300	97	280	160	380	2.0	6858501
Acid Extractable Mercury (Hg)	mg/kg	0.20	0.33	<0.10	<0.10	0.13	<0.10	0.10	6858501
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858501
Acid Extractable Nickel (Ni)	mg/kg	11	9.3	5.6	13	9.6	24	2.0	6858501
Acid Extractable Rubidium (Rb)	mg/kg	8.9	11	7.7	9.3	7.3	11	2.0	6858501
Acid Extractable Selenium (Se)	mg/kg	2.0	3.9	<0.50	1.2	1.6	0.95	0.50	6858501
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6858501
Acid Extractable Strontium (Sr)	mg/kg	6.6	7.9	<5.0	5.8	5.3	<5.0	5.0	6858501
Acid Extractable Thallium (Tl)	mg/kg	0.11	0.18	<0.10	0.14	0.11	0.13	0.10	6858501
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6858501
Acid Extractable Uranium (U)	mg/kg	0.93	1.8	0.31	0.72	0.73	0.76	0.10	6858501
Acid Extractable Vanadium (V)	mg/kg	24	39	13	33	38	52	2.0	6858501
Acid Extractable Zinc (Zn)	mg/kg	37	32	13	49	27	64	5.0	6858501

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NEM391		NEM392		NEM393	NEM394		NEM395		
Sampling Date		2020/07/20		2020/07/20		2020/07/20	2020/07/21		2020/07/20		
COC Number		48080		48080		48080	48080		48080		
	UNITS	**TP20-58**	**RDL**	**TP20-59**	**RDL**	**TP20-60**	**TP20-61**	**QC Batch**	**TP20-DUP1**	**RDL**	**QC Batch**
Metals											
Acid Extractable Aluminum (Al)	mg/kg	15000	10	17000	10	13000	27000	6858501	24000	10	6858546
Acid Extractable Antimony (Sb)	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	<2.0	6858501	<2.0	2.0	6858546
Acid Extractable Arsenic (As)	mg/kg	17	2.0	1000	20	140	31	6858501	230	2.0	6858546
Acid Extractable Barium (Ba)	mg/kg	16	5.0	45	5.0	34	35	6858501	82	5.0	6858546
Acid Extractable Beryllium (Be)	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	<2.0	6858501	<2.0	2.0	6858546
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	<2.0	6858501	<2.0	2.0	6858546
Acid Extractable Boron (B)	mg/kg	<50	50	<50	50	<50	<50	6858501	<50	50	6858546
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.30	0.38	0.30	<0.30	<0.30	6858501	<0.30	0.30	6858546
Acid Extractable Chromium (Cr)	mg/kg	16	2.0	24	2.0	20	26	6858501	32	2.0	6858546
Acid Extractable Cobalt (Co)	mg/kg	2.4	1.0	15	1.0	7.5	7.7	6858501	36	1.0	6858546
Acid Extractable Copper (Cu)	mg/kg	5.8	2.0	33	2.0	21	12	6858501	27	2.0	6858546
Acid Extractable Iron (Fe)	mg/kg	22000	50	35000	50	28000	29000	6858501	34000	50	6858546
Acid Extractable Lead (Pb)	mg/kg	8.3	0.50	40	0.50	13	11	6858501	19	0.50	6858546
Acid Extractable Lithium (Li)	mg/kg	14	2.0	38	2.0	30	29	6858501	46	2.0	6858546
Acid Extractable Manganese (Mn)	mg/kg	120	2.0	650	2.0	390	300	6858501	720	2.0	6858546
Acid Extractable Mercury (Hg)	mg/kg	0.13	0.10	<0.10	0.10	<0.10	0.10	6858501	1.1	0.10	6858546
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	<2.0	6858501	<2.0	2.0	6858546
Acid Extractable Nickel (Ni)	mg/kg	6.8	2.0	32	2.0	19	17	6858501	50	2.0	6858546
Acid Extractable Rubidium (Rb)	mg/kg	6.6	2.0	18	2.0	14	12	6858501	21	2.0	6858546
Acid Extractable Selenium (Se)	mg/kg	0.98	0.50	<0.50	0.50	<0.50	1.3	6858501	0.64	0.50	6858546
Acid Extractable Silver (Ag)	mg/kg	<0.50	0.50	<0.50	0.50	<0.50	<0.50	6858501	<0.50	0.50	6858546
Acid Extractable Strontium (Sr)	mg/kg	5.5	5.0	12	5.0	9.8	5.8	6858501	15	5.0	6858546
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.10	0.17	0.10	0.12	0.16	6858501	0.35	0.10	6858546
Acid Extractable Tin (Sn)	mg/kg	<1.0	1.0	<1.0	1.0	<1.0	<1.0	6858501	<1.0	1.0	6858546
Acid Extractable Uranium (U)	mg/kg	0.49	0.10	1.2	0.10	1.0	0.83	6858501	1.3	0.10	6858546
Acid Extractable Vanadium (V)	mg/kg	30	2.0	26	2.0	21	29	6858501	35	2.0	6858546
Acid Extractable Zinc (Zn)	mg/kg	18	5.0	140	5.0	48	49	6858501	120	5.0	6858546

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NEM396	NEM397		
Sampling Date		2020/07/21	2020/07/21		
COC Number		48080	48080		
	UNITS	**TP20-DUP-2**	**TP20-DUP3**	**RDL**	**QC Batch**
Metals					
Acid Extractable Aluminum (Al)	mg/kg	18000	32000	10	6858546
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	2.0	6858546
Acid Extractable Arsenic (As)	mg/kg	190	120	2.0	6858546
Acid Extractable Barium (Ba)	mg/kg	43	36	5.0	6858546
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	2.0	6858546
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	2.0	6858546
Acid Extractable Boron (B)	mg/kg	<50	<50	50	6858546
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	0.30	6858546
Acid Extractable Chromium (Cr)	mg/kg	24	29	2.0	6858546
Acid Extractable Cobalt (Co)	mg/kg	13	28	1.0	6858546
Acid Extractable Copper (Cu)	mg/kg	33	11	2.0	6858546
Acid Extractable Iron (Fe)	mg/kg	29000	47000	50	6858546
Acid Extractable Lead (Pb)	mg/kg	13	35	0.50	6858546
Acid Extractable Lithium (Li)	mg/kg	35	23	2.0	6858546
Acid Extractable Manganese (Mn)	mg/kg	460	1500	2.0	6858546
Acid Extractable Mercury (Hg)	mg/kg	<0.10	0.36	0.10	6858546
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	2.0	6858546
Acid Extractable Nickel (Ni)	mg/kg	24	9.5	2.0	6858546
Acid Extractable Rubidium (Rb)	mg/kg	17	11	2.0	6858546
Acid Extractable Selenium (Se)	mg/kg	<0.50	4.1	0.50	6858546
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	0.50	6858546
Acid Extractable Strontium (Sr)	mg/kg	6.5	8.3	5.0	6858546
Acid Extractable Thallium (Tl)	mg/kg	0.17	0.18	0.10	6858546
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	1.0	6858546
Acid Extractable Uranium (U)	mg/kg	0.88	1.9	0.10	6858546
Acid Extractable Vanadium (V)	mg/kg	25	39	2.0	6858546
Acid Extractable Zinc (Zn)	mg/kg	56	34	5.0	6858546

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

BV Labs ID: NEM354 **Collected:** 2020/07/20
Sample ID: TP20-06 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/29	Bryon Angevine

BV Labs ID: NEM355 **Collected:** 2020/07/21
Sample ID: TP20-07 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM356 **Collected:** 2020/07/21
Sample ID: TP20-08 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM357 **Collected:** 2020/07/21
Sample ID: TP20-09 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM358 **Collected:** 2020/07/21
Sample ID: TP20-10 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM360 **Collected:** 2020/07/20
Sample ID: TP20-29 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM361 **Collected:** 2020/07/21
Sample ID: TP20-30 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

TEST SUMMARY

BV Labs ID: NEM362 **Collected:** 2020/07/21
Sample ID: TP20-31 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM362 Dup **Collected:** 2020/07/21
Sample ID: TP20-31 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM363 **Collected:** 2020/07/21
Sample ID: TP20-32 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM368 **Collected:** 2020/07/21
Sample ID: TP20-33 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM369 **Collected:** 2020/07/21
Sample ID: TP20-34 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM370 **Collected:** 2020/07/21
Sample ID: TP20-35 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM371 **Collected:** 2020/07/21
Sample ID: TP20-36 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

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Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

TEST SUMMARY

BV Labs ID: NEM372 **Collected:** 2020/07/21
Sample ID: TP20-37 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM373 **Collected:** 2020/07/20
Sample ID: TP20-39 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM374 **Collected:** 2020/07/20
Sample ID: TP20-40 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM375 **Collected:** 2020/07/21
Sample ID: TP20-41 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM376 **Collected:** 2020/07/21
Sample ID: TP20-44 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM377 **Collected:** 2020/07/21
Sample ID: TP20-45 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM379 **Collected:** 2020/07/21
Sample ID: TP20-46 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NEM380 **Collected:** 2020/07/21
Sample ID: TP20-47 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM381 **Collected:** 2020/07/21
Sample ID: TP20-48 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6856585	2020/07/27	2020/07/28	Bryon Angevine

BV Labs ID: NEM382 **Collected:** 2020/07/21
Sample ID: TP20-49 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM383 **Collected:** 2020/07/21
Sample ID: TP20-50 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM384 **Collected:** 2020/07/21
Sample ID: TP20-51 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM385 **Collected:** 2020/07/21
Sample ID: TP20-52 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM386 **Collected:** 2020/07/21
Sample ID: TP20-53 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

TEST SUMMARY

BV Labs ID: NEM387 **Collected:** 2020/07/21
Sample ID: TP20-54 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM388 **Collected:** 2020/07/21
Sample ID: TP20-57 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM391 **Collected:** 2020/07/20
Sample ID: TP20-58 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM392 **Collected:** 2020/07/20
Sample ID: TP20-59 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/29	Bryon Angevine

BV Labs ID: NEM393 **Collected:** 2020/07/20
Sample ID: TP20-60 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM394 **Collected:** 2020/07/21
Sample ID: TP20-61 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858501	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM395 **Collected:** 2020/07/20
Sample ID: TP20-DUP1 **Shipped:**
Matrix: Soil **Received:** 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

TEST SUMMARY

BV Labs ID: NEM396
Sample ID: TP20-DUP-2
Matrix: Soil

Collected: 2020/07/21
Shipped:
Received: 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NEM397
Sample ID: TP20-DUP3
Matrix: Soil

Collected: 2020/07/21
Shipped:
Received: 2020/07/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

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GENERAL COMMENTS

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

Package 1	9.3°C

Results relate only to the items tested.

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BV Labs Job #: C0I5405
Report Date: 2020/07/30

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6856585	Acid Extractable Aluminum (Al)	2020/07/28					<10	mg/kg	4.1	35
6856585	Acid Extractable Antimony (Sb)	2020/07/28	107	75 - 125	104	75 - 125	<2.0	mg/kg	NC	35
6856585	Acid Extractable Arsenic (As)	2020/07/28	NC	75 - 125	100	75 - 125	<2.0	mg/kg	2.6	35
6856585	Acid Extractable Barium (Ba)	2020/07/28	116	75 - 125	101	75 - 125	<5.0	mg/kg	7.7	35
6856585	Acid Extractable Beryllium (Be)	2020/07/28	98	75 - 125	93	75 - 125	<2.0	mg/kg	NC	35
6856585	Acid Extractable Bismuth (Bi)	2020/07/28	105	75 - 125	101	75 - 125	<2.0	mg/kg	NC	35
6856585	Acid Extractable Boron (B)	2020/07/28	79	75 - 125	94	75 - 125	<50	mg/kg	NC	35
6856585	Acid Extractable Cadmium (Cd)	2020/07/28	103	75 - 125	96	75 - 125	<0.30	mg/kg	NC	35
6856585	Acid Extractable Chromium (Cr)	2020/07/28	105	75 - 125	97	75 - 125	<2.0	mg/kg	8.2	35
6856585	Acid Extractable Cobalt (Co)	2020/07/28	99	75 - 125	96	75 - 125	<1.0	mg/kg	11	35
6856585	Acid Extractable Copper (Cu)	2020/07/28	101	75 - 125	96	75 - 125	<2.0	mg/kg	9.9	35
6856585	Acid Extractable Iron (Fe)	2020/07/28					<50	mg/kg	4.5	35
6856585	Acid Extractable Lead (Pb)	2020/07/28	105	75 - 125	99	75 - 125	<0.50	mg/kg	3.9	35
6856585	Acid Extractable Lithium (Li)	2020/07/28	106	75 - 125	97	75 - 125	<2.0	mg/kg	1.9	35
6856585	Acid Extractable Manganese (Mn)	2020/07/28	NC	75 - 125	101	75 - 125	<2.0	mg/kg	7.8	35
6856585	Acid Extractable Mercury (Hg)	2020/07/28	100	75 - 125	103	75 - 125	<0.10	mg/kg	11	35
6856585	Acid Extractable Molybdenum (Mo)	2020/07/28	111	75 - 125	102	75 - 125	<2.0	mg/kg	NC	35
6856585	Acid Extractable Nickel (Ni)	2020/07/28	103	75 - 125	99	75 - 125	<2.0	mg/kg	9.5	35
6856585	Acid Extractable Rubidium (Rb)	2020/07/28	105	75 - 125	102	75 - 125	<2.0	mg/kg	8.5	35
6856585	Acid Extractable Selenium (Se)	2020/07/28	105	75 - 125	101	75 - 125	<0.50	mg/kg	11	35
6856585	Acid Extractable Silver (Ag)	2020/07/28	107	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
6856585	Acid Extractable Strontium (Sr)	2020/07/28	112	75 - 125	103	75 - 125	<5.0	mg/kg	NC	35
6856585	Acid Extractable Thallium (Tl)	2020/07/28	107	75 - 125	101	75 - 125	<0.10	mg/kg	NC	35
6856585	Acid Extractable Tin (Sn)	2020/07/28	104	75 - 125	100	75 - 125	<1.0	mg/kg	NC	35
6856585	Acid Extractable Uranium (U)	2020/07/28	114	75 - 125	104	75 - 125	<0.10	mg/kg	19	35
6856585	Acid Extractable Vanadium (V)	2020/07/28	108	75 - 125	100	75 - 125	<2.0	mg/kg	5.2	35
6856585	Acid Extractable Zinc (Zn)	2020/07/28	106	75 - 125	97	75 - 125	<5.0	mg/kg	17	35
6858501	Acid Extractable Aluminum (Al)	2020/07/28					<10	mg/kg	2.8	35
6858501	Acid Extractable Antimony (Sb)	2020/07/28	100	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35
6858501	Acid Extractable Arsenic (As)	2020/07/28	106	75 - 125	103	75 - 125	<2.0	mg/kg	3.8	35
6858501	Acid Extractable Barium (Ba)	2020/07/28	110	75 - 125	99	75 - 125	<5.0	mg/kg	6.8	35
6858501	Acid Extractable Beryllium (Be)	2020/07/28	105	75 - 125	100	75 - 125	<2.0	mg/kg	NC	35

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6858501	Acid Extractable Bismuth (Bi)	2020/07/28	107	75 - 125	102	75 - 125	<2.0	mg/kg	NC	35
6858501	Acid Extractable Boron (B)	2020/07/28	83	75 - 125	105	75 - 125	<50	mg/kg	NC	35
6858501	Acid Extractable Cadmium (Cd)	2020/07/28	102	75 - 125	98	75 - 125	<0.30	mg/kg	NC	35
6858501	Acid Extractable Chromium (Cr)	2020/07/28	105	75 - 125	101	75 - 125	<2.0	mg/kg	10	35
6858501	Acid Extractable Cobalt (Co)	2020/07/28	104	75 - 125	100	75 - 125	<1.0	mg/kg	3.7	35
6858501	Acid Extractable Copper (Cu)	2020/07/28	105	75 - 125	102	75 - 125	<2.0	mg/kg	14	35
6858501	Acid Extractable Iron (Fe)	2020/07/28					<50	mg/kg	0.78	35
6858501	Acid Extractable Lead (Pb)	2020/07/28	106	75 - 125	100	75 - 125	<0.50	mg/kg	2.1	35
6858501	Acid Extractable Lithium (Li)	2020/07/28	116	75 - 125	105	75 - 125	<2.0	mg/kg	5.2	35
6858501	Acid Extractable Manganese (Mn)	2020/07/28	NC	75 - 125	105	75 - 125	<2.0	mg/kg	7.5	35
6858501	Acid Extractable Mercury (Hg)	2020/07/28	99	75 - 125	104	75 - 125	<0.10	mg/kg	NC	35
6858501	Acid Extractable Molybdenum (Mo)	2020/07/28	116	75 - 125	101	75 - 125	<2.0	mg/kg	NC	35
6858501	Acid Extractable Nickel (Ni)	2020/07/28	107	75 - 125	102	75 - 125	<2.0	mg/kg	4.3	35
6858501	Acid Extractable Rubidium (Rb)	2020/07/28	98	75 - 125	100	75 - 125	<2.0	mg/kg	4.0	35
6858501	Acid Extractable Selenium (Se)	2020/07/28	103	75 - 125	102	75 - 125	<0.50	mg/kg	NC	35
6858501	Acid Extractable Silver (Ag)	2020/07/28	106	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
6858501	Acid Extractable Strontium (Sr)	2020/07/28	115	75 - 125	106	75 - 125	<5.0	mg/kg	12	35
6858501	Acid Extractable Thallium (Tl)	2020/07/28	104	75 - 125	101	75 - 125	<0.10	mg/kg	NC	35
6858501	Acid Extractable Tin (Sn)	2020/07/28	106	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35
6858501	Acid Extractable Uranium (U)	2020/07/28	110	75 - 125	105	75 - 125	<0.10	mg/kg	6.6	35
6858501	Acid Extractable Vanadium (V)	2020/07/28	110	75 - 125	105	75 - 125	<2.0	mg/kg	4.3	35
6858501	Acid Extractable Zinc (Zn)	2020/07/28	109	75 - 125	104	75 - 125	<5.0	mg/kg	2.6	35
6858546	Acid Extractable Aluminum (Al)	2020/07/28					<10	mg/kg	0.87	35
6858546	Acid Extractable Antimony (Sb)	2020/07/28	96	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Arsenic (As)	2020/07/28	98	75 - 125	102	75 - 125	<2.0	mg/kg	8.4	35
6858546	Acid Extractable Barium (Ba)	2020/07/28	NC	75 - 125	103	75 - 125	<5.0	mg/kg	3.0	35
6858546	Acid Extractable Beryllium (Be)	2020/07/28	100	75 - 125	100	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Bismuth (Bi)	2020/07/28	103	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Boron (B)	2020/07/28	93	75 - 125	103	75 - 125	<50	mg/kg	NC	35
6858546	Acid Extractable Cadmium (Cd)	2020/07/28	97	75 - 125	98	75 - 125	<0.30	mg/kg	NC	35
6858546	Acid Extractable Chromium (Cr)	2020/07/28	99	75 - 125	99	75 - 125	<2.0	mg/kg	3.9	35
6858546	Acid Extractable Cobalt (Co)	2020/07/28	101	75 - 125	100	75 - 125	<1.0	mg/kg	2.2	35

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6858546	Acid Extractable Copper (Cu)	2020/07/28	101	75 - 125	100	75 - 125	<2.0	mg/kg	4.7	35
6858546	Acid Extractable Iron (Fe)	2020/07/28					<50	mg/kg	11	35
6858546	Acid Extractable Lead (Pb)	2020/07/28	95	75 - 125	102	75 - 125	<0.50	mg/kg	26	35
6858546	Acid Extractable Lithium (Li)	2020/07/28	104	75 - 125	104	75 - 125	<2.0	mg/kg	4.2	35
6858546	Acid Extractable Manganese (Mn)	2020/07/28	NC	75 - 125	101	75 - 125	<2.0	mg/kg	5.4	35
6858546	Acid Extractable Mercury (Hg)	2020/07/28	98	75 - 125	105	75 - 125	<0.10	mg/kg	NC	35
6858546	Acid Extractable Molybdenum (Mo)	2020/07/28	102	75 - 125	109	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Nickel (Ni)	2020/07/28	104	75 - 125	102	75 - 125	<2.0	mg/kg	1.2	35
6858546	Acid Extractable Rubidium (Rb)	2020/07/28	99	75 - 125	100	75 - 125	<2.0	mg/kg	10	35
6858546	Acid Extractable Selenium (Se)	2020/07/28	98	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
6858546	Acid Extractable Silver (Ag)	2020/07/28	102	75 - 125	101	75 - 125	<0.50	mg/kg	NC	35
6858546	Acid Extractable Strontium (Sr)	2020/07/28	108	75 - 125	102	75 - 125	<5.0	mg/kg	0.93	35
6858546	Acid Extractable Thallium (Tl)	2020/07/28	102	75 - 125	102	75 - 125	<0.10	mg/kg	NC	35
6858546	Acid Extractable Tin (Sn)	2020/07/28	100	75 - 125	102	75 - 125	<1.0	mg/kg	NC	35
6858546	Acid Extractable Uranium (U)	2020/07/28	106	75 - 125	106	75 - 125	<0.10	mg/kg	8.5	35
6858546	Acid Extractable Vanadium (V)	2020/07/28	84	75 - 125	104	75 - 125	<2.0	mg/kg	33	35
6858546	Acid Extractable Zinc (Zn)	2020/07/28	104	75 - 125	102	75 - 125	<5.0	mg/kg	1.1	35

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.

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).

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BV Labs Job #: C0I5405
Report Date: 2020/07/30

Stantec Consulting Ltd
Client Project #: 121619250.2500.995.100
Site Location: BEAVER DAM
Sampler Initials: PT

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Eric Dearman, Scientific Specialist

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

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Your Project #: 121619250.2500.995

Attention: Patrick Turner

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Your C.O.C. #: 781593-10-01, 781593-09-01, 781593-01-01, 781593-02-01

Report Date: 2020/07/31
Report #: R6269355
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0I8251
Received: 2020/07/24, 14:28

Sample Matrix: Soil
Samples Received: 36

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Metals Solids Acid Extr. ICPMS	14	2020/07/28	2020/07/28	ATL SOP 00058	EPA 6020B R2 m
Metals Solids Acid Extr. ICPMS	1	2020/07/28	2020/07/29	ATL SOP 00058	EPA 6020B R2 m
Metals Solids Acid Extr. ICPMS	13	2020/07/29	2020/07/30	ATL SOP 00058	EPA 6020B R2 m
Metals Solids Acid Extr. ICPMS	8	2020/07/29	2020/07/31	ATL SOP 00058	EPA 6020B R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs 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 BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
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.

Your Project #: 121619250.2500.995

Attention: Patrick Turner

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Your C.O.C. #: 781593-10-01, 781593-09-01, 781593-01-01, 781593-02-01

Report Date: 2020/07/31
Report #: R6269355
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0I8251
Received: 2020/07/24, 14:28

Encryption Key

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

==========

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BV Labs Job #: C0I8251
Report Date: 2020/07/31

Stantec Consulting Ltd
Client Project #: 121619250.2500.995
Sampler Initials: EA

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC381	NFC382	NFC383	NFC384	NFC386		
Sampling Date		2020/07/22 16:00	2020/07/22 16:00	2020/07/22 16:00	2020/07/22 16:00	2020/07/22 16:00		
COC Number		781593-10-01	781593-10-01	781593-10-01	781593-10-01	781593-10-01		
	UNITS	**TP20-01**	**TP20-02**	**TP20-03**	**TP20-04**	**TP20-13**	**RDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	47000	11000	1200	16000	41000	10	6858546
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858546
Acid Extractable Arsenic (As)	mg/kg	11	7.1	<2.0	15	40	2.0	6858546
Acid Extractable Barium (Ba)	mg/kg	39	19	5.8	26	32	5.0	6858546
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858546
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858546
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	50	6858546
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6858546
Acid Extractable Chromium (Cr)	mg/kg	49	13	<2.0	17	39	2.0	6858546
Acid Extractable Cobalt (Co)	mg/kg	5.4	1.7	<1.0	3.8	8.0	1.0	6858546
Acid Extractable Copper (Cu)	mg/kg	13	3.6	<2.0	7.3	19	2.0	6858546
Acid Extractable Iron (Fe)	mg/kg	41000	19000	740	36000	40000	50	6858546
Acid Extractable Lead (Pb)	mg/kg	15	15	3.0	11	16	0.50	6858546
Acid Extractable Lithium (Li)	mg/kg	57	11	<2.0	20	26	2.0	6858546
Acid Extractable Manganese (Mn)	mg/kg	250	82	18	300	410	2.0	6858546
Acid Extractable Mercury (Hg)	mg/kg	0.25	<0.10	<0.10	0.12	0.23	0.10	6858546
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6858546
Acid Extractable Nickel (Ni)	mg/kg	12	3.8	<2.0	7.3	17	2.0	6858546
Acid Extractable Rubidium (Rb)	mg/kg	11	8.9	<2.0	14	10	2.0	6858546
Acid Extractable Selenium (Se)	mg/kg	2.2	0.64	<0.50	1.8	2.0	0.50	6858546
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6858546
Acid Extractable Strontium (Sr)	mg/kg	<5.0	<5.0	<5.0	5.0	5.5	5.0	6858546
Acid Extractable Thallium (Tl)	mg/kg	0.18	<0.10	<0.10	0.12	0.18	0.10	6858546
Acid Extractable Tin (Sn)	mg/kg	1.5	1.4	<1.0	<1.0	<1.0	1.0	6858546
Acid Extractable Uranium (U)	mg/kg	1.2	0.68	0.56	0.88	0.91	0.10	6858546
Acid Extractable Vanadium (V)	mg/kg	62	42	2.2	33	47	2.0	6858546
Acid Extractable Zinc (Zn)	mg/kg	53	12	<5.0	26	56	5.0	6858546

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: C0I8251
Report Date: 2020/07/31

Stantec Consulting Ltd
Client Project #: 121619250.2500.995
Sampler Initials: EA

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC387	NFC388	NFC389		NFC390	NFC390		
Sampling Date		2020/07/22 16:00	2020/07/22 16:00	2020/07/22 16:00		2020/07/22 16:00	2020/07/22 16:00		
COC Number		781593-10-01	781593-10-01	781593-10-01		781593-10-01	781593-10-01		
	UNITS	**TP20-14**	**TP20-15**	**TP20-16**	**QC Batch**	**TP20-17**	**TP20-17 Lab-Dup**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	25000	14000	21000	6858546	22000	23000	10	6858606
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	6858546	<2.0	<2.0	2.0	6858606
Acid Extractable Arsenic (As)	mg/kg	15	130	240	6858546	460	440	2.0	6858606
Acid Extractable Barium (Ba)	mg/kg	24	30	58	6858546	72	75	5.0	6858606
Acid Extractable Beryllium (Be)	mg/kg	2.3	<2.0	<2.0	6858546	<2.0	<2.0	2.0	6858606
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	6858546	3.4	3.5	2.0	6858606
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	6858546	<50	<50	50	6858606
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	6858546	<0.30	<0.30	0.30	6858606
Acid Extractable Chromium (Cr)	mg/kg	22	21	31	6858546	33	35	2.0	6858606
Acid Extractable Cobalt (Co)	mg/kg	2.0	3.8	11	6858546	4.8	5.1	1.0	6858606
Acid Extractable Copper (Cu)	mg/kg	29	7.8	28	6858546	46	47	2.0	6858606
Acid Extractable Iron (Fe)	mg/kg	4200	27000	38000	6858546	42000	42000	50	6858606
Acid Extractable Lead (Pb)	mg/kg	18	14	11	6858546	110	120	0.50	6858606
Acid Extractable Lithium (Li)	mg/kg	6.4	14	40	6858546	47	50	2.0	6858606
Acid Extractable Manganese (Mn)	mg/kg	63	210	510	6858546	400	410	2.0	6858606
Acid Extractable Mercury (Hg)	mg/kg	0.29	0.14	0.10	6858546	17	18	0.10	6858606
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	6858546	<2.0	<2.0	2.0	6858606
Acid Extractable Nickel (Ni)	mg/kg	7.0	9.3	26	6858546	9.9	9.9	2.0	6858606
Acid Extractable Rubidium (Rb)	mg/kg	5.2	10	28	6858546	47	48	2.0	6858606
Acid Extractable Selenium (Se)	mg/kg	5.2	<0.50	<0.50	6858546	<0.50	<0.50	0.50	6858606
Acid Extractable Silver (Ag)	mg/kg	0.69	<0.50	<0.50	6858546	0.62	0.63	0.50	6858606
Acid Extractable Strontium (Sr)	mg/kg	5.7	8.3	6.7	6858546	<5.0	<5.0	5.0	6858606
Acid Extractable Thallium (Tl)	mg/kg	0.13	<0.10	0.21	6858546	0.39	0.42	0.10	6858606
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	6858546	1.0	1.3	1.0	6858606
Acid Extractable Uranium (U)	mg/kg	2.2	0.35	1.0	6858546	0.66	0.65	0.10	6858606
Acid Extractable Vanadium (V)	mg/kg	10	42	36	6858546	40	42	2.0	6858606
Acid Extractable Zinc (Zn)	mg/kg	17	43	76	6858546	65	67	5.0	6858606

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC391	NFC392		NFC393	NFC394	NFC395		
Sampling Date		2020/07/22 16:00	2020/07/22 16:00		2020/07/22 16:00	2020/07/22 16:00	2020/07/22 16:00		
COC Number		781593-09-01	781593-09-01		781593-09-01	781593-09-01	781593-09-01		
	UNITS	**TP20-18**	**TP20-19**	**QC Batch**	**TP20-20**	**TP20-21**	**TP20-62**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	13000	32000	6858546	23000	24000	39000	10	6858606
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	6858546	<2.0	<2.0	<2.0	2.0	6858606
Acid Extractable Arsenic (As)	mg/kg	24	48	6858546	59	10	31	2.0	6858606
Acid Extractable Barium (Ba)	mg/kg	36	23	6858546	70	13	44	5.0	6858606
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	6858546	<2.0	<2.0	<2.0	2.0	6858606
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	6858546	<2.0	<2.0	<2.0	2.0	6858606
Acid Extractable Boron (B)	mg/kg	<50	<50	6858546	<50	<50	<50	50	6858606
Acid Extractable Cadmium (Cd)	mg/kg	0.40	<0.30	6858546	<0.30	<0.30	<0.30	0.30	6858606
Acid Extractable Chromium (Cr)	mg/kg	8.6	41	6858546	36	18	43	2.0	6858606
Acid Extractable Cobalt (Co)	mg/kg	4.1	4.5	6858546	12	<1.0	5.4	1.0	6858606
Acid Extractable Copper (Cu)	mg/kg	28	7.9	6858546	33	37	13	2.0	6858606
Acid Extractable Iron (Fe)	mg/kg	2900	64000	6858546	41000	1600	27000	50	6858606
Acid Extractable Lead (Pb)	mg/kg	15	12	6858546	9.5	21	13	0.50	6858606
Acid Extractable Lithium (Li)	mg/kg	<2.0	23	6858546	41	2.2	35	2.0	6858606
Acid Extractable Manganese (Mn)	mg/kg	58	170	6858546	490	19	180	2.0	6858606
Acid Extractable Mercury (Hg)	mg/kg	0.98	0.15	6858546	0.13	0.55	0.22	0.10	6858606
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	6858546	<2.0	<2.0	<2.0	2.0	6858606
Acid Extractable Nickel (Ni)	mg/kg	20	12	6858546	26	5.0	14	2.0	6858606
Acid Extractable Rubidium (Rb)	mg/kg	2.2	17	6858546	38	2.2	11	2.0	6858606
Acid Extractable Selenium (Se)	mg/kg	3.4	2.1	6858546	<0.50	6.4	2.3	0.50	6858606
Acid Extractable Silver (Ag)	mg/kg	0.69	<0.50	6858546	<0.50	0.82	<0.50	0.50	6858606
Acid Extractable Strontium (Sr)	mg/kg	16	<5.0	6858546	<5.0	<5.0	5.0	5.0	6858606
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.16	6858546	0.28	<0.10	0.13	0.10	6858606
Acid Extractable Tin (Sn)	mg/kg	<1.0	1.2	6858546	<1.0	<1.0	1.4	1.0	6858606
Acid Extractable Uranium (U)	mg/kg	1.6	0.76	6858546	0.75	8.5	0.80	0.10	6858606
Acid Extractable Vanadium (V)	mg/kg	6.0	76	6858546	47	8.6	67	2.0	6858606
Acid Extractable Zinc (Zn)	mg/kg	20	44	6858546	71	7.1	37	5.0	6858606

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC396			NFC397		NFC398		NFC399		
Sampling Date		2020/07/22 16:00			2020/07/22 16:00		2020/07/22 16:00		2020/07/22 16:00		
COC Number		781593-09-01			781593-09-01		781593-09-01		781593-09-01		
	UNITS	**TP20-63**	**RDL**	**QC Batch**	**TP20-64**	**RDL**	**TP20-100**	**RDL**	**TP20-101A**	**RDL**	**QC Batch**
Metals											
Acid Extractable Aluminum (Al)	mg/kg	8700	10	6858606	11000	10	13000	10	12000	10	6861076
Acid Extractable Antimony (Sb)	mg/kg	<2.0	2.0	6858606	<2.0	2.0	<2.0	2.0	<2.0	2.0	6861076
Acid Extractable Arsenic (As)	mg/kg	480	2.0	6858606	9.1	2.0	890	20	260	2.0	6861076
Acid Extractable Barium (Ba)	mg/kg	17	5.0	6858606	18	5.0	43	5.0	30	5.0	6861076
Acid Extractable Beryllium (Be)	mg/kg	<2.0	2.0	6858606	<2.0	2.0	<2.0	2.0	<2.0	2.0	6861076
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	2.0	6858606	<2.0	2.0	4.3	2.0	<2.0	2.0	6861076
Acid Extractable Boron (B)	mg/kg	<50	50	6858606	<50	50	<50	50	<50	50	6861076
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.30	6858606	<0.30	0.30	<0.30	0.30	<0.30	0.30	6861076
Acid Extractable Chromium (Cr)	mg/kg	14	2.0	6858606	16	2.0	20	2.0	20	2.0	6861076
Acid Extractable Cobalt (Co)	mg/kg	2.1	1.0	6858606	1.7	1.0	3.0	1.0	2.5	1.0	6861076
Acid Extractable Copper (Cu)	mg/kg	58	2.0	6858606	6.4	2.0	16	2.0	61	2.0	6861076
Acid Extractable Iron (Fe)	mg/kg	17000	50	6858606	14000	50	33000	50	22000	50	6861076
Acid Extractable Lead (Pb)	mg/kg	25	0.50	6858606	13	0.50	200	0.50	34	0.50	6861076
Acid Extractable Lithium (Li)	mg/kg	12	2.0	6858606	14	2.0	29	2.0	19	2.0	6861076
Acid Extractable Manganese (Mn)	mg/kg	180	2.0	6858606	170	2.0	260	2.0	230	2.0	6861076
Acid Extractable Mercury (Hg)	mg/kg	20	1.0	6858606	13	0.10	40	0.10	9.0	0.10	6861076
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	2.0	6858606	<2.0	2.0	<2.0	2.0	<2.0	2.0	6861076
Acid Extractable Nickel (Ni)	mg/kg	6.3	2.0	6858606	4.6	2.0	5.5	2.0	7.9	2.0	6861076
Acid Extractable Rubidium (Rb)	mg/kg	12	2.0	6858606	8.2	2.0	32	2.0	23	2.0	6861076
Acid Extractable Selenium (Se)	mg/kg	<0.50	0.50	6858606	<0.50	0.50	0.54	0.50	<0.50	0.50	6861076
Acid Extractable Silver (Ag)	mg/kg	<0.50	0.50	6858606	<0.50	0.50	1.2	0.50	<0.50	0.50	6861076
Acid Extractable Strontium (Sr)	mg/kg	<5.0	5.0	6858606	<5.0	5.0	<5.0	5.0	<5.0	5.0	6861076
Acid Extractable Thallium (Tl)	mg/kg	0.13	0.10	6858606	<0.10	0.10	0.62	0.10	0.20	0.10	6861076
Acid Extractable Tin (Sn)	mg/kg	<1.0	1.0	6858606	<1.0	1.0	<1.0	1.0	<1.0	1.0	6861076
Acid Extractable Uranium (U)	mg/kg	0.24	0.10	6858606	0.34	0.10	0.21	0.10	0.33	0.10	6861076
Acid Extractable Vanadium (V)	mg/kg	15	2.0	6858606	17	2.0	25	2.0	22	2.0	6861076
Acid Extractable Zinc (Zn)	mg/kg	32	5.0	6858606	33	5.0	44	5.0	44	5.0	6861076

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC400		NFC401		NFC402		NFC403		
Sampling Date		2020/07/22 16:00		2020/07/22 16:00		2020/07/22 16:00		2020/07/22 16:00		
COC Number		781593-09-01		781593-01-01		781593-01-01		781593-01-01		
	UNITS	**TP20-101B**	**RDL**	**TP20-102**	**RDL**	**TP20-DUP4**	**RDL**	**TP20-DUP5**	**RDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	14000	10	28000	10	14000	10	41000	10	6861076
Acid Extractable Antimony (Sb)	mg/kg	<2.0	2.0	<2.0	2.0	5.4	2.0	<2.0	2.0	6861076
Acid Extractable Arsenic (As)	mg/kg	740	20	40	2.0	850	20	44	2.0	6861076
Acid Extractable Barium (Ba)	mg/kg	35	5.0	32	5.0	45	5.0	32	5.0	6861076
Acid Extractable Beryllium (Be)	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	6861076
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	2.0	<2.0	2.0	4.6	2.0	<2.0	2.0	6861076
Acid Extractable Boron (B)	mg/kg	<50	50	<50	50	<50	50	<50	50	6861076
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.30	<0.30	0.30	<0.30	0.30	<0.30	0.30	6861076
Acid Extractable Chromium (Cr)	mg/kg	19	2.0	37	2.0	21	2.0	39	2.0	6861076
Acid Extractable Cobalt (Co)	mg/kg	8.1	1.0	12	1.0	3.1	1.0	8.3	1.0	6861076
Acid Extractable Copper (Cu)	mg/kg	53	2.0	8.5	2.0	16	2.0	21	2.0	6861076
Acid Extractable Iron (Fe)	mg/kg	25000	50	50000	50	34000	50	43000	50	6861076
Acid Extractable Lead (Pb)	mg/kg	45	0.50	11	0.50	190	0.50	16	0.50	6861076
Acid Extractable Lithium (Li)	mg/kg	23	2.0	37	2.0	31	2.0	27	2.0	6861076
Acid Extractable Manganese (Mn)	mg/kg	250	2.0	440	2.0	270	2.0	410	2.0	6861076
Acid Extractable Mercury (Hg)	mg/kg	36	0.10	0.56	0.10	39	0.10	0.26	0.10	6861076
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	6861076
Acid Extractable Nickel (Ni)	mg/kg	19	2.0	23	2.0	5.7	2.0	18	2.0	6861076
Acid Extractable Rubidium (Rb)	mg/kg	26	2.0	12	2.0	34	2.0	10	2.0	6861076
Acid Extractable Selenium (Se)	mg/kg	<0.50	0.50	0.51	0.50	<0.50	0.50	2.0	0.50	6861076
Acid Extractable Silver (Ag)	mg/kg	<0.50	0.50	<0.50	0.50	1.2	0.50	<0.50	0.50	6861076
Acid Extractable Strontium (Sr)	mg/kg	<5.0	5.0	5.5	5.0	<5.0	5.0	<5.0	5.0	6861076
Acid Extractable Thallium (Tl)	mg/kg	0.28	0.10	0.13	0.10	0.63	0.10	0.16	0.10	6861076
Acid Extractable Tin (Sn)	mg/kg	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	6861076
Acid Extractable Uranium (U)	mg/kg	0.29	0.10	0.67	0.10	0.21	0.10	0.88	0.10	6861076
Acid Extractable Vanadium (V)	mg/kg	22	2.0	41	2.0	26	2.0	49	2.0	6861076
Acid Extractable Zinc (Zn)	mg/kg	58	5.0	83	5.0	77	5.0	55	5.0	6861076

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: C0I8251
Report Date: 2020/07/31

Stantec Consulting Ltd
Client Project #: 121619250.2500.995
Sampler Initials: EA

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC404	NFC405	NFC406	NFC407	NFC408		
Sampling Date		2020/07/22 16:00	2020/07/22 16:00	2020/07/23 16:00	2020/07/23 16:00	2020/07/23 16:00		
COC Number		781593-01-01	781593-01-01	781593-01-01	781593-01-01	781593-01-01		
	UNITS	**TP20-DUP6**	**TP20-05**	**TP20-12**	**TP20-22A**	**TP20-22B**	**RDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	5900	12000	31000	14000	14000	10	6861076
Acid Extractable Antimony (Sb)	mg/kg	2.1	<2.0	<2.0	<2.0	<2.0	2.0	6861076
Acid Extractable Arsenic (As)	mg/kg	160	100	44	24	16	2.0	6861076
Acid Extractable Barium (Ba)	mg/kg	18	17	17	12	12	5.0	6861076
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6861076
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6861076
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	50	6861076
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6861076
Acid Extractable Chromium (Cr)	mg/kg	9.0	22	35	18	15	2.0	6861076
Acid Extractable Cobalt (Co)	mg/kg	<1.0	3.2	7.2	3.0	4.1	1.0	6861076
Acid Extractable Copper (Cu)	mg/kg	6.9	6.4	22	5.2	5.6	2.0	6861076
Acid Extractable Iron (Fe)	mg/kg	12000	34000	67000	38000	33000	50	6861076
Acid Extractable Lead (Pb)	mg/kg	11	11	13	14	7.3	0.50	6861076
Acid Extractable Lithium (Li)	mg/kg	8.3	8.7	25	13	14	2.0	6861076
Acid Extractable Manganese (Mn)	mg/kg	110	260	370	170	180	2.0	6861076
Acid Extractable Mercury (Hg)	mg/kg	17	0.16	0.21	0.15	0.11	0.10	6861076
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6861076
Acid Extractable Nickel (Ni)	mg/kg	2.1	9.5	16	7.2	5.5	2.0	6861076
Acid Extractable Rubidium (Rb)	mg/kg	10	9.8	8.4	8.3	10	2.0	6861076
Acid Extractable Selenium (Se)	mg/kg	<0.50	0.77	2.2	1.1	0.92	0.50	6861076
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6861076
Acid Extractable Strontium (Sr)	mg/kg	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	6861076
Acid Extractable Thallium (Tl)	mg/kg	0.11	0.11	0.14	0.13	0.13	0.10	6861076
Acid Extractable Tin (Sn)	mg/kg	1.3	1.2	<1.0	<1.0	<1.0	1.0	6861076
Acid Extractable Uranium (U)	mg/kg	0.13	0.67	0.71	0.49	0.52	0.10	6861076
Acid Extractable Vanadium (V)	mg/kg	10	68	46	52	42	2.0	6861076
Acid Extractable Zinc (Zn)	mg/kg	25	31	67	30	27	5.0	6861076

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC409	NFC410	NFC411	NFC412	NFC413		
Sampling Date		2020/07/23 16:00	2020/07/23 16:00	2020/07/23 16:00	2020/07/23 16:00	2020/07/23 16:00		
COC Number		781593-01-01	781593-01-01	781593-02-01	781593-02-01	781593-02-01		
	UNITS	**TP20-23**	**TP20-25**	**TP20-26**	**TP20-27**	**TP20-29**	**RDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	43000	9600	22000	24000	35000	10	6861076
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6861076
Acid Extractable Arsenic (As)	mg/kg	61	61	44	250	50	2.0	6861076
Acid Extractable Barium (Ba)	mg/kg	29	17	21	33	42	5.0	6861076
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6861076
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5.6	<2.0	<2.0	2.0	6861076
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	50	6861076
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6861076
Acid Extractable Chromium (Cr)	mg/kg	40	12	24	29	40	2.0	6861076
Acid Extractable Cobalt (Co)	mg/kg	8.4	1.9	3.3	13	9.8	1.0	6861076
Acid Extractable Copper (Cu)	mg/kg	18	4.8	10	29	17	2.0	6861076
Acid Extractable Iron (Fe)	mg/kg	44000	27000	47000	34000	37000	50	6861076
Acid Extractable Lead (Pb)	mg/kg	15	13	34	13	15	0.50	6861076
Acid Extractable Lithium (Li)	mg/kg	31	7.2	32	38	40	2.0	6861076
Acid Extractable Manganese (Mn)	mg/kg	330	160	150	520	440	2.0	6861076
Acid Extractable Mercury (Hg)	mg/kg	0.22	0.15	0.20	0.11	0.15	0.10	6861076
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6861076
Acid Extractable Nickel (Ni)	mg/kg	20	5.4	7.9	25	25	2.0	6861076
Acid Extractable Rubidium (Rb)	mg/kg	11	5.6	8.5	15	14	2.0	6861076
Acid Extractable Selenium (Se)	mg/kg	2.3	0.80	1.4	0.67	1.6	0.50	6861076
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6861076
Acid Extractable Strontium (Sr)	mg/kg	5.2	<5.0	<5.0	7.3	6.7	5.0	6861076
Acid Extractable Thallium (Tl)	mg/kg	0.16	<0.10	0.15	0.12	0.16	0.10	6861076
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	1.2	<1.0	<1.0	1.0	6861076
Acid Extractable Uranium (U)	mg/kg	0.76	0.42	0.75	0.81	0.79	0.10	6861076
Acid Extractable Vanadium (V)	mg/kg	42	44	63	33	44	2.0	6861076
Acid Extractable Zinc (Zn)	mg/kg	75	22	31	62	79	5.0	6861076

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NFC414		NFC415	NFC416	NFC417	NFC417		
Sampling Date		2020/07/23 16:00		2020/07/23 16:00	2020/07/23 16:00	2020/07/23 16:00	2020/07/23 16:00		
COC Number		781593-02-01		781593-02-01	781593-02-01	781593-02-01	781593-02-01		
	UNITS	**TP20-38**	**QC Batch**	**TP20-43**	**TP20-55**	**TP20-65**	**TP20-65 Lab-Dup**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	13000	6861076	25000	26000	6800	6800	10	6861133
Acid Extractable Antimony (Sb)	mg/kg	<2.0	6861076	<2.0	<2.0	<2.0	<2.0	2.0	6861133
Acid Extractable Arsenic (As)	mg/kg	100	6861076	20	210	200	200	2.0	6861133
Acid Extractable Barium (Ba)	mg/kg	33	6861076	34	25	21	21	5.0	6861133
Acid Extractable Beryllium (Be)	mg/kg	<2.0	6861076	<2.0	<2.0	<2.0	<2.0	2.0	6861133
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	6861076	<2.0	2.1	<2.0	<2.0	2.0	6861133
Acid Extractable Boron (B)	mg/kg	<50	6861076	<50	<50	<50	<50	50	6861133
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	6861076	<0.30	<0.30	<0.30	<0.30	0.30	6861133
Acid Extractable Chromium (Cr)	mg/kg	16	6861076	34	35	10	10	2.0	6861133
Acid Extractable Cobalt (Co)	mg/kg	6.5	6861076	5.4	2.9	<1.0	<1.0	1.0	6861133
Acid Extractable Copper (Cu)	mg/kg	7.7	6861076	6.0	19	8.3	8.5	2.0	6861133
Acid Extractable Iron (Fe)	mg/kg	21000	6861076	47000	57000	13000	13000	50	6861133
Acid Extractable Lead (Pb)	mg/kg	12	6861076	12	34	16	17	0.50	6861133
Acid Extractable Lithium (Li)	mg/kg	22	6861076	25	20	10	10	2.0	6861133
Acid Extractable Manganese (Mn)	mg/kg	450	6861076	260	200	130	130	2.0	6861133
Acid Extractable Mercury (Hg)	mg/kg	<0.10	6861076	0.14	0.10	15	15	0.10	6861133
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	6861076	<2.0	<2.0	<2.0	<2.0	2.0	6861133
Acid Extractable Nickel (Ni)	mg/kg	13	6861076	16	7.3	2.7	2.5	2.0	6861133
Acid Extractable Rubidium (Rb)	mg/kg	14	6861076	12	12	11	12	2.0	6861133
Acid Extractable Selenium (Se)	mg/kg	1.2	6861076	1.7	1.9	<0.50	<0.50	0.50	6861133
Acid Extractable Silver (Ag)	mg/kg	<0.50	6861076	<0.50	0.69	<0.50	<0.50	0.50	6861133
Acid Extractable Strontium (Sr)	mg/kg	7.2	6861076	7.2	<5.0	<5.0	<5.0	5.0	6861133
Acid Extractable Thallium (Tl)	mg/kg	0.24	6861076	0.11	0.17	0.13	0.14	0.10	6861133
Acid Extractable Tin (Sn)	mg/kg	<1.0	6861076	1.4	1.2	1.4	1.3	1.0	6861133
Acid Extractable Uranium (U)	mg/kg	1.1	6861076	0.66	0.54	0.17	0.16	0.10	6861133
Acid Extractable Vanadium (V)	mg/kg	26	6861076	66	64	11	11	2.0	6861133
Acid Extractable Zinc (Zn)	mg/kg	34	6861076	41	45	25	24	5.0	6861133

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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TEST SUMMARY

BV Labs ID: NFC381 **Collected:** 2020/07/22
Sample ID: TP20-01 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC382 **Collected:** 2020/07/22
Sample ID: TP20-02 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC383 **Collected:** 2020/07/22
Sample ID: TP20-03 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC384 **Collected:** 2020/07/22
Sample ID: TP20-04 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC386 **Collected:** 2020/07/22
Sample ID: TP20-13 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC387 **Collected:** 2020/07/22
Sample ID: TP20-14 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC388 **Collected:** 2020/07/22
Sample ID: TP20-15 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NFC389
Sample ID: TP20-16
Matrix: Soil

Collected: 2020/07/22
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC390
Sample ID: TP20-17
Matrix: Soil

Collected: 2020/07/22
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858606	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC390 Dup
Sample ID: TP20-17
Matrix: Soil

Collected: 2020/07/22
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858606	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC391
Sample ID: TP20-18
Matrix: Soil

Collected: 2020/07/22
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC392
Sample ID: TP20-19
Matrix: Soil

Collected: 2020/07/22
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858546	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC393
Sample ID: TP20-20
Matrix: Soil

Collected: 2020/07/22
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858606	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC394
Sample ID: TP20-21
Matrix: Soil

Collected: 2020/07/22
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858606	2020/07/28	2020/07/28	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NFC395 **Collected:** 2020/07/22
Sample ID: TP20-62 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858606	2020/07/28	2020/07/28	Bryon Angevine

BV Labs ID: NFC396 **Collected:** 2020/07/22
Sample ID: TP20-63 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6858606	2020/07/28	2020/07/29	Bryon Angevine

BV Labs ID: NFC397 **Collected:** 2020/07/22
Sample ID: TP20-64 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC398 **Collected:** 2020/07/22
Sample ID: TP20-100 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/31	Bryon Angevine

BV Labs ID: NFC399 **Collected:** 2020/07/22
Sample ID: TP20-101A **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC400 **Collected:** 2020/07/22
Sample ID: TP20-101B **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/31	Bryon Angevine

BV Labs ID: NFC401 **Collected:** 2020/07/22
Sample ID: TP20-102 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/31	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NFC402 **Collected:** 2020/07/22
Sample ID: TP20-DUP4 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/31	Bryon Angevine

BV Labs ID: NFC403 **Collected:** 2020/07/22
Sample ID: TP20-DUP5 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/31	Bryon Angevine

BV Labs ID: NFC404 **Collected:** 2020/07/22
Sample ID: TP20-DUP6 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC405 **Collected:** 2020/07/22
Sample ID: TP20-05 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC406 **Collected:** 2020/07/23
Sample ID: TP20-12 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC407 **Collected:** 2020/07/23
Sample ID: TP20-22A **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC408 **Collected:** 2020/07/23
Sample ID: TP20-22B **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NFC409 **Collected:** 2020/07/23
Sample ID: TP20-23 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC410 **Collected:** 2020/07/23
Sample ID: TP20-25 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC411 **Collected:** 2020/07/23
Sample ID: TP20-26 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC412 **Collected:** 2020/07/23
Sample ID: TP20-27 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC413 **Collected:** 2020/07/23
Sample ID: TP20-29 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC414 **Collected:** 2020/07/23
Sample ID: TP20-38 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861076	2020/07/29	2020/07/30	Bryon Angevine

BV Labs ID: NFC415 **Collected:** 2020/07/23
Sample ID: TP20-43 **Shipped:**
Matrix: Soil **Received:** 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861133	2020/07/29	2020/07/31	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NFC416
Sample ID: TP20-55
Matrix: Soil

Collected: 2020/07/23
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861133	2020/07/29	2020/07/31	Bryon Angevine

BV Labs ID: NFC417
Sample ID: TP20-65
Matrix: Soil

Collected: 2020/07/23
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861133	2020/07/29	2020/07/31	Bryon Angevine

BV Labs ID: NFC417 Dup
Sample ID: TP20-65
Matrix: Soil

Collected: 2020/07/23
Shipped:
Received: 2020/07/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6861133	2020/07/29	2020/07/31	Bryon Angevine

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GENERAL COMMENTS

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

Package 1	1.3°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6858546	Acid Extractable Aluminum (Al)	2020/07/28					<10	mg/kg	0.87	35
6858546	Acid Extractable Antimony (Sb)	2020/07/28	96	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Arsenic (As)	2020/07/28	98	75 - 125	102	75 - 125	<2.0	mg/kg	8.4	35
6858546	Acid Extractable Barium (Ba)	2020/07/28	NC	75 - 125	103	75 - 125	<5.0	mg/kg	3.0	35
6858546	Acid Extractable Beryllium (Be)	2020/07/28	100	75 - 125	100	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Bismuth (Bi)	2020/07/28	103	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Boron (B)	2020/07/28	93	75 - 125	103	75 - 125	<50	mg/kg	NC	35
6858546	Acid Extractable Cadmium (Cd)	2020/07/28	97	75 - 125	98	75 - 125	<0.30	mg/kg	NC	35
6858546	Acid Extractable Chromium (Cr)	2020/07/28	99	75 - 125	99	75 - 125	<2.0	mg/kg	3.9	35
6858546	Acid Extractable Cobalt (Co)	2020/07/28	101	75 - 125	100	75 - 125	<1.0	mg/kg	2.2	35
6858546	Acid Extractable Copper (Cu)	2020/07/28	101	75 - 125	100	75 - 125	<2.0	mg/kg	4.7	35
6858546	Acid Extractable Iron (Fe)	2020/07/28					<50	mg/kg	11	35
6858546	Acid Extractable Lead (Pb)	2020/07/28	95	75 - 125	102	75 - 125	<0.50	mg/kg	26	35
6858546	Acid Extractable Lithium (Li)	2020/07/28	104	75 - 125	104	75 - 125	<2.0	mg/kg	4.2	35
6858546	Acid Extractable Manganese (Mn)	2020/07/28	NC	75 - 125	101	75 - 125	<2.0	mg/kg	5.4	35
6858546	Acid Extractable Mercury (Hg)	2020/07/28	98	75 - 125	105	75 - 125	<0.10	mg/kg	NC	35
6858546	Acid Extractable Molybdenum (Mo)	2020/07/28	102	75 - 125	109	75 - 125	<2.0	mg/kg	NC	35
6858546	Acid Extractable Nickel (Ni)	2020/07/28	104	75 - 125	102	75 - 125	<2.0	mg/kg	1.2	35
6858546	Acid Extractable Rubidium (Rb)	2020/07/28	99	75 - 125	100	75 - 125	<2.0	mg/kg	10	35
6858546	Acid Extractable Selenium (Se)	2020/07/28	98	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
6858546	Acid Extractable Silver (Ag)	2020/07/28	102	75 - 125	101	75 - 125	<0.50	mg/kg	NC	35
6858546	Acid Extractable Strontium (Sr)	2020/07/28	108	75 - 125	102	75 - 125	<5.0	mg/kg	0.93	35
6858546	Acid Extractable Thallium (Tl)	2020/07/28	102	75 - 125	102	75 - 125	<0.10	mg/kg	NC	35
6858546	Acid Extractable Tin (Sn)	2020/07/28	100	75 - 125	102	75 - 125	<1.0	mg/kg	NC	35
6858546	Acid Extractable Uranium (U)	2020/07/28	106	75 - 125	106	75 - 125	<0.10	mg/kg	8.5	35
6858546	Acid Extractable Vanadium (V)	2020/07/28	84	75 - 125	104	75 - 125	<2.0	mg/kg	33	35
6858546	Acid Extractable Zinc (Zn)	2020/07/28	104	75 - 125	102	75 - 125	<5.0	mg/kg	1.1	35
6858606	Acid Extractable Aluminum (Al)	2020/07/28					<10	mg/kg	4.4	35
6858606	Acid Extractable Antimony (Sb)	2020/07/28	100	75 - 125	104	75 - 125	<2.0	mg/kg	NC	35
6858606	Acid Extractable Arsenic (As)	2020/07/28	NC	75 - 125	101	75 - 125	<2.0	mg/kg	2.7	35
6858606	Acid Extractable Barium (Ba)	2020/07/28	NC	75 - 125	99	75 - 125	<5.0	mg/kg	4.3	35
6858606	Acid Extractable Beryllium (Be)	2020/07/28	109	75 - 125	98	75 - 125	<2.0	mg/kg	NC	35

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6858606	Acid Extractable Bismuth (Bi)	2020/07/28	108	75 - 125	103	75 - 125	<2.0	mg/kg	2.7	35
6858606	Acid Extractable Boron (B)	2020/07/28	101	75 - 125	105	75 - 125	<50	mg/kg	NC	35
6858606	Acid Extractable Cadmium (Cd)	2020/07/28	107	75 - 125	96	75 - 125	<0.30	mg/kg	NC	35
6858606	Acid Extractable Chromium (Cr)	2020/07/28	107	75 - 125	97	75 - 125	<2.0	mg/kg	5.6	35
6858606	Acid Extractable Cobalt (Co)	2020/07/28	107	75 - 125	97	75 - 125	<1.0	mg/kg	6.8	35
6858606	Acid Extractable Copper (Cu)	2020/07/28	106	75 - 125	97	75 - 125	<2.0	mg/kg	1.1	35
6858606	Acid Extractable Iron (Fe)	2020/07/28					<50	mg/kg	1.7	35
6858606	Acid Extractable Lead (Pb)	2020/07/28	NC	75 - 125	98	75 - 125	<0.50	mg/kg	6.1	35
6858606	Acid Extractable Lithium (Li)	2020/07/28	117	75 - 125	101	75 - 125	<2.0	mg/kg	6.1	35
6858606	Acid Extractable Manganese (Mn)	2020/07/28	NC	75 - 125	98	75 - 125	<2.0	mg/kg	4.7	35
6858606	Acid Extractable Mercury (Hg)	2020/07/28	NC	75 - 125	105	75 - 125	<0.10	mg/kg	6.5	35
6858606	Acid Extractable Molybdenum (Mo)	2020/07/28	115	75 - 125	111	75 - 125	<2.0	mg/kg	NC	35
6858606	Acid Extractable Nickel (Ni)	2020/07/28	109	75 - 125	98	75 - 125	<2.0	mg/kg	0.050	35
6858606	Acid Extractable Rubidium (Rb)	2020/07/28	107	75 - 125	100	75 - 125	<2.0	mg/kg	2.9	35
6858606	Acid Extractable Selenium (Se)	2020/07/28	111	75 - 125	101	75 - 125	<0.50	mg/kg	NC	35
6858606	Acid Extractable Silver (Ag)	2020/07/28	110	75 - 125	99	75 - 125	<0.50	mg/kg	2.6	35
6858606	Acid Extractable Strontium (Sr)	2020/07/28	112	75 - 125	102	75 - 125	<5.0	mg/kg	NC	35
6858606	Acid Extractable Thallium (Tl)	2020/07/28	111	75 - 125	103	75 - 125	<0.10	mg/kg	6.5	35
6858606	Acid Extractable Tin (Sn)	2020/07/28	116	75 - 125	103	75 - 125	<1.0	mg/kg	24	35
6858606	Acid Extractable Uranium (U)	2020/07/28	115	75 - 125	102	75 - 125	<0.10	mg/kg	2.1	35
6858606	Acid Extractable Vanadium (V)	2020/07/28	113	75 - 125	99	75 - 125	<2.0	mg/kg	5.1	35
6858606	Acid Extractable Zinc (Zn)	2020/07/28	NC	75 - 125	100	75 - 125	<5.0	mg/kg	3.7	35
6861076	Acid Extractable Aluminum (Al)	2020/07/30					<10	mg/kg	6.0	35
6861076	Acid Extractable Antimony (Sb)	2020/07/30	110	75 - 125	107	75 - 125	<2.0	mg/kg	NC	35
6861076	Acid Extractable Arsenic (As)	2020/07/30	110	75 - 125	102	75 - 125	<2.0	mg/kg	7.6	35
6861076	Acid Extractable Barium (Ba)	2020/07/30	143 (1)	75 - 125	101	75 - 125	<5.0	mg/kg	29	35
6861076	Acid Extractable Beryllium (Be)	2020/07/30	113	75 - 125	103	75 - 125	<2.0	mg/kg	NC	35
6861076	Acid Extractable Bismuth (Bi)	2020/07/30	112	75 - 125	100	75 - 125	<2.0	mg/kg	NC	35
6861076	Acid Extractable Boron (B)	2020/07/30	102	75 - 125	104	75 - 125	<50	mg/kg	NC	35
6861076	Acid Extractable Cadmium (Cd)	2020/07/30	109	75 - 125	99	75 - 125	<0.30	mg/kg	NC	35
6861076	Acid Extractable Chromium (Cr)	2020/07/30	114	75 - 125	101	75 - 125	<2.0	mg/kg	4.3	35
6861076	Acid Extractable Cobalt (Co)	2020/07/30	110	75 - 125	98	75 - 125	<1.0	mg/kg	19	35

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6861076	Acid Extractable Copper (Cu)	2020/07/30	115	75 - 125	98	75 - 125	<2.0	mg/kg	5.2	35
6861076	Acid Extractable Iron (Fe)	2020/07/30					<50	mg/kg	0.87	35
6861076	Acid Extractable Lead (Pb)	2020/07/30	116	75 - 125	100	75 - 125	<0.50	mg/kg	5.3	35
6861076	Acid Extractable Lithium (Li)	2020/07/30	122	75 - 125	108	75 - 125	<2.0	mg/kg	11	35
6861076	Acid Extractable Manganese (Mn)	2020/07/30	NC	75 - 125	98	75 - 125	<2.0	mg/kg	21	35
6861076	Acid Extractable Mercury (Hg)	2020/07/30	103	75 - 125	97	75 - 125	<0.10	mg/kg	NC	35
6861076	Acid Extractable Molybdenum (Mo)	2020/07/30	118	75 - 125	103	75 - 125	<2.0	mg/kg	NC	35
6861076	Acid Extractable Nickel (Ni)	2020/07/30	113	75 - 125	100	75 - 125	<2.0	mg/kg	1.8	35
6861076	Acid Extractable Rubidium (Rb)	2020/07/30	104	75 - 125	96	75 - 125	<2.0	mg/kg	2.2	35
6861076	Acid Extractable Selenium (Se)	2020/07/30	109	75 - 125	101	75 - 125	<0.50	mg/kg	NC	35
6861076	Acid Extractable Silver (Ag)	2020/07/30	111	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
6861076	Acid Extractable Strontium (Sr)	2020/07/30	116	75 - 125	102	75 - 125	<5.0	mg/kg	24	35
6861076	Acid Extractable Thallium (Tl)	2020/07/30	111	75 - 125	100	75 - 125	<0.10	mg/kg	NC	35
6861076	Acid Extractable Tin (Sn)	2020/07/30	126 (2)	75 - 125	104	75 - 125	<1.0	mg/kg	NC	35
6861076	Acid Extractable Uranium (U)	2020/07/30	116	75 - 125	102	75 - 125	<0.10	mg/kg	0.038	35
6861076	Acid Extractable Vanadium (V)	2020/07/30	115	75 - 125	100	75 - 125	<2.0	mg/kg	4.1	35
6861076	Acid Extractable Zinc (Zn)	2020/07/30	NC	75 - 125	101	75 - 125	<5.0	mg/kg	2.3	35
6861133	Acid Extractable Aluminum (Al)	2020/07/31					<10	mg/kg	0.58	35
6861133	Acid Extractable Antimony (Sb)	2020/07/31	100	75 - 125	104	75 - 125	<2.0	mg/kg	NC	35
6861133	Acid Extractable Arsenic (As)	2020/07/31	NC	75 - 125	101	75 - 125	<2.0	mg/kg	0.95	35
6861133	Acid Extractable Barium (Ba)	2020/07/31	109	75 - 125	99	75 - 125	<5.0	mg/kg	0.18	35
6861133	Acid Extractable Beryllium (Be)	2020/07/31	110	75 - 125	102	75 - 125	<2.0	mg/kg	NC	35
6861133	Acid Extractable Bismuth (Bi)	2020/07/31	109	75 - 125	103	75 - 125	<2.0	mg/kg	NC	35
6861133	Acid Extractable Boron (B)	2020/07/31	105	75 - 125	104	75 - 125	<50	mg/kg	NC	35
6861133	Acid Extractable Cadmium (Cd)	2020/07/31	103	75 - 125	99	75 - 125	<0.30	mg/kg	NC	35
6861133	Acid Extractable Chromium (Cr)	2020/07/31	104	75 - 125	98	75 - 125	<2.0	mg/kg	2.4	35
6861133	Acid Extractable Cobalt (Co)	2020/07/31	104	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35
6861133	Acid Extractable Copper (Cu)	2020/07/31	108	75 - 125	97	75 - 125	<2.0	mg/kg	3.1	35
6861133	Acid Extractable Iron (Fe)	2020/07/31					<50	mg/kg	0.67	35
6861133	Acid Extractable Lead (Pb)	2020/07/31	107	75 - 125	99	75 - 125	<0.50	mg/kg	1.4	35
6861133	Acid Extractable Lithium (Li)	2020/07/31	112	75 - 125	105	75 - 125	<2.0	mg/kg	3.4	35
6861133	Acid Extractable Manganese (Mn)	2020/07/31	NC	75 - 125	101	75 - 125	<2.0	mg/kg	0.75	35

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6861133	Acid Extractable Mercury (Hg)	2020/07/31	NC	75 - 125	99	75 - 125	<0.10	mg/kg	0.17	35
6861133	Acid Extractable Molybdenum (Mo)	2020/07/31	113	75 - 125	97	75 - 125	<2.0	mg/kg	NC	35
6861133	Acid Extractable Nickel (Ni)	2020/07/31	107	75 - 125	101	75 - 125	<2.0	mg/kg	6.4	35
6861133	Acid Extractable Rubidium (Rb)	2020/07/31	105	75 - 125	97	75 - 125	<2.0	mg/kg	7.6	35
6861133	Acid Extractable Selenium (Se)	2020/07/31	106	75 - 125	102	75 - 125	<0.50	mg/kg	NC	35
6861133	Acid Extractable Silver (Ag)	2020/07/31	105	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
6861133	Acid Extractable Strontium (Sr)	2020/07/31	110	75 - 125	102	75 - 125	<5.0	mg/kg	NC	35
6861133	Acid Extractable Thallium (Tl)	2020/07/31	105	75 - 125	101	75 - 125	<0.10	mg/kg	7.2	35
6861133	Acid Extractable Tin (Sn)	2020/07/31	105	75 - 125	98	75 - 125	<1.0	mg/kg	7.5	35
6861133	Acid Extractable Uranium (U)	2020/07/31	111	75 - 125	101	75 - 125	<0.10	mg/kg	0.85	35
6861133	Acid Extractable Vanadium (V)	2020/07/31	109	75 - 125	100	75 - 125	<2.0	mg/kg	3.5	35
6861133	Acid Extractable Zinc (Zn)	2020/07/31	108	75 - 125	104	75 - 125	<5.0	mg/kg	3.5	35

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.

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) Matrix Spike exceeds acceptance limits, sample inhomogeneity suspected.

(2) Recovery is within QC acceptance limits. < 10 % of compounds in multi-component analysis in violation.

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BV Labs Job #: C0I8251
Report Date: 2020/07/31

Stantec Consulting Ltd
Client Project #: 121619250.2500.995
Sampler Initials: EA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Eric Dearman, Scientific Specialist

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

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Your Project #: 121619250.2500.995
Your C.O.C. #: 781593-03-01, 781593-04-01

Attention: Patrick Turner

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Report Date: 2020/08/10
Report #: R6286117
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C0J3507
Received: 2020/07/31, 09:44

Sample Matrix: Soil
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
TEH in Soil (PIRI) (1)	1	2020/07/31	2020/07/31	ATL SOP 00111	Atl. RBCA v3.1 m
Metals Solids Acid Extr. ICPMS	14	2020/08/04	2020/08/05	ATL SOP 00058	EPA 6020B R2 m
Metals Solids Acid Extr. ICPMS	1	2020/08/05	2020/08/05	ATL SOP 00058	EPA 6020B R2 m
Moisture	1	N/A	2020/08/04	ATL SOP 00001	OMOE Handbook 1983 m
VPH in Soil (PIRI) (2)	1	2020/07/31	2020/08/06	ATL SOP 00119	Atl. RBCA v3.1 m
ModTPH (T1) Calc. for Soil	1	N/A	2020/08/07	N/A	Atl. RBCA v3.1 m

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Mercury - Total (CVAA,LL)	5	2020/08/04	2020/08/04	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	1	2020/07/31	2020/08/01	ATL SOP 00058	EPA 6020B R2 m
Metals Water Total MS	4	2020/07/31	2020/08/04	ATL SOP 00058	EPA 6020B R2 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs 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 BV Labs, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Your Project #: 121619250.2500.995
Your C.O.C. #: 781593-03-01, 781593-04-01

Attention: Patrick Turner

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Report Date: 2020/08/10
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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.

(2) Sample(s) were not field preserved for VPH when received at the laboratory. Analytical results for VPH parameters should be regarded as minimum values.

Encryption Key

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

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

RBCA HYDROCARBONS IN SOIL (LAB PRES.)

BV Labs ID		NGG902	NGG902		
Sampling Date		2020/07/28 09:26	2020/07/28 09:26		
COC Number		781593-03-01	781593-03-01		
	UNITS	**SS20-03B**	**SS20-03B Lab-Dup**	**RDL**	**QC Batch**
Inorganics					
Moisture	%	68	N/A	1.0	6865856
Petroleum Hydrocarbons					
Benzene	mg/kg	<0.025	<0.025	0.025	6874375
Toluene	mg/kg	<0.050	<0.050	0.050	6874375
Ethylbenzene	mg/kg	<0.025	<0.025	0.025	6874375
Total Xylenes	mg/kg	<0.050	<0.050	0.050	6874375
C6 - C10 (less BTEX)	mg/kg	<2.5	<2.5	2.5	6874375
>C10-C16 Hydrocarbons	mg/kg	520	N/A	10	6866319
>C16-C21 Hydrocarbons	mg/kg	390	N/A	10	6866319
>C21-<C32 Hydrocarbons	mg/kg	1900	N/A	15	6866319
Modified TPH (Tier1)	mg/kg	2800	N/A	15	6865637
Reached Baseline at C32	mg/kg	No	N/A	N/A	6866319
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	N/A	N/A	6866319
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	85	N/A	N/A	6866319
n-Dotriacontane - Extractable	%	109	N/A	N/A	6866319
Isobutylbenzene - Volatile	%	106	113	N/A	6874375

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Weathered fuel oil fraction. Lube oil fraction.

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NGG899	NGG900		NGG901	NGG902		NGG903		
Sampling Date		2020/07/28 14:38	2020/07/28 14:08		2020/07/28 09:05	2020/07/28 09:26		2020/07/28 08:33		
COC Number		781593-03-01	781593-03-01		781593-03-01	781593-03-01		781593-03-01		
	UNITS	**TP20-104**	**SS20-01**	**RDL**	**SS20-02B**	**SS20-03B**	**RDL**	**SS20-04**	**RDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	20000	23000	10	21000	21000	10	21000	10	6869148
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	2.0	<2.0	<2.0	2.0	<2.0	2.0	6869148
Acid Extractable Arsenic (As)	mg/kg	14	450	2.0	570	560	20	110	2.0	6869148
Acid Extractable Barium (Ba)	mg/kg	43	84	5.0	43	93	5.0	25	5.0	6869148
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	2.0	<2.0	<2.0	2.0	<2.0	2.0	6869148
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	2.0	2.3	<2.0	2.0	<2.0	2.0	6869148
Acid Extractable Boron (B)	mg/kg	<50	<50	50	<50	<50	50	<50	50	6869148
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.92	0.30	<0.30	5.0	0.30	<0.30	0.30	6869148
Acid Extractable Chromium (Cr)	mg/kg	38	56	2.0	29	30	2.0	24	2.0	6869148
Acid Extractable Cobalt (Co)	mg/kg	7.7	30	1.0	15	20	1.0	4.4	1.0	6869148
Acid Extractable Copper (Cu)	mg/kg	3.3	62	2.0	75	43	2.0	11	2.0	6869148
Acid Extractable Iron (Fe)	mg/kg	32000	38000	50	42000	42000	50	28000	50	6869148
Acid Extractable Lead (Pb)	mg/kg	6.1	50	0.50	71	410	0.50	12	0.50	6869148
Acid Extractable Lithium (Li)	mg/kg	27	39	2.0	32	40	2.0	19	2.0	6869148
Acid Extractable Manganese (Mn)	mg/kg	280	850	2.0	440	990	2.0	230	2.0	6869148
Acid Extractable Mercury (Hg)	mg/kg	<0.10	0.77	0.10	7.5	0.31	0.10	0.15	0.10	6869148
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	7.2	2.0	<2.0	<2.0	2.0	<2.0	2.0	6869148
Acid Extractable Nickel (Ni)	mg/kg	19	65	2.0	37	42	2.0	11	2.0	6869148
Acid Extractable Rubidium (Rb)	mg/kg	15	15	2.0	34	28	2.0	7.9	2.0	6869148
Acid Extractable Selenium (Se)	mg/kg	<0.50	1.5	0.50	<0.50	0.55	0.50	1.2	0.50	6869148
Acid Extractable Silver (Ag)	mg/kg	<0.50	8.2	0.50	0.64	<0.50	0.50	<0.50	0.50	6869148
Acid Extractable Strontium (Sr)	mg/kg	<5.0	39	5.0	7.9	39	5.0	7.7	5.0	6869148
Acid Extractable Thallium (Tl)	mg/kg	0.11	0.25	0.10	0.38	0.26	0.10	0.11	0.10	6869148
Acid Extractable Tin (Sn)	mg/kg	1.2	1.1	1.0	<1.0	<1.0	1.0	<1.0	1.0	6869148
Acid Extractable Uranium (U)	mg/kg	0.46	2.0	0.10	0.64	1.3	0.10	0.63	0.10	6869148
Acid Extractable Vanadium (V)	mg/kg	54	34	2.0	31	33	2.0	43	2.0	6869148
Acid Extractable Zinc (Zn)	mg/kg	51	200	5.0	100	1000	5.0	44	5.0	6869148

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NGG904	NGG905		NGG906		NGG907	NGG908		
Sampling Date		2020/07/28 08:47	2020/07/28 10:30		2020/07/28 12:03		2020/07/28 12:30	2020/07/28 14:30		
COC Number		781593-03-01	781593-03-01		781593-03-01		781593-03-01	781593-03-01		
	UNITS	**SS20-05**	**SS20-06**	**RDL**	**SS20-07**	**RDL**	**SS20-08**	**SS20-09**	**RDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	17000	34000	10	22000	10	14000	9100	10	6869148
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	2.0	2.6	2.0	<2.0	<2.0	2.0	6869148
Acid Extractable Arsenic (As)	mg/kg	180	42	2.0	2800	20	38	3.1	2.0	6869148
Acid Extractable Barium (Ba)	mg/kg	120	61	5.0	1300	5.0	35	23	5.0	6869148
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	2.0	<2.0	2.0	<2.0	<2.0	2.0	6869148
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	2.0	<2.0	2.0	<2.0	<2.0	2.0	6869148
Acid Extractable Boron (B)	mg/kg	<50	<50	50	<50	50	<50	<50	50	6869148
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.54	0.30	1.9	0.30	<0.30	<0.30	0.30	6869148
Acid Extractable Chromium (Cr)	mg/kg	24	42	2.0	6.7	2.0	21	12	2.0	6869148
Acid Extractable Cobalt (Co)	mg/kg	9.8	22	1.0	1500	10	7.9	2.8	1.0	6869148
Acid Extractable Copper (Cu)	mg/kg	16	27	2.0	12	2.0	13	<2.0	2.0	6869148
Acid Extractable Iron (Fe)	mg/kg	23000	55000	50	200000	500	22000	9800	50	6869148
Acid Extractable Lead (Pb)	mg/kg	9.7	4.3	0.50	340	0.50	10	8.0	0.50	6869148
Acid Extractable Lithium (Li)	mg/kg	30	67	2.0	16	2.0	30	9.6	2.0	6869148
Acid Extractable Manganese (Mn)	mg/kg	360	670	2.0	290000	20	340	120	2.0	6869148
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	0.10	0.11	0.10	<0.10	<0.10	0.10	6869148
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	2.0	43	2.0	<2.0	<2.0	2.0	6869148
Acid Extractable Nickel (Ni)	mg/kg	20	53	2.0	40	2.0	18	6.8	2.0	6869148
Acid Extractable Rubidium (Rb)	mg/kg	14	10	2.0	3.1	2.0	13	6.2	2.0	6869148
Acid Extractable Selenium (Se)	mg/kg	<0.50	0.68	0.50	1.3	0.50	<0.50	<0.50	0.50	6869148
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	0.50	<0.50	0.50	<0.50	<0.50	0.50	6869148
Acid Extractable Strontium (Sr)	mg/kg	8.7	12	5.0	<5.0	5.0	10	6.3	5.0	6869148
Acid Extractable Thallium (Tl)	mg/kg	0.12	0.32	0.10	14	0.10	0.11	0.10	0.10	6869148
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	1.0	<1.0	1.0	<1.0	<1.0	1.0	6869148
Acid Extractable Uranium (U)	mg/kg	0.73	1.6	0.10	0.94	0.10	0.73	0.42	0.10	6869148
Acid Extractable Vanadium (V)	mg/kg	27	42	2.0	340	2.0	23	14	2.0	6869148
Acid Extractable Zinc (Zn)	mg/kg	54	150	5.0	88	5.0	48	26	5.0	6869148

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		NGG918	NGG919	NGG920	NGG921		NGG922		
Sampling Date		2020/07/28 08:33	2020/07/29 08:50	2020/07/29 09:34	2020/07/29 09:58		2020/07/29 10:13		
COC Number		781593-04-01	781593-04-01	781593-04-01	781593-04-01		781593-04-01		
	UNITS	**SS20-DUP6**	**SS20-11**	**SS20-14**	**SS20-15**	**QC Batch**	**SS20-16**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	21000	8000	23000	23000	6869148	17000	10	6871660
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	6869148	<2.0	2.0	6871660
Acid Extractable Arsenic (As)	mg/kg	120	7.1	75	4.5	6869148	5.1	2.0	6871660
Acid Extractable Barium (Ba)	mg/kg	26	35	44	64	6869148	37	5.0	6871660
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	6869148	<2.0	2.0	6871660
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	6869148	<2.0	2.0	6871660
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	6869148	<50	50	6871660
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.30	<0.30	<0.30	6869148	<0.30	0.30	6871660
Acid Extractable Chromium (Cr)	mg/kg	24	8.0	31	32	6869148	21	2.0	6871660
Acid Extractable Cobalt (Co)	mg/kg	4.5	2.3	6.2	8.3	6869148	4.5	1.0	6871660
Acid Extractable Copper (Cu)	mg/kg	9.9	12	17	12	6869148	6.9	2.0	6871660
Acid Extractable Iron (Fe)	mg/kg	28000	4300	24000	22000	6869148	14000	50	6871660
Acid Extractable Lead (Pb)	mg/kg	12	13	17	7.8	6869148	8.4	0.50	6871660
Acid Extractable Lithium (Li)	mg/kg	21	3.0	27	36	6869148	19	2.0	6871660
Acid Extractable Manganese (Mn)	mg/kg	250	89	240	260	6869148	170	2.0	6871660
Acid Extractable Mercury (Hg)	mg/kg	0.12	0.20	0.13	<0.10	6869148	0.12	0.10	6871660
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	6869148	<2.0	2.0	6871660
Acid Extractable Nickel (Ni)	mg/kg	12	9.5	16	20	6869148	11	2.0	6871660
Acid Extractable Rubidium (Rb)	mg/kg	9.0	2.2	14	19	6869148	9.7	2.0	6871660
Acid Extractable Selenium (Se)	mg/kg	1.2	2.4	1.2	0.64	6869148	1.5	0.50	6871660
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	6869148	<0.50	0.50	6871660
Acid Extractable Strontium (Sr)	mg/kg	7.2	17	7.1	<5.0	6869148	5.3	5.0	6871660
Acid Extractable Thallium (Tl)	mg/kg	0.11	<0.10	0.16	0.15	6869148	<0.10	0.10	6871660
Acid Extractable Tin (Sn)	mg/kg	<1.0	1.0	1.1	<1.0	6869148	<1.0	1.0	6871660
Acid Extractable Uranium (U)	mg/kg	0.63	0.83	0.65	1.1	6869148	0.83	0.10	6871660
Acid Extractable Vanadium (V)	mg/kg	41	5.8	42	37	6869148	22	2.0	6871660
Acid Extractable Zinc (Zn)	mg/kg	37	24	53	48	6869148	34	5.0	6871660

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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MERCURY BY COLD VAPOUR AA (WATER)

BV Labs ID		NGG923	NGG924	NGG925	NGG926	NGG927		
Sampling Date		2020/07/28 10:10	2020/07/28 10:45	2020/07/28 11:45	2020/07/28 13:15	2020/07/28 14:15		
COC Number		781593-04-01	781593-04-01	781593-04-01	781593-04-01	781593-04-01		
	UNITS	**SW20-01**	**SW20-02**	**SW20-03**	**SW20-04**	**SW20-05**	**RDL**	**QC Batch**
Metals								
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	6869033

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ELEMENTS BY ICP/MS (WATER)

BV Labs ID		NGG923	NGG924	NGG925	NGG926	NGG927		
Sampling Date		2020/07/28 10:10	2020/07/28 10:45	2020/07/28 11:45	2020/07/28 13:15	2020/07/28 14:15		
COC Number		781593-04-01	781593-04-01	781593-04-01	781593-04-01	781593-04-01		
	UNITS	**SW20-01**	**SW20-02**	**SW20-03**	**SW20-04**	**SW20-05**	**RDL**	**QC Batch**
Metals								
Total Aluminum (Al)	ug/L	280	46	270	260	280	5.0	6866140
Total Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6866140
Total Arsenic (As)	ug/L	4.5	45	1.5	4.4	2.1	1.0	6866140
Total Barium (Ba)	ug/L	4.8	4.1	3.5	3.4	3.0	1.0	6866140
Total Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6866140
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6866140
Total Boron (B)	ug/L	<50	<50	<50	<50	<50	50	6866140
Total Cadmium (Cd)	ug/L	0.014	<0.010	0.016	0.015	0.014	0.010	6866140
Total Calcium (Ca)	ug/L	1000	3000	730	820	810	100	6866140
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6866140
Total Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6866140
Total Copper (Cu)	ug/L	0.53	0.54	<0.50	0.80	0.54	0.50	6866140
Total Iron (Fe)	ug/L	740	1000	780	680	710	50	6866140
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	0.50	6866140
Total Magnesium (Mg)	ug/L	400	650	370	380	340	100	6866140
Total Manganese (Mn)	ug/L	50	110	41	44	29	2.0	6866140
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6866140
Total Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6866140
Total Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	100	6866140
Total Potassium (K)	ug/L	190	400	160	180	210	100	6866140
Total Selenium (Se)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6866140
Total Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6866140
Total Sodium (Na)	ug/L	2400	1700	2300	2300	2100	100	6866140
Total Strontium (Sr)	ug/L	8.0	20	6.2	7.3	5.6	2.0	6866140
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6866140
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6866140
Total Titanium (Ti)	ug/L	3.8	2.2	2.8	3.0	3.1	2.0	6866140
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6866140
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6866140
Total Zinc (Zn)	ug/L	26	<5.0	<5.0	<5.0	<5.0	5.0	6866140

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

BV Labs ID: NGG899 **Collected:** 2020/07/28
Sample ID: TP20-104 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG900 **Collected:** 2020/07/28
Sample ID: SS20-01 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG901 **Collected:** 2020/07/28
Sample ID: SS20-02B **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG902 **Collected:** 2020/07/28
Sample ID: SS20-03B **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
TEH in Soil (PIRI)	GC/FID	6866319	2020/07/31	2020/07/31	David Balfour
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine
Moisture	BAL	6865856	N/A	2020/08/04	Kayla Burgess
VPH in Soil (PIRI)	PTGC/MS	6874375	2020/07/31	2020/08/06	Shawn Helmkay
ModTPH (T1) Calc. for Soil	CALC	6865637	N/A	2020/08/07	Automated Statchk

BV Labs ID: NGG902 Dup **Collected:** 2020/07/28
Sample ID: SS20-03B **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VPH in Soil (PIRI)	PTGC/MS	6874375	2020/07/31	2020/08/06	Shawn Helmkay

BV Labs ID: NGG903 **Collected:** 2020/07/28
Sample ID: SS20-04 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG904 **Collected:** 2020/07/28
Sample ID: SS20-05 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NGG905 **Collected:** 2020/07/28
Sample ID: SS20-06 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG906 **Collected:** 2020/07/28
Sample ID: SS20-07 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG907 **Collected:** 2020/07/28
Sample ID: SS20-08 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG908 **Collected:** 2020/07/28
Sample ID: SS20-09 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG918 **Collected:** 2020/07/28
Sample ID: SS20-DUP6 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG919 **Collected:** 2020/07/29
Sample ID: SS20-11 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG920 **Collected:** 2020/07/29
Sample ID: SS20-14 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

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TEST SUMMARY

BV Labs ID: NGG921 **Collected:** 2020/07/29
Sample ID: SS20-15 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6869148	2020/08/04	2020/08/05	Bryon Angevine

BV Labs ID: NGG922 **Collected:** 2020/07/29
Sample ID: SS20-16 **Shipped:**
Matrix: Soil **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6871660	2020/08/05	2020/08/05	Bryon Angevine

BV Labs ID: NGG923 **Collected:** 2020/07/28
Sample ID: SW20-01 **Shipped:**
Matrix: Water **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury - Total (CVAA,LL)	CV/AA	6869033	2020/08/04	2020/08/04	Nicholas Hutchinson
Metals Water Total MS	CICP/MS	6866140	2020/07/31	2020/08/04	Stacy Joseph

BV Labs ID: NGG924 **Collected:** 2020/07/28
Sample ID: SW20-02 **Shipped:**
Matrix: Water **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury - Total (CVAA,LL)	CV/AA	6869033	2020/08/04	2020/08/04	Nicholas Hutchinson
Metals Water Total MS	CICP/MS	6866140	2020/07/31	2020/08/01	Stacy Joseph

BV Labs ID: NGG925 **Collected:** 2020/07/28
Sample ID: SW20-03 **Shipped:**
Matrix: Water **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury - Total (CVAA,LL)	CV/AA	6869033	2020/08/04	2020/08/04	Nicholas Hutchinson
Metals Water Total MS	CICP/MS	6866140	2020/07/31	2020/08/04	Stacy Joseph

BV Labs ID: NGG926 **Collected:** 2020/07/28
Sample ID: SW20-04 **Shipped:**
Matrix: Water **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury - Total (CVAA,LL)	CV/AA	6869033	2020/08/04	2020/08/04	Nicholas Hutchinson
Metals Water Total MS	CICP/MS	6866140	2020/07/31	2020/08/04	Stacy Joseph

BV Labs ID: NGG927 **Collected:** 2020/07/28
Sample ID: SW20-05 **Shipped:**
Matrix: Water **Received:** 2020/07/31

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury - Total (CVAA,LL)	CV/AA	6869033	2020/08/04	2020/08/04	Nicholas Hutchinson
Metals Water Total MS	CICP/MS	6866140	2020/07/31	2020/08/04	Stacy Joseph

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GENERAL COMMENTS

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

Package 1	13.7°C
Package 2	14.3°C

SS20-03B headspace present in soil jar before sample was lab methanol preserved. 2020/07/31 MMC

Results relate only to the items tested.

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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6866319	Isobutylbenzene - Extractable	2020/07/31	88	60 - 130	90	60 - 130	85	%		
6866319	n-Dotriacontane - Extractable	2020/07/31	106	60 - 130	111	60 - 130	110	%		
6874375	Isobutylbenzene - Volatile	2020/08/06	112	60 - 130	104	60 - 130	103	%		
6865856	Moisture	2020/08/04							0	25
6866140	Total Aluminum (Al)	2020/08/01	104	80 - 120	99	80 - 120	<5.0	ug/L	2.8	20
6866140	Total Antimony (Sb)	2020/08/01	102	80 - 120	101	80 - 120	<1.0	ug/L	NC	20
6866140	Total Arsenic (As)	2020/08/01	92	80 - 120	93	80 - 120	<1.0	ug/L	NC	20
6866140	Total Barium (Ba)	2020/08/01	94	80 - 120	95	80 - 120	<1.0	ug/L	3.2	20
6866140	Total Beryllium (Be)	2020/08/01	95	80 - 120	95	80 - 120	<1.0	ug/L	NC	20
6866140	Total Bismuth (Bi)	2020/08/01	98	80 - 120	98	80 - 120	<2.0	ug/L	NC	20
6866140	Total Boron (B)	2020/08/01	93	80 - 120	93	80 - 120	<50	ug/L	NC	20
6866140	Total Cadmium (Cd)	2020/08/01	95	80 - 120	94	80 - 120	<0.010	ug/L	NC	20
6866140	Total Calcium (Ca)	2020/08/01	103	80 - 120	102	80 - 120	<100	ug/L	2.2	20
6866140	Total Chromium (Cr)	2020/08/01	97	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
6866140	Total Cobalt (Co)	2020/08/01	94	80 - 120	96	80 - 120	<0.40	ug/L	NC	20
6866140	Total Copper (Cu)	2020/08/01	93	80 - 120	95	80 - 120	<0.50	ug/L	NC	20
6866140	Total Iron (Fe)	2020/08/01	104	80 - 120	101	80 - 120	<50	ug/L	4.4	20
6866140	Total Lead (Pb)	2020/08/01	98	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
6866140	Total Magnesium (Mg)	2020/08/01	101	80 - 120	102	80 - 120	<100	ug/L	1.2	20
6866140	Total Manganese (Mn)	2020/08/01	97	80 - 120	99	80 - 120	<2.0	ug/L	1.5	20
6866140	Total Molybdenum (Mo)	2020/08/01	102	80 - 120	99	80 - 120	<2.0	ug/L	NC	20
6866140	Total Nickel (Ni)	2020/08/01	94	80 - 120	97	80 - 120	<2.0	ug/L	NC	20
6866140	Total Phosphorus (P)	2020/08/01	101	80 - 120	101	80 - 120	<100	ug/L	NC	20
6866140	Total Potassium (K)	2020/08/01	98	80 - 120	96	80 - 120	<100	ug/L	2.0	20
6866140	Total Selenium (Se)	2020/08/01	95	80 - 120	91	80 - 120	<0.50	ug/L	NC	20
6866140	Total Silver (Ag)	2020/08/01	96	80 - 120	96	80 - 120	<0.10	ug/L	NC	20
6866140	Total Sodium (Na)	2020/08/01	93	80 - 120	94	80 - 120	<100	ug/L	2.0	20
6866140	Total Strontium (Sr)	2020/08/01	98	80 - 120	101	80 - 120	<2.0	ug/L	4.8	20
6866140	Total Thallium (Tl)	2020/08/01	98	80 - 120	97	80 - 120	<0.10	ug/L	NC	20
6866140	Total Tin (Sn)	2020/08/01	104	80 - 120	100	80 - 120	<2.0	ug/L	NC	20
6866140	Total Titanium (Ti)	2020/08/01	98	80 - 120	96	80 - 120	<2.0	ug/L	NC	20
6866140	Total Uranium (U)	2020/08/01	106	80 - 120	105	80 - 120	<0.10	ug/L	NC	20
6866140	Total Vanadium (V)	2020/08/01	99	80 - 120	99	80 - 120	<2.0	ug/L	NC	20

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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6866140	Total Zinc (Zn)	2020/08/01	93	80 - 120	95	80 - 120	<5.0	ug/L	NC	20
6866319	>C10-C16 Hydrocarbons	2020/07/31	91	30 - 130	92	60 - 130	<10	mg/kg	NC	50
6866319	>C16-C21 Hydrocarbons	2020/07/31	87	30 - 130	87	60 - 130	<10	mg/kg	NC	50
6866319	>C21-<C32 Hydrocarbons	2020/07/31	122	30 - 130	126	60 - 130	<15	mg/kg	NC	50
6869033	Total Mercury (Hg)	2020/08/04	97	80 - 120	102	80 - 120	<0.013	ug/L	NC	20
6869148	Acid Extractable Aluminum (Al)	2020/08/05					<10	mg/kg	0.60	35
6869148	Acid Extractable Antimony (Sb)	2020/08/05	104	75 - 125	101	75 - 125	<2.0	mg/kg	5.2	35
6869148	Acid Extractable Arsenic (As)	2020/08/05	107	75 - 125	100	75 - 125	<2.0	mg/kg	3.3	35
6869148	Acid Extractable Barium (Ba)	2020/08/05	NC	75 - 125	99	75 - 125	<5.0	mg/kg	4.1	35
6869148	Acid Extractable Beryllium (Be)	2020/08/05	108	75 - 125	98	75 - 125	<2.0	mg/kg	NC	35
6869148	Acid Extractable Bismuth (Bi)	2020/08/05	109	75 - 125	101	75 - 125	<2.0	mg/kg	NC	35
6869148	Acid Extractable Boron (B)	2020/08/05	106	75 - 125	99	75 - 125	<50	mg/kg	NC	35
6869148	Acid Extractable Cadmium (Cd)	2020/08/05	106	75 - 125	97	75 - 125	<0.30	mg/kg	4.1	35
6869148	Acid Extractable Chromium (Cr)	2020/08/05	105	75 - 125	99	75 - 125	<2.0	mg/kg	9.2	35
6869148	Acid Extractable Cobalt (Co)	2020/08/05	102	75 - 125	99	75 - 125	<1.0	mg/kg	7.8	35
6869148	Acid Extractable Copper (Cu)	2020/08/05	NC	75 - 125	99	75 - 125	<2.0	mg/kg	8.7	35
6869148	Acid Extractable Iron (Fe)	2020/08/05					<50	mg/kg	6.6	35
6869148	Acid Extractable Lead (Pb)	2020/08/05	NC	75 - 125	103	75 - 125	<0.50	mg/kg	2.3	35
6869148	Acid Extractable Lithium (Li)	2020/08/05	111	75 - 125	100	75 - 125	<2.0	mg/kg	0.40	35
6869148	Acid Extractable Manganese (Mn)	2020/08/05	NC	75 - 125	100	75 - 125	<2.0	mg/kg	5.8	35
6869148	Acid Extractable Mercury (Hg)	2020/08/05	99	75 - 125	103	75 - 125	<0.10	mg/kg	26	35
6869148	Acid Extractable Molybdenum (Mo)	2020/08/05	101	75 - 125	99	75 - 125	<2.0	mg/kg	12	35
6869148	Acid Extractable Nickel (Ni)	2020/08/05	105	75 - 125	101	75 - 125	<2.0	mg/kg	6.8	35
6869148	Acid Extractable Rubidium (Rb)	2020/08/05	106	75 - 125	99	75 - 125	<2.0	mg/kg	6.7	35
6869148	Acid Extractable Selenium (Se)	2020/08/05	104	75 - 125	101	75 - 125	<0.50	mg/kg	NC	35
6869148	Acid Extractable Silver (Ag)	2020/08/05	107	75 - 125	99	75 - 125	<0.50	mg/kg	9.2	35
6869148	Acid Extractable Strontium (Sr)	2020/08/05	NC	75 - 125	105	75 - 125	<5.0	mg/kg	7.0	35
6869148	Acid Extractable Thallium (Tl)	2020/08/05	94	75 - 125	103	75 - 125	<0.10	mg/kg	1.2	35
6869148	Acid Extractable Tin (Sn)	2020/08/05	106	75 - 125	100	75 - 125	<1.0	mg/kg	NC	35
6869148	Acid Extractable Uranium (U)	2020/08/05	108	75 - 125	103	75 - 125	<0.10	mg/kg	17	35
6869148	Acid Extractable Vanadium (V)	2020/08/05	108	75 - 125	101	75 - 125	<2.0	mg/kg	7.2	35
6869148	Acid Extractable Zinc (Zn)	2020/08/05	NC	75 - 125	101	75 - 125	<5.0	mg/kg	6.5	35
6871660	Acid Extractable Aluminum (Al)	2020/08/05					<10	mg/kg	9.3	35

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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6871660	Acid Extractable Antimony (Sb)	2020/08/05	102	75 - 125	107	75 - 125	<2.0	mg/kg	NC	35
6871660	Acid Extractable Arsenic (As)	2020/08/05	99	75 - 125	100	75 - 125	<2.0	mg/kg	12	35
6871660	Acid Extractable Barium (Ba)	2020/08/05	103	75 - 125	100	75 - 125	<5.0	mg/kg	13	35
6871660	Acid Extractable Beryllium (Be)	2020/08/05	99	75 - 125	94	75 - 125	<2.0	mg/kg	NC	35
6871660	Acid Extractable Bismuth (Bi)	2020/08/05	105	75 - 125	101	75 - 125	<2.0	mg/kg	NC	35
6871660	Acid Extractable Boron (B)	2020/08/05	90	75 - 125	100	75 - 125	<50	mg/kg	NC	35
6871660	Acid Extractable Cadmium (Cd)	2020/08/05	98	75 - 125	98	75 - 125	<0.30	mg/kg	NC	35
6871660	Acid Extractable Chromium (Cr)	2020/08/05	96	75 - 125	96	75 - 125	<2.0	mg/kg	4.3	35
6871660	Acid Extractable Cobalt (Co)	2020/08/05	98	75 - 125	95	75 - 125	<1.0	mg/kg	1.1	35
6871660	Acid Extractable Copper (Cu)	2020/08/05	94	75 - 125	93	75 - 125	<2.0	mg/kg	0.39	35
6871660	Acid Extractable Iron (Fe)	2020/08/05					<50	mg/kg	3.3	35
6871660	Acid Extractable Lead (Pb)	2020/08/05	102	75 - 125	100	75 - 125	<0.50	mg/kg	1.4	35
6871660	Acid Extractable Lithium (Li)	2020/08/05	105	75 - 125	103	75 - 125	<2.0	mg/kg	6.4	35
6871660	Acid Extractable Manganese (Mn)	2020/08/05	NC	75 - 125	98	75 - 125	<2.0	mg/kg	1.3	35
6871660	Acid Extractable Mercury (Hg)	2020/08/05	99	75 - 125	103	75 - 125	<0.10	mg/kg	NC	35
6871660	Acid Extractable Molybdenum (Mo)	2020/08/05	104	75 - 125	107	75 - 125	<2.0	mg/kg	NC	35
6871660	Acid Extractable Nickel (Ni)	2020/08/05	99	75 - 125	97	75 - 125	<2.0	mg/kg	5.5	35
6871660	Acid Extractable Rubidium (Rb)	2020/08/05	99	75 - 125	99	75 - 125	<2.0	mg/kg	13	35
6871660	Acid Extractable Selenium (Se)	2020/08/05	97	75 - 125	98	75 - 125	<0.50	mg/kg	12	35
6871660	Acid Extractable Silver (Ag)	2020/08/05	102	75 - 125	102	75 - 125	<0.50	mg/kg	NC	35
6871660	Acid Extractable Strontium (Sr)	2020/08/05	105	75 - 125	104	75 - 125	<5.0	mg/kg	NC	35
6871660	Acid Extractable Thallium (Tl)	2020/08/05	103	75 - 125	102	75 - 125	<0.10	mg/kg	1.8	35
6871660	Acid Extractable Tin (Sn)	2020/08/05	105	75 - 125	104	75 - 125	<1.0	mg/kg	24	35
6871660	Acid Extractable Uranium (U)	2020/08/05	111	75 - 125	100	75 - 125	<0.10	mg/kg	4.9	35
6871660	Acid Extractable Vanadium (V)	2020/08/05	97	75 - 125	98	75 - 125	<2.0	mg/kg	5.8	35
6871660	Acid Extractable Zinc (Zn)	2020/08/05	100	75 - 125	97	75 - 125	<5.0	mg/kg	1.5	35
6874375	Benzene	2020/08/06	114	60 - 130	91	60 - 140	<0.025	mg/kg	NC	50
6874375	C6 - C10 (less BTEX)	2020/08/06					<2.5	mg/kg	NC	50
6874375	Ethylbenzene	2020/08/06	111	60 - 130	80	60 - 140	<0.025	mg/kg	NC	50
6874375	Toluene	2020/08/06	109	60 - 130	85	60 - 140	<0.050	mg/kg	NC	50

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6874375	Total Xylenes	2020/08/06	120	60 - 130	90	60 - 140	<0.050	mg/kg	NC	50

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).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Eric Dearman, Scientific Specialist

Rosemarie MacDonald, Scientific Specialist (Organics)

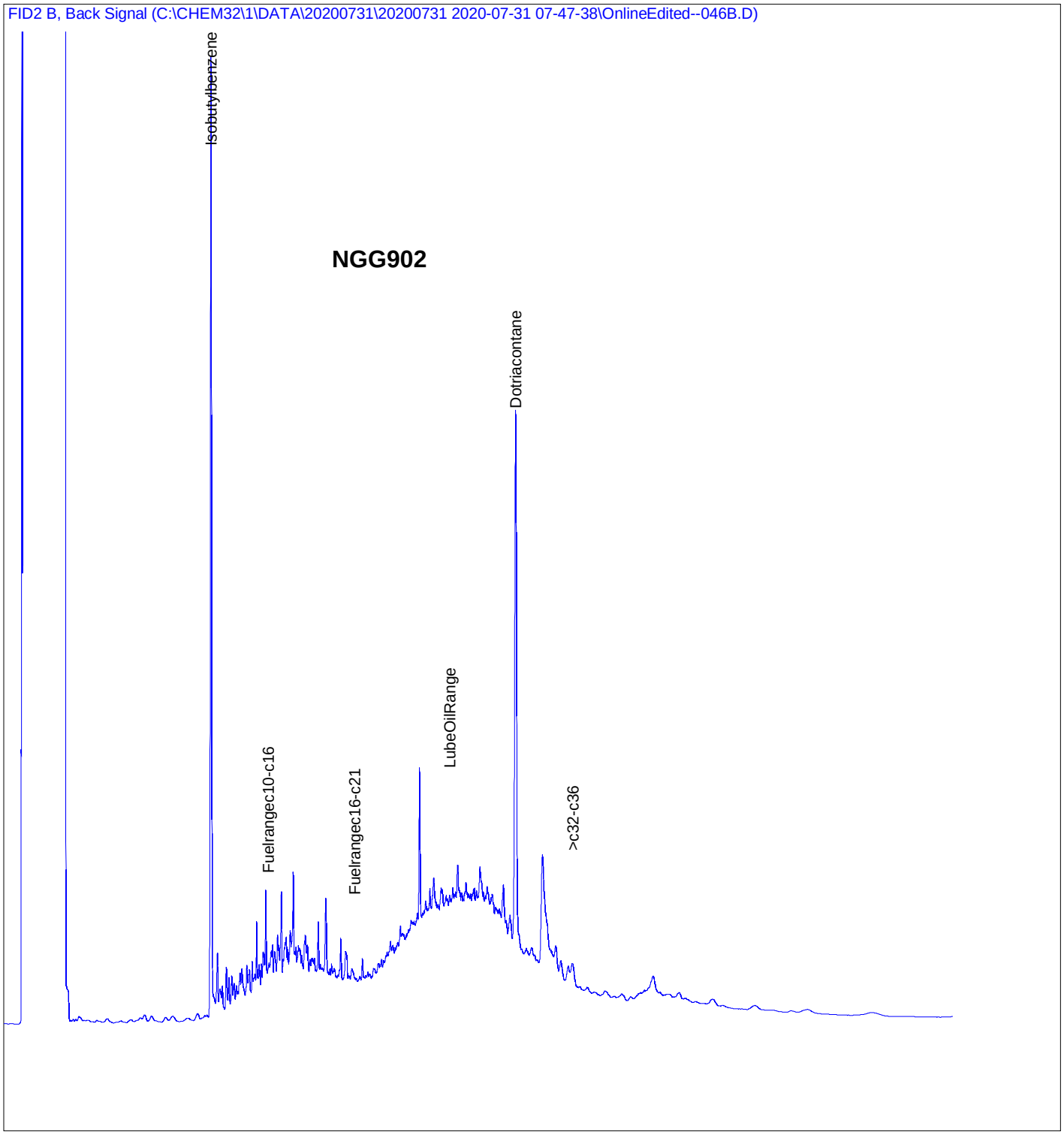
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 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.bvlabs.com

Print of window 38: Current Chromatogram(s)
Data File : C:\CHEM32\1\DATA\20200731\20200731 2020-07-31 07-47-38\OnlineEdited--046B.D
Sample Name : 6866319:NGG902-01

Acq. Operator : Bria Harvey Seq. Line : 46
Acq. Instrument : FID007 Location : 121 (B)
Injection Date : 2020/07/31 8:39:21 PM Inj : 1
Inj Volume : 2 µl
Acq. Method : C:\Chem32\1\Data\20200731\20200731 2020-07-31 07-47-38\runbakeh2.M
Last changed : 2020/07/31 7:47:38 AM by Bria Harvey
Analysis Method : C:\Chem32\1\Methods\TEHS-2.M
Last changed : 2020/08/04 8:35:37 AM by Bria Harvey
(modified after loading)

Current Chromatogram(s)



APPENDIX E

Photographs

Stantec

Photographic Log

Client:	**Atlantic Mining NS Inc.**	**Project:**	**Extended Phase II ESA**
Site Name:	**Beaver Dam Site**	**Site Location:**	**Marinette, NS**

Photograph ID: 1

Photo Location:
Modern buildings

Direction:
-

Survey Date:
7/22/2020

Comments:
Modern buildings at former camp site near Crusher Lake

Photograph ID: 2

Photo Location:
Cameron Flowage

Direction:
Northwest

Survey Date:
7/20/2020

Comments:
-

Client:	**Atlantic Mining NS Inc.**	**Project:**	**Extended Phase II ESA**
Site Name:	**Beaver Dam Site**	**Site Location:**	**Marinette, NS**

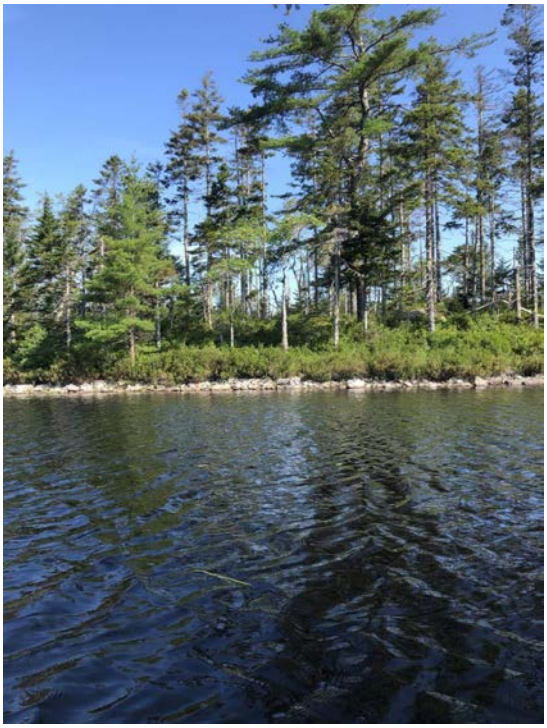
Photograph ID: 3

Photo Location:
Crusher Lake

Direction:
Northeast

Survey Date:
7/29/2020

Comments:
Rocky northeastern shore of Crusher Lake



Photograph ID: 4

Photo Location:
Dam

Direction:
Southeast

Survey Date:
7/20/2020

Comments:
Dam between Cameron Flowage and central historical settling pond area. Dam located east of proposed open pit.

Client:	**Atlantic Mining NS Inc.**	**Project:**	**Extended Phase II ESA**
Site Name:	**Beaver Dam Site**	**Site Location:**	**Marinette, NS**

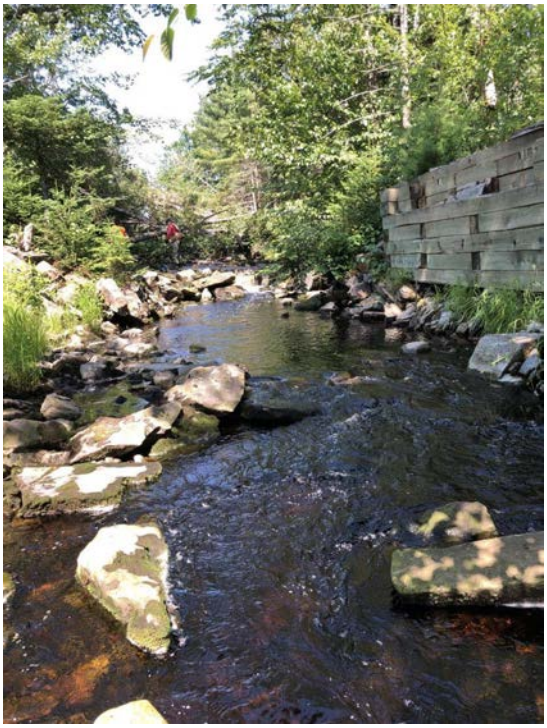
Photograph ID: 5

Photo Location:
Killag River

Direction:
West

Survey Date:
7/28/2020

Comments:
Embankment along river near SW20-03, west of proposed infrastructure areas



Photograph ID: 6

Photo Location:
Suspected pit shaft

Direction:
-

Survey Date:
7/23/2020

Comments:
Suspected pit shaft near TP20-26

Client:	**Atlantic Mining NS Inc.**	**Project:**	**Extended Phase II ESA**
Site Name:	**Beaver Dam Site**	**Site Location:**	**Marinette, NS**

Photograph ID: 7 **Photo Location:** SS20-03B **Direction:** - **Survey Date:** 7/28/2020 **Comments:** Sediment sample with hydrocarbon odour	
Photograph ID: 8 **Photo Location:** SS20-01 **Direction:** - **Survey Date:** 7/27/2020 **Comments:** Sheen on surface at SS20-01	

Client:	**Atlantic Mining NS Inc.**	**Project:**	**Extended Phase II ESA**
Site Name:	**Beaver Dam Site**	**Site Location:**	**Marinette, NS**

Photograph ID: 9 **Photo Location:** TP20-63 **Direction:** - **Survey Date:** 7/22/2020 **Comments:** Potential tailings in soil	
Photograph ID: 10 **Photo Location:** Waste rock **Direction:** - **Survey Date:** 7/23/2020 **Comments:** Waste rock pile under forest debris and vegetation near TP20-26	

Client:	**Atlantic Mining NS Inc.**	**Project:**	**Extended Phase II ESA**
Site Name:	**Beaver Dam Site**	**Site Location:**	**Marinette, NS**

Photograph ID: 11

Photo Location:
Waste rock

Direction:
-

Survey Date:
7/22/2020

Comments:
Waste rock pile near the 1928 Mill Shaft Pit

Photograph ID: 12

Photo Location:
TP20-27

Direction:
-

Survey Date:
7/23/2020

Comments:
Waste rock at surface

APPENDIX F

Soil Background Statistics and Methodology

Stantec

Memo

To:	Eric Arseneau, MES Stantec	From:	Gillian Manley, P.Eng. Stantec
File:	121619250.995	Date:	November 9, 2020

Reference: Beaver Dam – Methodology of Statistic Calculations for Investigating Background Level of Arsenic in Soil

INTRODUCTION

The Nova Scotia Contaminated Sites Regulations' (Nova Scotia Environment 2013a) Tier 1 Environmental Quality Standard (EQS) for arsenic for industrial land use is 31 mg/kg (Nova Scotia Environment 2013b). However, some samples from non-impacted areas of the Beaver Dam Project site (the Site) include arsenic concentrations higher than the Tier 1 EQS. Stantec considers the concentrations within non-impacted soil samples to represent potential data on background levels of arsenic in the Site area. Information on how soil was classified as impacted vs. non-impacted is included within the Extended Phase II ESA (Stantec 2020)

This memo presents analysis of arsenic data in non-impacted soil samples collected from the Site. Analysis includes statistical distribution tests and outlier tests to establish a reliable baseline data set, and the use of statistics to determine a representative background concentration of arsenic in soil at the Site.

METHODOLOGY

Stantec used the statistical support software ProUCL 5.1.00 published by the United States Environmental Protection Agency (US EPA) to test and generate statistics. ProUCL is used to establish background levels, determine outliers in data sets, and compare background and site sample data sets for site evaluation and risk assessment (US EPA Office of Research and Development 2016). Stantec used Microsoft Excel to tabulate and organize data sets for input to ProUCL, for visual inspection of data trends, and to verify basic statistics generated by ProUCL.

The data used for this analysis were collected as part of the Limited Phase II ESA (Stantec 2019) and Extended Phase II ESA (Stantec 2020) activities. The results from field and laboratory duplicate samples were removed from the dataset. The data used in the analysis included 52 samples, sorted, as shown in the attached *ProUCL Input A: Data – Metals in Soil* document under column header "All Non-Impacted Arsenic (mg/kg)".

NON-DETECTS

ProUCL is intended for data sets with or without non-detect observations (US EPA Office of Research and Development 2015). There is one non-detect observation within the data used for the current analysis: a concentration of <2.0 mg/kg is reported for sample TP20-03. Other samples used in the determination of the background level of arsenic in soil for this study were above the reported detection limit.

DISTRIBUTION TESTING

Distribution testing was conducted on this data set using ProUCL: specifically, the Shapiro-Wilk test to perform normal and lognormal goodness-of-fit testing (US EPA Office of Research and Development 2015).

Reference: **Beaver Dam – Methodology of Statistic Calculations for Investigating Background Level of Arsenic in Soil**

OUTLIER TESTING

Stantec used ProUCL to conduct outlier tests on the data set. The purpose of an outlier test is to evaluate if data points may not belong to the same statistical population as the general data set. As outliers are not representative of the population from which they are drawn, they may distort statistical calculations intended to represent the general background. Outliers are typical in data sets originating from environmental applications (US EPA Office of Research and Development 2015).

Outlier testing was performed using Rosner's outlier test based on significance levels of 1% and 5%.

STATISTICS

Stantec used ProUCL to generate statistics for the background data set. The mean and standard deviation were calculated using the Kaplan-Meier method, which yields good estimates of these metrics (US EPA Office of Research and Development 2015).

RESULTS

DISTRIBUTION TESTING

The result of the Shapiro-Wilk distribution test indicates that the data set does not follow a normal distribution and potentially follows a lognormal distribution based on the tests' p-values: less than 0.05 for the normal test and greater than 0.05 for the lognormal test as shown in the attached documents: *ProUCL Output A: Normal Q-Q Plot for All Non-Impacted Arsenic* and *ProUCL Output B: Lognormal Q-Q Plot for All Non-Impacted Arsenic*.

Spatial distributions of environmental and earth science data commonly fit lognormal distributions. The data sets are often skewed towards lower values, have asymmetrical distributions, and span several orders of magnitude (British Columbia Ministry of Environment & Climate Change Strategy 2001). The fit of the arsenic data to a lognormal distribution increases confidence that this data set belongs to one population for which representative statistics may be calculated. However, there is still uncertainty based on the number of samples in the data set and the general heterogenous nature of soil (i.e., the general tendency of soil to have small pockets of higher or lower chemical concentrations).

OUTLIER TESTING

No potential outliers were identified at both the 1% and 5% significance levels. The test result is shown in the attached *ProUCL Output C: Results of Outlier Testing (Arsenic)* document. The test replaces non-detects with half of the detection limit.

ProUCL uses Rosner's outlier test, which is appropriate for approximately normal distributions (US EPA Office of Research and Development 2015). As discussed above, the arsenic data set is lognormal rather than normal, so ProUCL's outlier test is not ideal for this data set; however, it is included for information purposes. (Outlier tests should be performed on raw data sets (i.e., not log-transformed data sets) for environmental applications (US EPA Office of Research and Development 2015).)

Reference: **Beaver Dam – Methodology of Statistic Calculations for Investigating Background Level of Arsenic in Soil**

STATISTICS

The statistics for arsenic concentrations in soil at the Site calculated using ProUCL are shown in the attached *ProUCL Output D: Statistics* document and summarized in Table 1 below. Additional discussion of the application of these statistics to Site background classification is included within the Extended Phase II ESA (Stantec 2021).

Table 1 Statistics

Concentration (mg/kg)	Maximum	Mean	Median	Standard Deviation	75th Percentile	95th Percentile
Arsenic	270	75.34	43.5	74.9	112.5	228.0

CONCLUSIONS

Stantec compiled a data set of arsenic concentrations in non-impacted Site soil. This data set was used to generate background statistics for the Site as presented above.

This memo should be read in conjunction with Stantec's Extended Phase II Environmental Site Assessment (ESA) (Stantec 2021).

STANTEC CONSULTING LTD.

Gillian Manley P.Eng.
Environmental Engineer

Phone: 902-468-7777
gillian.manley@stantec.com

Attachment:
ProUCL Input A: Data – Metals in Soil
ProUCL Output A: Normal Q-Q Plot for All Non-Impacted Arsenic
ProUCL Output B: Lognormal Q-Q Plot for All Non-Impacted Arsenic.
ProUCL Output C: Results of Outlier Testing (Arsenic)
ProUCL Output D: Statistics

\\ca0214-ppfss01\workgroup\1216\active\121619250\2_environmental\8_reports\2500.995_beaver_dam_extended_phase_ii\report_deliverable\deliverable_202102\appendix_f_stats\mem_fnl_statistics_metholodogy_20201106.docx

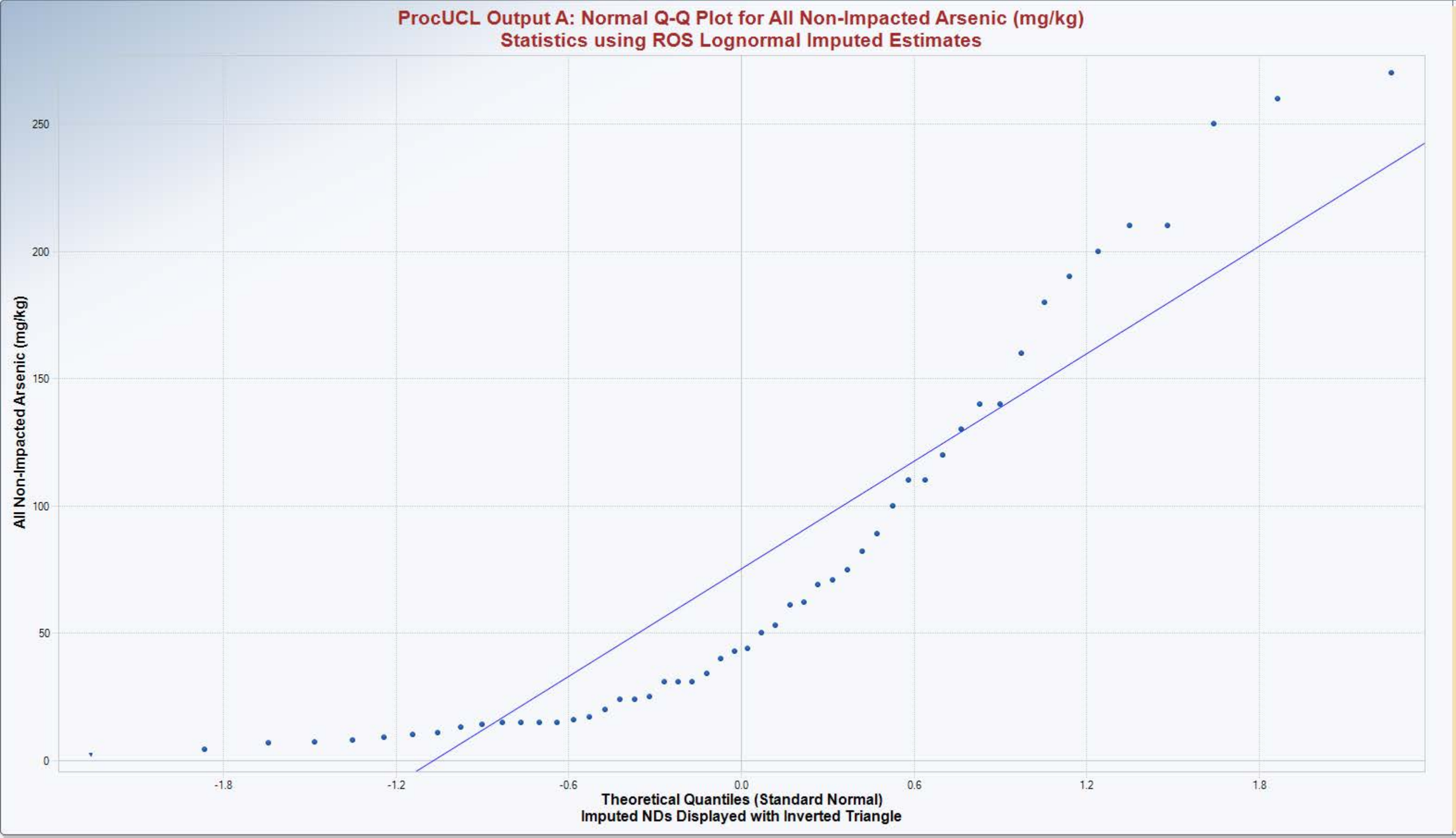
Reference: **Beaver Dam – Methodology of Statistic Calculations for Investigating Background Level of Arsenic in Soil**

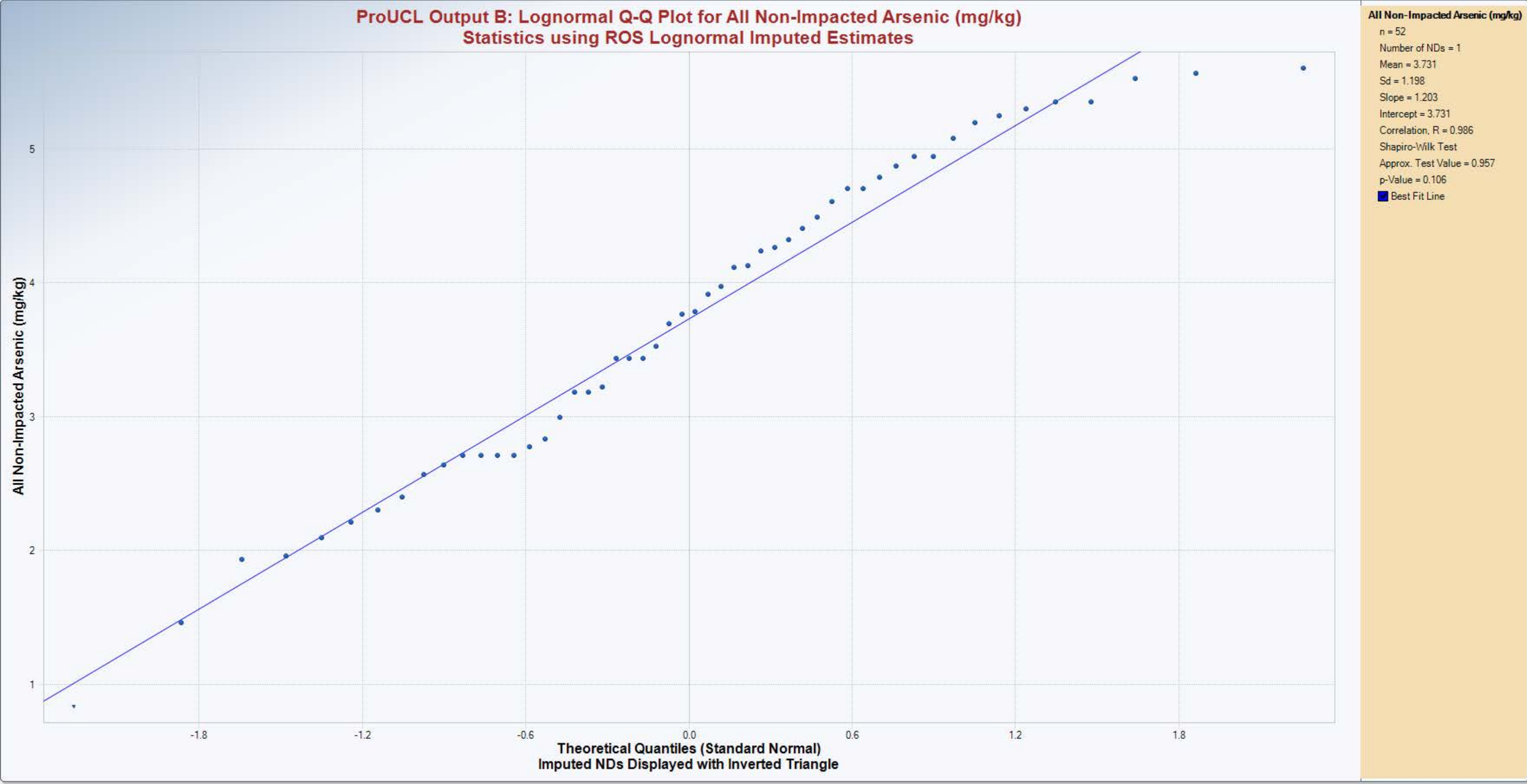
REFERENCES

British Columbia Ministry of Environment & Climate Change Strategy. 2001. "Contaminated Sites Statistical Applications Guidance Documents No. 12-4: Distribution Models."
Nova Scotia Environment. 2013a. "Contaminated Sites Regulations."
Nova Scotia Environment. 2013b. "Table 1A and 1B - Tier 1 Environmental Quality Standards for Soil."
Stantec. 2019. "Draft - Limited Phase II Environmental Site Assessment – Beaver Dam Property."
Stantec. 2020. "Draft - Extended Phase II Environmental Site Assessment - Beaver Dam Property."
Stantec. 2021. "Extended Phase II Environmental Site Assessment, Fifteen Mile Stream, Route 374, Trafalgar, NS."
US EPA Office of Research and Development. 2015. "ProUCL Version 5.1 User Guide." October. https://www.epa.gov/sites/production/files/2016-05/documents/proucl_5.1_user-guide.pdf.
—. 2016. "ProUCL: Statistical Support Software for Site Investigation and Evaluation." *ProUCL Fact Sheet.* May. https://www.epa.gov/sites/production/files/2015-03/documents/proucl_one_page_fact_sheet.final_.pdf.

	A	B	C	D	E	F	G
1	**ProUCL Input A: Data - Metals in Soil**						
2							
3	**Sample IDs**	**All Non-Impacted Arsenic (mg/kg)**	**d_All Non-Impacted Arsenic (mg/kg)**				
4	TP20-03	2	0				
5	TP20-52	4.3	1				
6	TP19-17	6.9	1				
7	TP20-02	7.1	1				
8	TP20-08	8.1	1				
9	TP20-64	9.1	1				
10	TP20-21	10	1				
11	TP20-01	11	1				
12	TP19-18	13	1				
13	TP20-104	14	1				
14	TP20-04	15	1				
15	TP20-46	15	1				
16	TP19-16	15	1				
17	TP20-14	15	1				
18	TP20-22B	16	1				
19	TP20-58	17	1				
20	TP20-43	20	1				
21	TP20-18	24	1				
22	TP20-22A	24	1				
23	TP19-10	25	1				
24	TP20-34	31	1				
25	TP20-61	31	1				
26	TP20-62	31	1				
27	TP19-23	34	1				
28	TP20-13	40	1				
29	TP19-22	43	1				
30	TP20-12	44	1				
31	TP20-29 (2)	50	1				
32	TP20-09	53	1				
33	TP20-23	61	1				
34	TP20-07	62	1				
35	TP19-19	69	1				
36	TP20-10	71	1				
37	TP19-24	75	1				
38	TP19-21	82	1				
39	TP19-09	89	1				
40	TP20-05	100	1				
41	TP20-33	110	1				
42	TP20-35	110	1				
43	TP20-51	120	1				
44	TP19-11	130	1				
45	TP20-31	140	1				
46	TP19-25	140	1				
47	TP19-04	160	1				
48	TP20-47	180	1				
49	TP19-20	190	1				
50	TP20-50	200	1				
51	TP20-55	210	1				

	A	B	C	D	E	F	G
52	TP19-02	210	1				
53	TP20-49	250	1				
54	TP20-53	260	1				
55	TP20-48	270	1				
56							
57	**Notes:**						
58	The third column indicates to ProcUCL whether there is a non-detect value in the second column.						


ProcUCL Output A: Normal Q-Q Plot for All Non-Impacted Arsenic (mg/kg)
Statistics using ROS Lognormal Imputed Estimates
All Non-Impacted Arsenic (mg/kg)
250
200
150
100
50
0
-1.8
-1.2
-0.6
0.0
0.6
1.2
1.8
Theoretical Quantiles (Standard Normal)
Imputed NDs Displayed with Inverted Triangle
All Non-Impacted Arsenic (mg/kg)
n = 52
Number of NDs = 1
Mean = 75.34
Sd = 75.62
Slope = 70.56
Intercept = 75.34
Correlation, R = 0.916
Shapiro-Wilk Test
Approx. Test Value = 0.823
p-Value = 0.000
Best Fit Line


ProUCL Output B: Lognormal Q-Q Plot for All Non-Impacted Arsenic (mg/kg)
Statistics using ROS Lognormal Imputed Estimates
All Non-Impacted Arsenic (mg/kg)
n = 52
Number of NDs = 1
Mean = 3.731
Sd = 1.198
Slope = 1.203
Intercept = 3.731
Correlation, R = 0.986
Shapiro-Wilk Test
Approx. Test Value = 0.957
p-Value = 0.106
Best Fit Line
All Non-Impacted Arsenic (mg/kg)
5
4
3
2
1
-1.8
-1.2
-0.6
0.0
0.6
1.2
1.8
Theoretical Quantiles (Standard Normal)
Imputed NDs Displayed with Inverted Triangle

ProUCL Output C: Results of Outlier Testing (Arsenic)

Outlier Tests for Selected Variables replacing nondetects with 1/2 the Detection Limit

User Selected Options	
Date/Time of Computation	ProUCL 5.111/5/2020 2:58:55 PM
From File	WorkSheet.xls
Full Precision	OFF

Rosner's Outlier Test for 1 Outliers in All Non-Impacted Arsenic (mg/kg)

Total N	**52**
Number NDs	**1**
Number Detects	**52**
Mean with NDs=DL/2	**75.32**
SD with NDs=DL/2	**75.65**
Number of data	**52**
Number of suspected outliers	**1**
NDs replaced with half value.	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	75.32	74.92	270	52	2.599	3.144	3.496

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**ProUCL Output D: Statistics**												
2													
3				**General Statistics on Uncensored Data**									
4			Date/Time of Computation	ProUCL 5.111/5/2020 3:21:48 PM									
5			**User Selected Options**										
6			From File	WorkSheet.xls									
7			Full Precision	OFF									
8													
9	**From File: WorkSheet.xls**												
10													
11	**General Statistics for Censored Datasets (with NDs) using Kaplan Meier Method**												
12													
13	**Variable**		**NumObs**	**# Missing**	**Num Ds**	**NumNDs**	**% NDs**	**Min ND**	**Max ND**	**KM Mean**	**KM Var**	**KM SD**	**KM CV**
14	ll Non-Impacted Arsenic (mg/kg)		52	0	51	1	1.92%	2	2	75.34	5610	74.9	0.994
15													
16	**General Statistics for Raw Dataset using Detected Data Only**												
17													
18	**Variable**		**NumObs**	**# Missing**	**Minimum**	**Maximum**	**Mean**	**Median**	**Var**	**SD**	**MAD/0.675**	**Skewness**	**CV**
19	ll Non-Impacted Arsenic (mg/kg)		51	0	4.3	270	76.77	44	5725	75.66	45.96	1.144	0.986
20													
21	**Percentiles using all Detects (Ds) and Non-Detects (NDs)**												
22													
23	**Variable**		**NumObs**	**# Missing**	**10%ile**	**20%ile**	**25%ile(Q1)**	**50%ile(Q2)**	**75%ile(Q3)**	**80%ile**	**90%ile**	**95%ile**	**99%ile**
24	ll Non-Impacted Arsenic (mg/kg)		52	0	9.19	15	15	43.5	112.5	138	199	228	264.9

APPENDIX G

Previous Reports, Maps, and Referenced Map Drawings

Final – Phase I Environmental Site Assessment (Stantec 2019a)
Limited Phase II Environmental Site Assessment (Stantec 2019b)
Drawing No. G - 1 Bedrock Geology – Beaver Dam Project
Drawing No. G - 2 Surficial Geology – Beaver Dam Project
Geological Map of the Province of Nova Scotia (Keppie 2000)
Surficial Geology of the Province of Nova Scotia (Stea 1992)

FINAL -
Phase I Environmental Site Assessment

Beaver Dam Property
181 Beaver Dam Mines Road, Marinette, NS

Prepared for:
Atlantic Gold

Prepared by:
Stantec Consulting Ltd.
40 Highfield Park Drive
Dartmouth, NS B3A 0A3

Job No.: 121619250.2500.955

August 06, 2019

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Executive Summary

Executive Summary

Site Description and Current Operations

Stantec Consulting Ltd. (Stantec) conducted a Phase I Environmental Site Assessment (Phase I ESA) of the proposed mining operations known as the Atlantic Gold Beaver Dam Project located in Marinette, Nova Scotia, herein referred to as the "Site". The Phase I ESA was conducted as part of project feasibility due diligence underway for the potential re-development of the gold mine at this location. The purpose of the Phase I ESA was to assess if evidence of potential or actual environmental contamination exists in connection with the Site, as a result of current or past activities on the Site or neighbouring properties.

The site area is currently woodland/overgrown, and is within the area to be occupied by the future extent of the Beaver Dam open pit mine and associated infrastructure. At the time of the site visit there was no activity on the site other than various consultants and contractors conducting various due diligence and preparation for a drill program to further delineate the resources.

Records Review

Based on the historical information gathered during the Phase I ESA, central portions of the Site were developed in 1860s when gold was discovered in Nova Scotia. Between 1868 and 1930s there were various surface excavations, mine shafts of various depths, and numerous stamp mills or crushers utilized for the extraction and processing of gold from the quartzite ore. Based on a previous feasibility study from the 1980s, much of the early work at this location was undocumented. In 1899 there was sufficient mining in the area to warrant the naming of the area as the "Beaver Dam Gold District" on a plan prepared by E.R. Faribault. Based on a plan drawn in 1902 and revised in 1928 by Mr. Faribault there were three areas of mining. One was located to the west of Crusher Lake at Forge Hill which consisted of a stamp mill and cabin and various mine openings. The next was located near the northeast end of Crusher Lake where there was another stamp mill, cabin and other buildings. The largest operation was located further east which included the Austen Shaft and other surface operations including another stamp mill. Based on the Seabright feasibility study, between 1911 and 1983 roughly every 10 years there was limited mining and exploration of resources being conducted mainly in the area of Austen Shaft. This included dewatering existing shafts for further excavation as well as surface trenching. The records are unclear but based on a 2015 report there was approximately 3,345 tonnes of ore crushed and processed on-site prior to the Seabright operations.

In 1977 M.E.X Exploration Ltd. acquired the exploration rights and completed exploration drilling, surface trenching and collected a bulk sample of several hundred tonnes approximately 300 metres northeast of Crusher Lake and 200 metres west of the current settling pond. This was later identified as the M.E.X. pit.

Seabright Resources Inc. continued the exploration of the Beaver Dam site in the area of Austen Shaft in the mid-1980s which culminated in the development of a portal and incline which joined with the existing workings in 1986. Development on the surface included the construction of a maintenance garage, self-generated power, installation of trailers for offices and storage, improvement of the existing woods road, and the construction of a dam to retain water in the settling pond with a discharge to Cameron Flowage (a portion of the Killag River). Between 1986 and 1989 this underground mine was fully operational and the Report of Work and Expenditures indicated the mine operations included underground fuel storage and generators. This operation lasted until 1989 when the portal and infrastructure were removed and the area leveled and reclaimed by 1992. It appears from the aerial photographs that the waste rock was used to reclaim the area. Based on the Report of Work and Expenditures from 1986 to 1989 the mine advanced a total of 3,787 meters and 135,000 tonnes of rock was removed from the mine; of this, 41,000 tonnes of ore was milled at Gays River.

The historical practice of gold mining in the 1800s/early 1900s used crushers to render the ore into sand size particles. The sand size particles were then washed with water and mercury to recover the fine gold particles. The resulting tailings mixture was allowed to flow from the stamp mills into adjoining low lying areas in an uncontrolled manner with alternating amounts of water to push the tailings further from the stamp mill as needed. The base rock from which the gold was extracted was sandstone and slate of the Meguma Group Goldenville Formation; this formation is also known to be high in natural concentrations of arsenopyrite (FeAsS) which is associated with gold deposits in Nova Scotia. The tailings areas may contain both mercury and arsenic. Mapping provided by the Nova Scotia Department of Natural Resources illustrate numerous excavations, shafts and mining operations on the Site and surrounding areas. The Department also provided electronic mapping for three areas of suspected tailings deposits which align with the historical locations of operations in the 1920s.

Executive Summary (continued)

Records Review (continued)

A report prepared by the Department of Natural Resources titled Review of the Environmental Impacts of Historic Gold Mine Tailings in Nova Scotia from October 2015 indicated the following general information about tailings impacts from historical gold mining areas. There are an estimated 3 million tonnes of tailings from historical gold mines in Nova Scotia. In some areas the tailings have been reported to be several metres thick and have migrated in rivers and streams for more than 2 km. Based on this document there were no available test results for arsenic or mercury concentrations in the tailings at Beaver Dam. This report did indicate that between 1889 and 1989, 44,345 tonnes of tailings mass was produced from Beaver Dam, however it was noted that material generated in the 1980s (41,000 tonnes) was milled at Gays River.

The presence of the tailings and associated waste rock represents a potential environmental concern to the Site. The presence of the maintenance shop, reported on-site power generation, and underground fuel storage from the Seabright operation in the 1980s also represents a potential environmental concern to the Site.

Site Visit/Interviews

During the site visit completed between July 10-12, 2019, there was very little evidence of the historical mining operations at this location. There were no obvious foundations of stamp mills or areas of sandy tailings at surface. To the west in the area identified as Forge Hill some suspicious graded sand (suspected tailings), was discovered covered by a layer of moss in several locations near the reported location of historical mine operations. The wetlands and dense brush in this area prevented a more thorough investigation.

At the second area located north of Crusher Lake, the ruins of an old cabin were discovered. This is in the area of a reported stamp mill and office in the 1920s. Beside this ruin there is a holding pond and what appears to be a rock lined channel from Crusher Lake which now feeds a small brook which leads to Mud Pond to the north. There is an elevation change from Crusher Lake down to the brook of several metres; at the base of the slope there is a moss covered wetland area on either side of the brook. Under the moss layer there was graded sand material which was identified as suspected tailings. Following the remains of a woods road to the west, a similar rock cut channel was encountered and additional suspected tailings identified under a moss covering as well as other suspected waste rock piles. The observations made on-site suggest that various crushing operations may have operated along the northern side of Crusher Lake.

On the northeast corner of Crusher Lake there was a cluster of informal cottages which was identified as a squatters camp. There were signs posted for the owner of these buildings to remove them from Northern Timber property. The camp consisted of four buildings that appear to be in a state of disrepair. The four buildings were a "bunk house" which was unlocked and in a state of partial ruin, a "cabin" which was in better condition and locked, an unlocked shed and an outhouse. Potentially associated with this camp was a hunting blind located approximately 100 meters to the northwest.

The M.E.X. pit area was partially overgrown with several of the larger deeper excavations now filled with water. There was scattered metal debris and a plastic drum in this area.

Where the Beaver Dam Mines Road ends there is a fork in the road; to the west is the access road to Crusher Lake and to the north the road continues ten meters to another fork which leads to the east where the road follows the northern side of the settling pond to the earthen dam. The northern path leads to a drumlin to the north used for timber harvesting as well as several cleared paths to previous drill locations. At the first fork in the road there is a clearing approximately 20 metres by 20 metres. This appears to be an area of the historical mining operations in the early 1900s known as the Austen Shaft and in the 1980s the Seabright operations. With the exception of a suspected 1,000L plastic tote and some concrete sections near the access road there were no obvious signs of the historical mining in this area. There was a waste rock mound to the west between the road and the M.E.X. pit area and another mound to the south of the road that were mainly bare which aligns with the areas reclaimed by Seabright by 1992. Other areas of suspected waste rock around the settling pond appeared to be tree covered. At the eastern end of the settling pond there is an earthen dam with a washed out spillway. To the north of the settling pond there is a wetland and suspicious grey sand was noted during the site visit as potential tailings. Potential tailings in the settling pond from historical mining operations could not be assessed.

Executive Summary (continued)

Site Visit/Interviews (continued)

During the site visit, Stantec staff discussed with the McCallum representative conducting wetland delineations if they had noted obvious signs of tailings (sand like material in streams, around wetlands, with no vegetation). They indicated there were no obvious tailings.

Conclusions

The Phase I ESA has revealed evidence of potential environmental contamination associated with the Site.

Based on the information gathered there are suspected tailings and waste rock both within the area of the proposed open pit development as well the area of the adjacent pit operations, which are potentially impacted with arsenic, mercury and have potential acid generating potential. Additionally, the mine operation in the 1980s included power generation, maintenance work and underground fuel storage.

The statements made in this Executive Summary are subject to the same limitations included in the Closure (Section 7.0) and are to be read in conjunction with the remainder of this report.

Phase I Environmental Site Assessment

1.0 General Information

Client Information:
Atlantic Gold
Jame Millard, M.Sc., P.Geo
6749 Moose River Road
Moose River, NS B0N 1X0

Project Information:
Beaver Dam Gold Mine
121619250.2500.955

Site Information:
Beaver Dam Property
181 Beaver Dam Mines Road
Marinette, NS

Consultant Information:
Stantec Consulting Ltd.
40 Highfield Park Drive
Dartmouth, NS B3A 0A3

Phone: 9024687777 **Fax:** 902-468-9009
E-mail Address: patrick.turner@stantec.com
Site Visit Date: 07/10/2019
Report Date: 08/06/2019
Site Assessor: Patrick Turner, B.Sc, P.Eng.
Report Preparer: Patrick Turner, B.Sc, P.Eng.
Senior Reviewer: Don Carey, M.Sc., P.Eng.

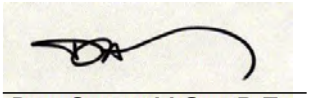
Site Assessor:

Patrick Turner, B.Sc, P.Eng.
Senior Environmental Engineer

Report Preparer:

Patrick Turner, B.Sc, P.Eng.
Senior Environmental Engineer

Senior Reviewer:



Don Carey, M.Sc., P.Eng.
Senior Technical Reviewer

The environmental site assessment and preparation of this report were completed in general accordance with the objectives, requirements or standards of the CSA Phase I Environmental Site Assessment Standard Z768-01 (R2016).

2.0 Introduction

2.1 Objectives

Stantec Consulting Ltd. (Stantec) conducted a Phase I Environmental Site Assessment (Phase I ESA) of the area located at the Atlantic Gold Beaver Dam Project property located in Marinette, Nova Scotia, herein referred to as the "Site". The Phase I ESA was conducted as part of project due diligence underway for the potential re-development of the gold mine at this location. The purpose of the Phase I ESA was to assess if evidence of potential or actual environmental contamination exists in connection with the Site, as a result of current or past activities on the Site or neighbouring properties.

A site plan is included in Appendix A and selected photographs of the Site are included in Appendix B.

2.2 Scope of Work

The Phase I ESA carried out by Stantec on this property was conducted in general accordance with Stantec's Proposal Number 734713 dated June 12, 2019 and the Canadian Standards Association's (CSA) Phase I Environmental Site Assessment Standard Z768-01 (R2016) and consisted of the following:

- records review including, but not limited to, publicly available city directories, aerial photographs, fire insurance plans, geological and topographic maps
- provincial government regulatory search
- review of available environmental databases and records
- review of previous environmental reports and existing title searches, if made available
- interviews with persons having knowledge of the Site
- a site visit
- evaluation of information and preparation of the report provided herein

A Phase I ESA does not include sampling or testing of air, soil, groundwater, surface water or building materials. For this Phase I ESA, no enhancements to the CSA standard were made.

This assessment did not include a review or audit of operational environmental compliance issues, or of any environmental management systems, which may exist for the Site.

The assessment of the Site for the potential presence of hazardous building materials was based on the age of the building(s) and components, and a non-intrusive visual review of the Site. No sampling of materials was conducted. A Phase I ESA does not constitute a Hazardous Materials Survey or Designated Substances Survey.

The assessment of the Site for microbial contamination and moisture damage was made during the walk through of the building(s). This assessment was visual only and not every area was assessed. No sampling or intrusive investigation was conducted.

The professional qualifications of the project team are provided in Appendix C.

The site visit was conducted by Patrick Turner, P.Eng., Eric Arseneau, MES and Mike Parker of Stantec, between July 10 and 12, 2019. The Site and readily visible and publicly accessible portions of adjoining and neighbouring properties were observed for the presence of potential sources of environmental contamination. Stantec was unaccompanied during the site visit.

Interviews were carried out with wetland biologists with McCallum both on-site and prior to visiting the site who were delineating the wetlands within the project area. James Millard of Atlantic Gold provided some information related to operations in the 1970s and 1980s and the lime dosing station to the east. Pertinent information gathered from the interviews is presented within the appropriate sections of this report.

Due to the size of the property (approximately 385 Ha), the assessment consisted of driving portions of the available woods roads, walking overgrown woods roads, with limited bushwhacking to reach areas of proposed future development, and through review of historical aerial photographs, LIDAR imagery, and topographical and geologic maps of the area. It should be noted that significant portions of the Site are covered by thick vegetation which prevented a thorough assessment of the ground surface in those areas of the Site during the site visit.

2.0 Introduction (continued)

2.3 Regulatory Framework

In Nova Scotia, the Contaminated Site Regulations and associated Ministerial Protocols (effective on and after July 6, 2013), prescribe the regulatory process and time frames to notify the Department, assess the site, remediate the impacts and obtain "Closure" for a contaminated site. The first step in the full property remediation process is completing a Phase I ESA as prescribed in the applicable Ministerial Protocol. A Phase I ESA may identify potential environmental concerns on the property which may lead to additional assessment and remediation.

During a Phase I ESA samples are not collected, however, if there are previous soil or groundwater sample results available, the results are compared to applicable federal and provincial regulations and guidelines.

A Phase I ESA involves a review of any site buildings for the potential presence of hazardous materials related to building components and materials. Specific federal or provincial regulations, guidelines or codes of practice exist for these individual hazardous materials. Where required, this documentation was utilized to determine appropriate conclusions and formulate appropriate recommendations.

3.0 Records Review

3.1 Information Sources

The applicable search distance for the records review included the Site, properties immediately adjoining the Site and other neighbouring properties where activities considered to be potential sources of environmental contamination were apparent. Information sources obtained and reviewed as part of the records review are listed below.

SOURCE	INFORMATION/CONTACT
Aerial Photographs	1931, 1947, 1954, 1964 - National Airphoto Library 1982, 1992, 2003, 2006 and 2017 - Stantec Aerial Photography collection June 2004, September 2011 and June 2012 - GoogleEarth Pro Imagery accessed July 2019
Fire Insurance Plans	None available
City Directories	Nova available
Previous Environmental Reports	None provided
Company Records	NI 43101 - Technical Report of the Beaver Dam Gold Project, Halifax County, Nova Scotia. Prepared for Atlantic Gold Corporation by FSSI Consultants (Aust) Pty. Ltd., dated March 15, 2015. Beaver Dam Mine Project Description, Beaver Dam Mines Road, Marinette, Nova Scotia. Report prepared by GHD for Atlantic Gold Corporation, dated October 5, 2015. Project No. 088664.
Geological and Geotechnical Reports	Surficial Geology Map of the Province of Nova Scotia, Nova Scotia Department of Natural Resources, Map 92-3, 1992. Geological Map of the Province of Nova Scotia, Nova Scotia Department of Natural Resources, Map ME2000-1, 2000. Map Showing Potential Radon in Indoor Air in Nova Scotia, Province of Nova Scotia, Department of Natural Resources. Accessed interactive map in July 2019. Department of Natural Resources Report titled Review of the Environmental Impacts of Historic Gold Mine Tailings in Nova Scotia dated October 2015
Regulatory Infractions	None reported
Reportable Spill Occurrences	None reported
Contaminated Sites	None reported

3.0 Records Review (continued)

3.1 Information Sources (continued)

SOURCE	INFORMATION/CONTACT
Hazardous Waste Generator Registration	None reported
PCB Storage Sites	None reported
Landfill Records	None reported
Underground & Aboveground Storage Tanks	None reported
Other Available Information	Beaver Dam Project Preliminary Feasibility Study, report prepared by Seabright Resources Inc. dated February 21, 1986. Beaver Dam Property Development License 0078 report of Work and Expenditures for the period May 1, 1986 to April 30, 1989. Report prepared by Westminer Canada Limited, Seabright Operations. Department of Natural Resources File No. AR 89-213. Report Nova Scotia Department of Mines and Energy on Environmental Assessment of Beaver Dam Exploration, Beaver Dam, Nova Scotia. Prepared for Seabright Resources Inc. by Jacques Whitford (now Stantec), report dated June 27, 1986, File No. M1285. Department of Natural Resources File No. PR 86-005. Diamond Drilling Work carried out by Seabright Resources Inc. on Exploration License 9085, Beaver Dam, Halifax County Report No. BD86-1. Dated January 1986. Department of Natural Resources File No. AR 86-025. Report on the Beaver Dam Property Nova Scotia. Report prepared by MPH Consulting Limited for Seabright Resources Inc. dated February 25, 1986. Department of Natural Resources File No. AR 86-064. Beaver Dam East report of 2005 Exploration Conducted at Beaver Dam East, Halifax County, Nova Scotia by Henry Schenkles. Report dated February 6, 2006. Department of Natural Resources File No. AR 2006-032. Geological Survey of Canada Memoir 385, Gold Fields of Nova Scotia (first published 1929 as Memoir 156) a compilation by W. Malcolm based on the work of E.R. Faribault, reprinted 1976. Appendix N.1 Archaeological Assessment Beaver Dam Mine Site - part of the Beaver Dam Mine Project - Revised Environmental Impact Statement, Marinette, Nova Scotia. Prepared by Cultural Resources Management Group Limited for Conestoga-Rovers & Associates. Dated March 2015, CRM Project No. 2014-0015-01. and January 2019, CRM Project No. 2018-0015-02.

3.0 Records Review (continued)

3.1 Information Sources (continued)

SOURCE	INFORMATION/CONTACT
Other Available Information	
	M.E.X. Explorations Limited Progress Report on the Beaver Dam Gold Mines Property, dated February 7, 1978. Department of Natural Resources File No. AR 433165.
Water Well Records	Based on the Nova Scotia Groundwater Atlas accessed July 2019, there are no drinking water wells on the Site. The mapping does illustrate numerous drill locations from the various exploration drilling programs that have been conducted on the Site.
Historical Mapping	Geological Survey of Canada, Sheet 49 - Upper Musquodoboit Sheet, Dated 1899. Surveyed by E.R. Faribault. Scale 1:64,360.
	Beaver Dam Gold District, Scale 1 inch = 200 feet, Surveyed in 1902 and revised 1928 by E.R. Faribault.
	Department of Mines and Technical Services Sheet No. 11E/2 east half edition 2, Upper Musquodoboit, scale 1:50,000, published 1954 based on aerial photography taken 1948.
Topographic Mapping	Service Nova Scotia and Municipal Relations Topographic Map Sheet West Lake, Sheet No. 10 450500 62700, scale 1:10,000, based on aerial photography taken May 2006.

3.2 Previous Reports

Stantec obtained copies of various reports from the 1970s to the mid 2010s for the Site. These reports were not related to phased environmental assessment of the area. There were "environmental assessments" related to the proposed mine development along with various technical reports related to the mining and exploration activities as well as archaeological reports. Based on our review of these reports there was no specific information related to assessment, management or remediation of historical gold mine tailings at the Site. Information gathered from these reports about the use and development of the Site through the years is presented in Section 4.3 Historical Land Use.

A report prepared by the Department of Natural Resources titled Review of the Environmental Impacts of Historic Gold Mine Tailings in Nova Scotia from October 2015 indicated the following general information about tailings impacts from historical gold mining areas. There are an estimated 3 million tonnes of tailings from historical gold mines in Nova Scotia. In some areas the tailings have been reported to be several metres thick and have migrated in rivers and streams for more than 2 km. However, based on this document there were no available test results for arsenic or mercury concentrations in the tailings at Beaver Dam. This report did indicate that between 1889 and 1989, 44,345 tonnes of tailings mass was produced from Beaver Dam, however material generated in the 1980s (41,000 tonnes) was milled at Gays River, leaving 3,345 tonnes of tailings on-site.

The presence of the historical mining operations represent a potential environmental concern to the Site.

3.0 Records Review (continued)

3.3 Regulatory Information

We have received Nova Scotia Environment's response to our inquiry for the subject site and adjoining properties. It must be noted that our request to Nova Scotia Environment was limited due to the minimal number of civic addresses on the property records, and absence of dwellings with civic numbers (NSE files are based on civic addresses). We specifically did not request information about the development of the current proposed gold mine. Based on the information, NSE had no specific records related to the former mining operations on the Site. There were two water resource files that were subject to a Freedom of Information Protection of Privacy (FOIPOP) request. In discussion with Atlantic Gold it was realized that these are likely related to a lime station located to the east of the Site along the Killag River and not historical mine operations. These records related to the lime station were not requested. A copy of the NSE reply is attached in Appendix D.

3.4 Physical Setting

3.4.1 Surficial Geology

Based on an available surficial geology map, the native surficial soils of the Site consist of glacial till. The characteristic permeability of these soils is moderate. A site-specific determination would be required in order to obtain detailed soil profile and permeability information. Previous subsurface investigations conducted on the Site indicate the subsurface soil profile at the Site to consist of glacial till, as well as historical tailings and waste rock in some areas between 2 and 3 metres thick. Bedrock was encountered between 2 and 3 metres below grade.

3.4.2 Surface Water Drainage

The surfaces of the Site consist of a combination of open wetland, rock piles and woodland. Stormwater is anticipated to drain by infiltration and/or overland flow. Water in the eastern portion of the Site is directed toward an artificial settling pond with the remains of a earthern dam which is maintaining the water level in the pond.

3.4.3 Topography and Regional Drainage

The site area is mainly rolling hills with woodland which have re-grown after historical gold mining and timber harvesting, which included construction of various dams along local water ways, surface mining, water washing, and excavation of numerous mine shafts/pits.

Based on an available topographic map and the observed site topography, regional undisturbed surface drainage (anticipated shallow groundwater flow direction) appears to be to the north toward Crusher Lake, then via an unnamed brook to Mud Pond with eventual outflow into Killag River and Cameron Flowage.

It should be noted that the direction of the shallow groundwater flow in limited areas can also be influenced by the presence of underground mine workings and is not necessarily a reflection of regional or local groundwater flow or a replica of the Site or area topography.

3.4.4 Bedrock Geology

Based on an available bedrock geology map, bedrock in the area of the Site consists of slate and quartzite of the Goldenville Formation. A suspected bedrock outcrop was noted along the mine access road in the area of the Seabright Camp location.

4.0 Site Description

4.1 Property Information

The Site is located in a rural forested area near Marinette, a region of Halifax Regional Municipality. The Site is located 7 km northeast of Route 224 along Beaver Dam Mine Road which is a gravel road located approximately 17 km north-northwest of Sheet Harbour, Nova Scotia.

The Site consists of portions of several different properties owned by Northern Timber Nova Scotia Corp; Property Identification Numbers (PID Nos.) include:

- PID 40200990, Grant 13245;
- PID 40201014, Grant 15833;
- PID 40201022, Grant 13818;
- PID 41202359, Grant not listed;
- PID 40201071, Grant not listed;
- PID 40201006, Grant 14028;
- PID 40201030, Grant 9805;
- PID 41202334, Grant not listed;
- PID 40469405, Grant not listed;
- PID 40201048, Grant not listed;
- PID 00541656. Grant 10271;
- PID 40200941, Grant not listed;
- PID 40201063, Grant (portion of) 13245;
- PID 41202342, Grant (portion of) 13245;

In addition to the Northern Timber Nova Scotia Corp. lands, part of the greater proposed development of the mine operation includes undeveloped land owned by the Province of Nova Scotia, including portions of the following PID:

- PID 40219925

The PIDs are not currently serviced being in a rural portion of the province. A summary of the property information is provided below.

Current Site Owner:	Northern Timber Nova Scotia Corp. and the Province of Nova Scotia
Legal Description:	Refer to PIDs above
Property Area:	Approximately 385 Ha
Utility Providers:	
Water:	None
Storm and Sanitary Sewers:	None
Electricity:	None
Natural Gas:	None

4.2 On-Site Buildings and Structures

During the site visit a squatters camp was identified near the northeastern end of Crusher Lake. The camp consisted of four buildings; a "bunk house", a "cabin", a shed and an outhouse. Approximately 100 meters northwest of the camp accessed by following the brook from Crusher Lake and over several small wooden bridges, there was a tree-stand hunting blind. The foundation of a suspected former log cabin was discovered near the brook leading from Crusher Lake.

4.3 Historical Land Use

Historical land use for the Site was determined through historical records listed in Section 3.0. A summary of the historical information is presented below.

4.0 Site Description (continued)

4.3 Historical Land Use (continued)

Period/Date:	Land Use:
Pre-1865	The area was undeveloped woodland
1866 to mid 1930s	The area was sporadically mined for gold as part of the Beaver Dam Gold District from 1868 to the mid 1930s. Based on the reviewed information sources, there were at least three stamp mills operating at various times on the Site. Mine operations reportedly started and stopped frequently during this period with various operations operating under similar names. The waste rock and tailings generated during this period represent a potential environmental concern due to the mineral content of the base rock and the mercury used to recover the gold. It was noted that development of this area was limited due to the remote nature of the Site. During this time period the flow from Crusher Lake was altered; originally there were two brooks flowing north toward Mud Pond. By 1928 the western outflow had been blocked and at the eastern brook there was an office, stamp mill and other buildings. To the west of Crusher Lake there was an area identified as Forge Hill. In this area there was another stamp mill, camps and mine shafts. To the east of Crusher Lake was the Austen Shaft (sometimes recorded as Austin). This appears to be the most significant shaft in the Beaver Dam area; it was over 75 feet deep and had various laterals. On the surface there was a stamp mill and other mine related buildings. The 1931 aerial photograph matches the site plan from 1928 showing a scattering of buildings at Forge Hill, the buildings at the northeastern end of Crusher Lake and a clearing with buildings and suspected tailings area in the area of the Austen Shaft. A road connects each of these operations running along the northern edge of Crusher Lake. The Killag River (Cameron Flowage) is dammed to the east of the Site just north of the current road crossing. These historical mining areas have been identified on the drawing in Appendix A. A copy of the 1928 survey of the Beaver Dam Gold District prepared by E.R. Faribault has been included in the Appendix D.
Late 1930s to early 1970s	There was limited information available for this period of time, especially in the 1940s and early 1950s. Based on the available aerial photograph from 1947 there is a disturbed area in the general vicinity of the Austen Shaft and apparent buildings at this location and there are also several buildings near the northeastern tip of Crusher Lake. The dam at the southeastern end of Cameron Flowage has been removed. Observed in the 1964 aerial photograph there are a series of trenches that have been excavated along the northern side of Crusher Lake and the area is generally disturbed suggesting exploration activities in the area. In 1964 a cabin is still present near the northeastern tip of Crusher Lake in the approximate location of the future ruins observed during the site visit. The buildings that were located near the Forge Hill and Austen Shaft no longer appear and the areas are cleared but partially overgrown.
Late 1970s	M.E.X. Exploration Limited completed exploration work at the Beaver Dam mine in late 1977. This included several hundred feet of trenching and surface assessments for gold. This work included the eventual excavation of a "several hundred ton sample" which was sent off-site to be milled. A plan included with their 1978 report highlights various other trenches excavated in the 1950s and older trenches and pits in the area of Austen Shaft. The M.E.X. area of exploration has been identified on the drawing in Appendix A and a copy of the exploration plan attached in Appendix D.

4.0 Site Description (continued)

4.3 Historical Land Use (continued)

Period/Date:	Land Use:
Early 1980s to early 1990s	There was a renewed interest in the potential gold resources based on the work completed by M.E.X and other drilling programs in the early 1980s. This culminated with Westminer Canada Limited, Seabright Operations opening a portal which connected to the Austen Shaft in 1986. This portal consisted of 715 meters of ramping covering 400 meters of strike depth and 105 meters of vertical depth. There were eight levels and by 1989 the mine advanced a total of 3,787 meters, from which 135,000 tonnes of rock was removed and 41,000 tonnes of this was milled at Gays River. To support this operation a garage building, diesel powered air compressor and power generator, underground fuel storage, various trailers and supporting buildings were constructed to the west of the Austen Shaft. By the early 1990s the area had been reclaimed and there was no evidence of the portal or other infrastructure remaining; with the exception of the dam located to the east of the settling pond. The location of the Seabright portal and area that was reclaimed is presented on the drawing in Appendix A and a copy of the Seabright Operations Plan is included in Appendix D.
Late 1990s to present	The site is overgrown woodland, based on the aerial photographs timber harvesting over the past 20 years has been conducted in various locations of the Site. There has been limited drilling on the Site as part of the on-going interest in gold production from the Beaver Dam Site. Based on the archaeological report for the Crusher Lake stamp mill area, in 2008 the squatters camp was first noted; the age of this camp is unknown. In 2014 when the report was updated the camp had expanded with additional buildings. The structure identified as a cabin in the 1960s was a ruin by 2008. The archaeological report did note other foundations and depressions that may have been the stamp mill located north of Crusher Lake. Due to the mining activity in the 1980s there was no evidence of the Austen Shaft or mining operations in this area. In 2018 a separate archaeological report focused on the Forge Hill area to the west. Based on the report there was at least one possible cabin ruins identified along with evidence of past mining activities in the area. As part of the information requested for this project the Department of Natural Resources was contacted about tailings mapping that they have produced. An electronic file was provided to Stantec; based on this information three possible areas of tailings had been identified in the Beaver Dam Gold District. These area corresponded to the approximate locations of the historical operations previously identified as Forge Hill, Crusher Lake and Austen Shaft. The Austen Shaft area is under the area flooded by the construction of the dam in the 1980s.

The presence of the historical mining operations, reported maintenance operations and fuel storage in the 1980s represent a potential environmental concern to the Site.

5.0 Site Visit Findings

5.1 Current Site Operations

The Site is currently an historical gold mining area with suspected tailings and waste rock observed in various areas of the Site. The majority of the the Site is wetlands, trees, shrubs and other vegetation. There are various gravel access roads on and around the site that have been developed to support the timber harvesting activities. During the site visit, a squatters camp was identified near the northeastern end of Crusher Lake. There are no currently active operations on the Site.

5.2 Waste Generation and Storage

5.2.1 Solid and Liquid Wastes

No hazardous waste generation or storage was identified to be conducted on the Site. There were suspected areas of waste rock from the historical mining activities noted during the site visit along with occasional surface metal debris and at least one 205 L plastic drum and an abandoned television set. In the area of the squatters camp there was scattered debris and what appeared to be an outhouse.

5.2.2 Drains, Sumps, Septic Systems and Oil Water Separators

No floor drains, sumps, septic systems, interceptors, or separators were identified on the Site. During the site visit, in the area of the Seabright Portal and associated maintenance buildings, the remains of a pair of buried 1,000 liter plastic totes were identified. The Seabirght operations reportedly included a septic system which was piped from the camp area by pipe to the east of the access road. A copy of the Seabright operations layout is included in Appendix D. At the squatters camp there was a building that appeared to be an outhouse.

5.2.3 Air Discharges and Odours

No sources of air emissions that are suspected to result in residual contamination to the property were identified on the Site. Further, no strong, pungent, or unusual odours were identified during the site visit.

5.3 Fuel and Chemical Storage

5.3.1 Underground Storage Tanks (USTs)

During the site visit no chemical or fuel storage USTs were identified on the Site. Further, no vent or fill pipes indicating the potential presence of an abandoned or decommissioned UST were observed. As noted previously in Section 4.3 there was reported underground fuel storage in the 1980s which represents a potential environmental concern.

5.3.2 Aboveground Storage Tanks (ASTs)

During the site visit, no chemical or fuel storage ASTs were identified on the Site.

5.3.3 Other Storage Containers

No chemical storage was observed on the Site.

5.4 Building Systems/Equipment

5.4.1 Heating and Cooling Systems

No heating or cooling systems are on the Site, as the Site is undeveloped.

5.0 Site Visit Findings (continued)

5.4 Building Systems/Equipment (continued)

5.4.2 Hydraulic Equipment

No in-ground hydraulic equipment is on the Site, as the Site is undeveloped.

5.5 Exterior Site Observations

5.5.1 Surface Features

During the site visit several hydrocarbon stained gravel areas were observed along the southern access road, likely from the timber harvesting activities in the area. The presence of these stained areas are not considered to be a concern to the Site.

It was noted that in various locations there are exposed suspected waste rock areas that do not support vegetation. During the site visit, several water filled pits and trenches were noted associated with historical mining and exploration activities.

McCallum Environmental Ltd., consultants working for Atlantic Gold as part of the mine development, have more fully delineated the various water bodies, wetlands and brooks on the Site. A copy of the current mine layout Figure 1 (updated June 27, 2019) has been included in Appendix D showing the proposed layout of the mine along with watershed boundaries, watercourses, and wetlands. However, Crusher Lake is within the boundary of Site along with various wetlands and brooks, and the Site is adjacent to Killag River and Cameron Flowage. To the east of the Beaver Dam Mines Road and the former Seabright operations there is a man-made settling pond with the remains of an earthen dam at the eastern end which controls the flow to Cameron Flowage located further to the east. It was noted along the base of the dam that there were areas of red stained seepage, the spillway associated with the dam is in disrepair, and there is evidence of over topping and erosion.

5.5.2 Fill Materials

There are areas of exposed suspected historical waste rock at the Site. Based on information obtained during the document review, the Seabright area of mining in the 1980s produced 135,000 tonnes of rock of which 41,000 tonnes was shipped off-site. The remaining rock appears to have been used to regrade the areas disturbed during the operations on-site. Smaller piles of suspected waste rock were noted in the Forge Hill area and along the northern side of Crusher Lake.

5.5.3 Wells

During the site visit various sets of monitoring wells were observed both on-site and on the adjoining properties. No reports for these wells were provided to Stantec. Adjacent to the wells were coils of plastic tubing suggesting that they have been sampled in the past. Since the wells were located in clusters they are likely drilled to different depths. Additionally, historical boreholes with plastic standpipes were also observed in various locations on the Site. There were records for a number of drilled exploration holes as part of the assessment of the area for development of a mine both on the Site and in the surrounding area in a grid pattern. It is unknown how the historical drilled holes, which extended several hundred feet in some cases, were backfilled.

5.6 Hazardous Building Materials

5.6.1 Asbestos-Containing Materials (ACMs)

The common use of friable (crumbles easily by hand pressure) asbestos-containing materials (ACMs) in construction generally ceased voluntarily in the mid 1970s but was only banned through legislation in the mid-late 1980s. Asbestos was used in thousands of building products and the common uses of friable ACMs included boiler and pipe insulation, and spray-on fireproofing. Asbestos was also used in many manufactured products such as floor tiles, ceiling tiles, transite cement products and various other construction materials. Some cement drain piping currently used in the construction of buildings still contains asbestos (non-friable). Vermiculite used as insulation may be contaminated with asbestos fibres.

5.0 Site Visit Findings (continued)

5.6 Hazardous Building Materials (continued)

5.6.1 Asbestos-Containing Materials (ACMs) (continued)

As the age of the squatters camp is unknown there is potentially asbestos-containing materials associated with these small buildings on the Site. During the site visit, the Cabin building was locked preventing an assessment of the interior. The Shed and Bunk House had limited finishes and no suspected friable asbestos materials in poor condition were noted.

5.6.2 Polychlorinated Biphenyls (PCBs)

From the 1930s to the 1970s, PCBs were widely used as coolants and lubricants for electrical equipment, including transformers and capacitors, and in a number of industrial materials, including sealing and caulking compounds, inks and paint additives. The use of PCBs was prohibited in heat transfer and electrical equipment installed after September 1, 1977, and in transformers and capacitors installed after July 1, 1980. Regulations now require that PCB containing equipment be taken out of service prior to regulated deadlines.

No oil-filled transformers or lamps ballasts were observed on the Site.

5.6.3 Lead-Based Materials

In 1976, the lead content in interior paint was limited to 0.5% by weight under the federal Hazardous Products Act. Lead based water supply pipes were used greater than 50 years ago. Between 1930 and 1986, most buildings used copper pipe with lead-solder joints. Other lead-based products include wall shielding (x-ray rooms).

As the age of the squatters camp is unknown there is a potential that painted surfaces contain lead paint. During the site visit there was a single exterior door on the Cabin that was in fair condition with flaking paint. Other painted surfaces were observed to be in good condition.

5.6.4 Urea Formaldehyde Foam Insulation (UFFI)

Urea Formaldehyde Foam Insulation (UFFI) was used as an insulation product for existing houses between the mid-1970s and its ban in Canada in 1980. It was not commonly used for commercial or industrial buildings.

The potential use of UFFI is unlikely given the observed construction of the squatters camp.

5.6.5 Ozone-Depleting Substances (ODSs)

Refrigeration and air conditioning equipment in place before 1998 may contain refrigerants containing Ozone-depleting Substances. Non-ODS refrigerants have been developed and are available to replace these materials in newer equipment.

No equipment containing ozone-depleting substances (ODSs) was identified on the Site.

5.7 Special Attention Items

5.7.1 Radon Gas

Radon is a radioactive gas associated with uranium rich black shale and/or granite bedrock. Radon emits alpha particles and produces several solid radioactive products called radon daughters. Harmful levels of radon and radon daughters can accumulate in confined air spaces, such as basements and crawl spaces.

Based on a the online map supplied by the Nova Scotia Department of Natural Resources, the Site is in an area of low radon potential.

5.0 Site Visit Findings (continued)

5.7 Special Attention Items (continued)

5.7.2 Microbial Contamination (Mould) and Indoor Air Quality

The growth of mould in indoor environments is typically due to a moisture problem related to building envelope or mechanical systems deficiencies or design, and can produce adverse health effects. There is no practical way to eliminate all mould and mould spores in the indoor environment. The way to control mould is to control moisture.

Based on the condition of the squatters camp there may be mould in the various buildings observed. As these buildings are to be demolished and are not occupied the potential presence of mould is not considered a potential concern.

5.7.3 Electromagnetic Frequencies (EMFs)

Electrical currents induce electromagnetic fields. No scientific data supports definitive answers to questions about the existence or non-existence of health risks related to electromagnetic fields.

No high-voltage transmission lines or electrical substations, which could generate significant electromagnetic fields, were identified on or adjacent to the Site.

5.7.4 Noise and Vibration

The effects of noise and vibration on human health vary according to the susceptibility of the individual exposed, the nature of the noise/vibration and whether exposure occurs in the working environment or in the home.

No major or persistent sources of noise and vibration were identified on the Site at the time of the site visit.

5.8 Neighbouring Property Information

The current activities on neighbouring properties observed at the time of the site visit and a summary of historical information gathered through the records review are presented below.

The areas outside the proposed mine operation area are woodland used for timber harvesting since the 1800s. To the east of the site there is a lime station that was installed by the local salmon association in 2016. The station adds lime to the Killag River by an automated system which monitors pH levels in the river.

There were no concerns noted with the presence of the lime station or adjoining timber harvesting activities.

5.9 Client-Specific Items

No specific client requests were made with respect to this Phase I ESA.

6.0 Conclusions

The Phase I ESA has revealed evidence of potential environmental contamination associated with the Site.

Based on the information gathered there are suspected tailings and waste rock both within the area of the proposed open pit development as well the area of the adjacent pit operations, which are potentially impacted with arsenic, mercury and have potential acid generating potential. Additionally, the mine operation in the 1980s included power generation, maintenance work and underground fuel storage.

7.0 Closure

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

This report is limited by the following:

- *Due to the size of the property (approximately 385 Ha), the wooded areas were assessed by driving portions of the available woods road and through review of historical aerial photographs, LIDAR imagery, and topographical and geologic maps of the area. It should be noted that portions of the Site are covered by thick vegetation which prevented a thorough assessment of the ground surface in those areas of the Site during the site visit.*

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Patrick Turner, P.Eng. and reviewed by Don Carey, M.Sc., P.Eng.

Appendix A

Site Plans

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4991000 4990000 4989000 4988000

N

Areas of suspected tailings and waste rock observed

Approximate locations of Purdy's Mill stamp mill and mine shaft ~1928

Mud Pond

MEX Pit from the 1970s - suspected waste rock

Abandoned hunting blind

General area of the Austin Shaft mining operations from the 1930s to 1957

Common Flowage (Killag River)

Sporadic areas of suspected waste rock

Area of suspected tailings and waste rock

Area of suspected tailings and waste rock along brook

Settling Pond from the 1930s

Dam Constructed in the 1930s

Apparent borrow pit/ quarry - electronic debris

Hunting camp buildings

Crescher Lake

Approximate location of Seabright office trailers, maintenance operations, underground fuel storage

Ruin of an old building - Stamp Mill and office buildings in 1928

Approximate location of the Seabright Resources Inc. extraction camp in the early 1980s

Killag River Lime Station

Approximate location of the Seabright portals 1980s

Stream Crossing access road

Approximate Area reclaimed by Seabright post 1989

Area of rock excavation - suspected quarry for road construction

Beaver Dam Mine Road

Access Road to Route 224

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Stantec

Legend

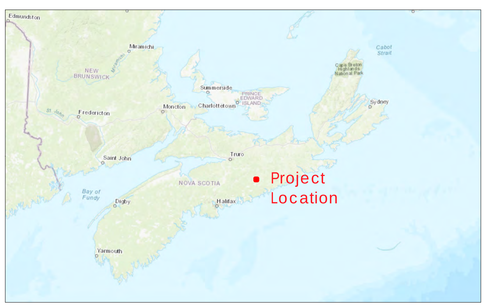
- Abandoned Mine Openings
- Snapping Turtle Nest (June 27, 2019)
- Camp
- Hunting Blind
- Portal
- Other
- Tracklog
- Beaver Dam Areas of Interest
- Project Area
- Beaver Dam Tailings (NSDNR)

0 260 520 metres

1:4,571 (At original document size of 34x44)

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Base features: McCallum and Atlantic Gold
3. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



Project Location 121619250

Prepared by MHS on 2019-07-31

Beave Dam, Nova Scotia

Client/Project

Beaver Dam

Appendix

A

Title

Phase 1 ESA Site Plan and Adjoining Properties

Plotted by: Mhollett on 2019-08-06 Last saved by: mhollett Path: C:\Users\mhollett\Documents\Projects\121619250\Maps\Phase 1 ESA\121619250_Phase 1 ESA_Site Plan.mxd

Appendix B

Photographs

View of earthen dam spillway looking west

Seepage from the base of the dam stained red looking east

View of settling pond looking west

Typical cluster of monitor wells installed in various locations on and around the Site

View of old 1,000 L totes buried in the former Seabright Operations area

Typical small water filled trench/opening found on-site

Abandoned hunting stand

Suspected mine tailings found north of Crusher Lake near brook under layer of organics

Ruins of a suspected cabin that dated from at least the 1960s

View of squatters camp looking southeast at the "Bunk house" with "Cabin" in the background

Interior of the "Bunk house"

Looking northeast at the squatters camp "Cabin" building

Looking east at the "Cabin", shed and outhouse buildings at the squatters camp

Water filled trench north of Crusher Lake

Brick debris along the access road toward the squatters camp

Old woods road that runs along the northern side of Crusher Lake

Typical gravel access road on the Site

Typical example of small surface staining less than 2 sq.m. in various locations on the Site

Looking northwest at the Killag River Lime dosing station located to the east of the Site

Looking northwest at the Killag River and bridge on the adjoining property to the east

Beaver Dam Mine Road looking north

Suspected waste rock on the south side of the access road to Crusher Lake

Appendix C

Assessor Qualifications

Patrick Turner, B.Sc., P.Eng.
Associate Environmental Services

Profile

Patrick Turner, B.Sc., P.Eng., has been with Stantec since 2000. Mr. Turner has conducted over 500 Phase I, II and III Environmental Site Assessments (ESAs) in Nova Scotia, New Brunswick, Newfoundland, Ontario and Quebec. These environmental assessments and remediation projects dealt with metal, hydrocarbon, polycyclic aromatic hydrocarbon, polychlorinated biphenyl and chlorinated solvent impacts in soil and/or groundwater. Properties assessed have ranged from single family dwellings to industrial oil refineries.

EDUCATION

B.Sc. – Dalhousie University – Math, 1997

Bachelor of Engineering (Civil) –
Technical University of Nova Scotia 1998

COMPENTENCY

Site Visit

Report Writer

Technical Report Review

PHASE I ENVIRONMENTAL SITE ASSESSMENT
ASSESSOR QUALIFICATIONS – Don Carey

Donald A. Carey, M.Sc., P.Eng.

Principal

Profile

Don Carey, M.Sc., P.Eng., is a Principal and Senior Hydrogeologist in the Dartmouth office of Stantec. He is also the Technical Leader for Site Investigation for Stantec's Canadian operations, and has been and continues to have responsibility for the development of standard operating procedures and quality for Phase I ESAs. Mr. Carey has more than 35 years' experience at Stantec in environmental site assessments, including senior technical review on more than 1,000 Phase I ESAs, for a wide variety of projects, from small residential properties, to large, complex industrial facilities.

Education M.Sc. – University of Waterloo – Hydrogeology, 1985
B.A.Sc. – University of Toronto – Geotechnical Enginering, 1977

Associations **Engineers of Nova Scotia**

Competencies Senior Review

Appendix D

Supporting Documentation

NOVA SCOTIA
Environment

Information Access and Privacy

PO Box 442
Halifax, Nova Scotia
B3J 2P8

ph: (902) 424-2549
fax: (902) 424-6925

June 26, 2019 Our file # ENV-2019-1597/1598

Email: patrick.turner@stantec.com

Patrick Turner
Stantec Consulting Ltd.
40 Highfield Park Drive
Dartmouth NS B3A 0A3

Dear Mr. Turner:

RE: 1178 Beaver Dam Mines Rd. (PID 40201048) and 181 Beaver Dam Mines Rd. (PID 40201030), Marinette

I refer to your enquiry of the Environmental Registry received June 14, 2019. We acknowledge receipt of payment for 2 properties.

Enclosed is the information that was located through the Environmental Registry with regards to 1178 Beaver Dam Mines Rd., Marinette.

No information was located through the Environmental Registry with regards to the remaining above referenced property.

Two water resource files (file# 95100-30-bed-2018-105032, 95100-30-bed-2017-107037) containing reports, correspondence, and applications and an Environmental Assessment project file (file#40100-30-274) pertaining to 1178 Beaver Dam Mines Rd., Marinette were located. These records, while not in the Environmental Registry, may be relevant to your request. Should you feel you require these records, they are subject to the Freedom of Information and Protection of Privacy (FOIPOP) Act. FOIPOP applications can be submitted by filling out the attached application form. Please quote the Environmental Registry number in your FOIPOP application.

Nova Scotia Environment makes no representations or warranties on the accuracy or completeness of the information provided.

Sincerely,

Tina Skeir
Information Access Office

NOVA SCOTIA

30 Damascus Road, Suite 115
Bedford NS
Canada B4A 0C1

902-424-7773 P
902-424-0597 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: NOVA SCOTIA SALMON ASSOCIATION

SITE PID: 40201048

APPROVAL NO: 2017-107037-00

EXPIRY DATE: September 30, 2017

Pursuant to Part V of the *Environment Act*, S.N.S. 1994-95, c.1 s.1 as amended from time to time, approval is granted to the Approval Holder subject to the Terms and Conditions attached to and forming part of this Approval, for the following activity:

Water Approval - Instream Structure

Administrator: Kevin G Garroway

Effective Date: August 18, 2017

The Minister's powers and responsibilities under the Act with respect to this Approval have been delegated to the Administrator named above. Therefore, any information or notifications required to be provided to the Minister under this Approval can be provided to the Administrator unless otherwise advised in writing.

TERMS AND CONDITIONS OF APPROVAL

Nova Scotia Environment

Approval Holder: NOVA SCOTIA SALMON ASSOCIATION

Project: West River Sheet Harbour - PID 40201048

Site:

PID	Civic #	Street Name	Street Type	Community	County
40201048				TEN MILE LAKE	HALIFAX COUNTY

Approval No: 2017-107037-00

File No: 95100-30-BED-2017-107037

Grid Reference: Easting - 523219, Northing - 4990058

Reference Documents

- Application submitted July 13, 2017 and attachments.

1. Definitions

a. Act means Environment Act, Chapter 1 of the Acts of 1994-95, and includes, unless the context otherwise requires, all regulations made pursuant to the Act.

b. Administrator means a person appointed by the Minister for the purpose of this Act, and includes an acting administrator.

c. Approval means an Approval issued pursuant to this Act with respect to an activity.

d. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Central Region, Bedford Office
30 Damascus Road, Suite 115
Bedford, Nova Scotia B4A 0C1

Phone: (902) 424-7773
Fax: (902) 424-0597

e. Erosion Protection means protective works constructed along the banks of water bodies to prevent erosion by surface runoff, stream flows and/or wave action.

f. Minister means the Minister of Environment and includes any person appointed as a designate of the Minister.

g. Nova Scotia Environment Watercourse Alteration Certification Training Manual means the training manual developed in accordance with the New Brunswick Watercourse Alteration Training Manual and Nova Scotia Watercourse Alteration Specifications current edition.

h. Recognized Individual means an individual who has successfully completed the Nova Scotia Environment Watercourse Alteration Certification Training Program.

i. Site means the location of the authorized work.

j. Watercourse means the bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all groundwater.

k. Wetland means lands commonly referred to as marshes, swamps, fens, bogs, and shallow water areas that are saturated with water long enough to promote wetland of aquatic processes which are indicated by poorly drained soil, vegetation and various kinds of activity which are adapted to a wet environment.

2. Scope

a. This Approval (the "Approval") relates to the Approval Holder(s) and their application and supporting documentation, as listed in the reference documents above, to construct the Instream Structure on West River Sheet Harbour situated at or near PID: 40201048.

b. Under authority of this Approval, the watercourse alterations specified herein shall be conducted between June 1st and September 30th (inclusive) of the same calendar year unless otherwise stated in the site specific terms and conditions.

3. General

a. The Approval Holder(s) shall construct the watercourse alterations in accordance with provisions of the most recent version of:

   i. Environment Act S.N.S. 1994-1995, c.1, s.1 as amended from time to time

   ii. Regulations pursuant to the above Act, as amended from time to time

b. Nothing in this Approval relieves the Approval Holder(s) of the responsibility for obtaining and paying for all licenses, permits, approvals or authorizations necessary for carrying out the work authorized to be performed by this Approval

which may be required by municipal by-laws or provincial or federal legislation. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.

c. No authority is granted by this Approval to enable the Approval Holder(s) to construct the watercourse alterations on lands which are not in the control or ownership of the Approval Holder(s). It is the responsibility of the Approval Holder(s) to ensure that such a contravention does not occur. The Approval shall provide, to the Department, proof of such control or ownership upon expiry of any relevant lease or agreement. Failure to retain said authorization may result in this Approval being cancelled or suspended.

d. If there is a discrepancy between the reference documents and the terms and conditions of this Approval, the terms and conditions of this Approval shall apply.

e. The Minister may modify, amend or add conditions to this Approval at any time pursuant to Section 58 of the Act.

f. This Approval is not transferable without the consent of the Minister.

   i. If the Minister determines that there has been non-compliance with any or all of the terms and conditions contained in this Approval, the Minister may cancel or suspend the Approval pursuant to subsections 58A(1) and 58A(2) of the Act, until such time as the Minister is satisfied that all terms and conditions have been met

   ii. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act and regulations

g. The Approval Holder(s) shall notify the Department prior to any proposed extensions or modifications of the activities outlined in the original Application for Approval.

h. Pursuant to Section 60 of the Act, the Approval Holder(s) shall submit to the Minister any new and relevant information respecting any adverse effect that actually results, or may potentially result, from any activity to which the Approval relates and that comes to the attention of the Approval Holder(s) after the issuance of the Approval.

i. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

j. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

k. Unless specified otherwise in this Approval, all samples required to be collected by this Approval shall be collected, preserved and analysed, by qualified

personnel, in accordance with recognized industry standards and procedures.

l. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analysed by a laboratory that meets the requirements of the Department's Policy on Acceptable Certification of Laboratories as amended from time to time.

m. The Approval Holder(s) shall submit any monitoring results or reports required by this Approval to the Department. Unless specified otherwise in this Approval, all monitoring results shall be submitted within 30 days following the month of monitoring.

n. The Approval Holder(s) shall ensure that this Approval, or a copy, is kept on site at all times and that personnel directly involved in the watercourse alterations are made fully aware of the terms and conditions which pertain to this Approval.

o. Failure to comply with the terms and conditions is an offence under the Environment Act.

p. The Approval Holder(s) shall notify the Department three business days prior to commencing construction of the Activity. The notification must include the Approval Number.

q. Within 14 days of completion of the work authorized under this Approval, the Approval Holder(s) is required to submit, to the Department, the enclosed form entitled Completion of the Approved Work.

4. Covenant Conditions

a. The Approval Holder(s) may alter the watercourse, or store water in any watercourse as authorized and, without limiting the generality of the foregoing, shall not alter or use the watercourse so as to:

   i. prejudice any riparian rights of any owner or of any person lawfully in possession of or holding any lands abutting the watercourse or any rights therein

   ii. suffer any loss, damage or nuisance to adjacent or abutting lands

b. The Approval Holder(s) shall not, at any time or for any purpose, place a pecuniary value on or claim any pecuniary value for the rights and privileges granted by this Approval, whether considered alone or in conjunction with any other property rights or privileges, over and above the amounts, if any, actually paid to the Minister by the Approval Holder(s) for said rights and privileges.

c. It is recognized and agreed that this Approval does not give sole or exclusive rights to any watercourse, and the Minister reserves the right to use the watercourse and water therein for any purpose and to allow others to use the

watercourse and water for any purpose, provided that such use or purpose does not constitute a substantial interference with the rights granted to the Approval Holder(s).

d. The Approval Holder(s) shall be responsible for obtaining and paying the costs of any and all approvals, services, easements, rights of way and authorizations of any kind necessary for the performance of any activities undertaken pursuant to this Approval. The Minister does not covenant that such approvals, services, easements, rights of way and authorizations of any kind will be issued by the Province of Nova Scotia, any other body or person.

e. The Approval Holder(s) shall maintain any bridge, culvert, dam, sluice, flume, conduit or other structure built or used in or on the watercourse in a state of good repair and in a clean and tidy condition to the satisfaction of the Minister. The Approval Holder(s) shall conform to any and all directions of the Minister concerning the rehabilitation of a watercourse or the construction, reconstruction, maintenance, removal, operation and location of any bridge, culvert, dam, sluice, flume, conduit or other structure built, used or maintained in and on the watercourse.

f. The Approval Holder(s) shall indemnify and save harmless the Minister against any loss, cost or damage occasioned by the Approval Holder(s)'s relocation of a watercourse or the construction of, repair, alteration or addition to any culvert, bridge, dam, sluice, flume, conduit or other structure. Such indemnity shall include, but not be restricted to, all losses, costs or damages occasioned by the improper or faulty relocation of a watercourse or the improper or faulty construction of repair, alteration or addition to any culvert, bridge, dam, sluice, flume, conduit or other structure in or on the watercourse, or by any trespass, negligence or willful act of the Approval Holder(s) or any employees, agents, contractors, or guests of the Approval Holder(s).

g. On the expiry or termination of this Approval or at the end of the useful life of the structure, as determined by the Minister, the Approval Holder(s) shall immediately cease operations and peaceably and quietly yield up and deliver possession of the watercourse in a condition satisfactory to the Minister, and the Minister shall incur no further expense, liability or cost in this regard.

h. The Approval Holder(s) shall remove any bridge, culvert, dam, sluice, flume, conduit or other structure or remnants thereof, and any equipment or personal property built, used or maintained in and on the watercourse at the end of the useful life of the structure, to the satisfaction of the Minister. In the event the Approval Holder(s) fails to remove such bridge, culvert, dam, sluice, flume, conduit or other structure or remnants thereof and any equipment or personal property, the Minister may, without any attaching liability, remove or demolish the same in whatever manner the Minister deems necessary. The Approval Holder(s) shall pay all expenses and costs of such removal or demolition.

i. The Minister or any employee, servant or agent of the Department will not be liable for any damage, loss or claim of any kind which may or hereafter arise.

j. If the Approval Holder(s) assigns or sublets their Approval or any part thereof except as is expressly provided herein, if the contractor becomes bankrupt or insolvent, if a receiver is appointed for any part of the assets of the Approval Holder(s), if any assignment is made for the benefit of the creditors of the Approval Holder(s), or if it is wound up or goes into liquidation, the Minister may terminate the Approval.

k. This Approval shall ensure to the benefit of and be binding upon the Minister, the Minister's successors, assigns and authorized representatives, and upon the Approval Holder(s), and the heirs, administrators, executors and assigns of the Approval Holder(s).

l. The failure of the Minister to insist upon a strict performance of any covenant, proviso or terms and conditions contained in this Approval shall not be deemed a waiver of any rights or remedies that the Minister may have and shall not be deemed a waiver of any subsequent breach or default in the covenants, provisos or terms and conditions contained in this Approval.

5. Construction

a. All construction activities within or immediately adjacent to the watercourse channel must be carried out in isolation of the streamflow (in the dry).

b. Prior to the commencement of the proposed activity, sediment control measures shall be installed to prevent sedimentation of the watercourse and maintained as required until all exposed erodible soil adjacent to both a watercourse and the road surface are stabilized. Erosion control measures include but are not limited to flow checks, sediment traps and/or filters.

c. Erosion control materials shall be clean, non-erodible, non-ore-bearing, non-watercourse derived and non-toxic materials. The Approval Holder(s) shall ensure the materials for this project, (i.e. aggregate, etc.) is suitable for the purpose intended.

d. Sulphide bearing materials are not to be used without prior written consent from the Minister. The Approval Holder(s) shall notify the Department immediately when sulphide bearing materials are encountered during any part of construction.

e. All potentially erodible areas shall be stabilized with erosion protection material as work progresses (not at the end of the project).

f. All work operations shall be conducted in a manner to protect the watercourse from siltation and disturbance to the adjacent and downstream areas. Silted water is not to be released directly into the watercourse. Any silt laden water pumped from work areas is to be directed to heavily vegetated areas, settling

ponds, or other treatment devices.

g. Any overland flow which has the potential to enter the construction area is to be diverted away from the construction site and into vegetated areas.

h. All construction site and roadway runoff shall be directed through natural vegetation before it reaches the watercourse. Where direction through natural vegetation is not possible, runoff shall be treated through erosion and sediment control devices to prevent siltation of watercourses.

i. Road drainage must not be discharged over a cut or fill unless appropriate vertically staged erosion control measures are in place on the slope from the crest to the toe along the face of the embankment.

j. Settling ponds shall meet a minimum requirement of 1/16 acre-ft. of storage for every acre of exposed construction area. Settling ponds are to be cleaned out when they are half full of sediment or when they no longer provide for the precipitation of solids.

k. The Approval Holder(s) shall ensure that the following discharge limits are met for any water which is discharged from the Site to a watercourse or wetland:

    i. Total Suspended Solids Clear Flows (Normal Background Conditions):

        (a) Maximum increase of 25 mg/L from background levels for any short term exposure (24 hours or less)

        (b) Maximum average increase of 5 mg/L from background levels for longer term exposure (inputs lasting between 24 hours and 30 days)

    ii. Total Suspended Solids High Flow (Spring Freshets and Storm Events):

        (a) Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 mg/L and 250 mg/L

        (b) Shall not increase more than 10% over background levels when background is >250 mg/L.

l. The Approval Holder(s) shall limit the size of the disturbed area to the area of the watercourse alteration. Once the soils in the area of installation have been exposed for installation, the structure installation shall commence immediately.

m. The Approval Holder(s) shall limit the removal of riparian vegetation to the area of the watercourse alteration only.

n. All excavated material shall be placed in a location where it will not enter the watercourse. All debris resulting from construction activities shall be disposed of at a facility which is approved to accept the specific material. Any material not regulated by the Department shall be removed to an area where flood water will

not come in contact with the debris and excavated material must be removed from the areas adjacent to the watercourse and be disposed of in a manner acceptable to the Department.

o. On site machinery and potential pollutants are to be stored in an area above the flood water limits.

p. Fuel storage and refuelling or lubrication of equipment is to take place in an area such that an accidental pollutant discharge will not enter surface water or domestic water supplies. Under no circumstances will the designated area be within 30 metres of a watercourse or wetland. Note: this clause is not applicable to pile-driving equipment.

q. Blasting in or near a watercourse is not permitted unless authorized in writing by the Minister.

r. Machinery and equipment (e.g., concrete trucks) are not to be washed out within 30 metres of a body of water or in an area where wash water will run into a watercourse.

s. Equipment required to work within a watercourse is to be mechanically sound, having no leaking fuel tanks or leaking hydraulic connections.

6. Spills or Releases

a. Spills or releases shall be reported in accordance with the Act and the Environmental Emergency Regulations.

b. Spills or releases shall be cleaned up in accordance with the Act and the Contaminated Sites Regulations.

7. Site Specific Conditions

a. All work must be carried out as per the application and supporting documentation.

b. All work must adhere to the 'Nova Scotia Watercourse Alteration Standard' where applicable for the activity.

c. Concrete used in a watercourse that has not been isolated from water flow must be pre-cast and cured away from the watercourse.

d. Concrete used in a watercourse that has been isolated from water flow must be permitted to cure long enough prior to releasing water flow so that it does not contaminate the water after the flow is released.

e. Machinery must not enter the watercourse unless the work area has been isolated from the stream flow.

f. An emergency spill-kit must be kept on site when vehicles (including machinery) or equipment is used in a watercourse.

NOVA SCOTIA

File No:95100-30-BED-2017-107037

COMPLETION OF THE APPROVED WORK

A condition of this Approval requires that the Approval Holder notify Nova Scotia Environment that the work authorized is complete.

Please enter the information on this sheet and return it to Nova Scotia Environment at the following address:

Nova Scotia Environment
Inspection, Enforcement, and Compliance Division
Central Region, Bedford Office
30 Damascus Road, Suite 115
Bedford, NS, B4A 0C1

Phone: 902-424-7773
Fax: 902-424-0597
NSE Contact: Stephanie Barkhouse

APPROVAL NUMBER: 2017-107037-00

NAME OF APPROVAL HOLDER: NOVA SCOTIA SALMON ASSOCIATION

WORK AUTHORIZED: Instream Structure

DATE WORK WAS COMPLETED: Oct. 30/2017 [Wetted by Oct. 1]

NAME OF CONTRACTOR: Hawes Trucking + Excavation

COMMENTS: Work proceeded generally as planned. The structure was relocated 50m downstream from originally-intended site.

Signature

March 15/2018
Date

NOVA SCOTIA

30 Damascus Road, Suite 115
Bedford NS
Canada B4A 0C1

902-424-7773 P
902-424-0597 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: NOVA SCOTIA SALMON ASSOCIATION

SITE PID: 40201048, 40220915, 40231722, 40232613

APPROVAL NO: 2018-105032-00

EXPIRY DATE: September 30, 2018

Pursuant to Part V of the *Environment Act*, S.N.S. 1994-95, c.1 s.1 as amended from time to time, approval is granted to the Approval Holder subject to the Terms and Conditions attached to and forming part of this Approval, for the following activity:

Water Approval - Instream Structure

Administrator: Kevin G Garroway

Effective Date: August 7, 2018

The Minister's powers and responsibilities under the Act with respect to this Approval have been delegated to the Administrator named above. Therefore, any information or notifications required to be provided to the Minister under this Approval can be provided to the Administrator unless otherwise advised in writing.

TERMS AND CONDITIONS OF APPROVAL

Nova Scotia Environment

Approval Holder: NOVA SCOTIA SALMON ASSOCIATION

Project: West River Sheet Harbour - PID 40220915, West River Sheet Harbour - PID 40231722, West River Sheet Harbour - PID 40201048, West River Sheet Harbour - PID 40232613

Site:

PID	Civic #	Street Name	Street Type	Community	County
40201048	1178	BEAVER DAM MINES	RD.	MARINETTE	HALIFAX COUNTY
40220915				SHEET HARBOUR	HALIFAX COUNTY
40231722				MARINETTE	HALIFAX COUNTY
40232613				SHEET HARBOUR	HALIFAX COUNTY

Approval No: 2018-105032-00

File No: 95100-30-BED-2018-105032

Grid Reference: Easting - 534683, Northing - 4979272, Easting - 528541, Northing - 4980284, Easting - 525891, Northing - 4982821, Easting - 522778, Northing - 4990186

Reference Documents

- Application submitted May 25, 2018 and attachments.

1. Definitions

a. Act means Environment Act, Chapter 1 of the Acts of 1994-95, and includes, unless the context otherwise requires, all regulations made pursuant to the Act.

b. Administrator means a person appointed by the Minister for the purpose of this Act, and includes an acting administrator.

c. Approval means an Approval issued pursuant to this Act with respect to an activity.

d. Arch or open-bottom box culvert means a structure which conveys the flow of a surface water body under a roadway, railway, canal or other impediment which completely spans the water body from bank to bank, is supported by footings and the top of the cover material is graded to form the travel surface.

e. Bridge means a structure which conveys the flow of a surface water body under a roadway, railway, canal or other impediment which completely spans the water body from bank to bank, is supported by abutments and has stringers and a deck which form the travel surface.

f. Culvert means a Pipe Culvert and/or an Arch or Open-Bottom Box Culvert.

g. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Central Region, Bedford Office
30 Damascus Road, Suite 115
Bedford, Nova Scotia B4A 0C1

Phone: (902) 424-7773
Fax: (902) 424-0597

h. Erosion Protection means protective works constructed along the banks of water bodies to prevent erosion by surface runoff, stream flows and/or wave action.

i. Harvest Block means a contiguous geographical area of land designated to have the trees or vegetation harvested.

j. Minister means the Minister of Environment and includes any person appointed as a designate of the Minister.

k. Nova Scotia Environment Watercourse Alteration Certification Training Manual means the training manual developed in accordance with the New Brunswick Watercourse Alteration Training Manual and Nova Scotia Watercourse Alteration Specifications current edition.

l. Pipe Culvert means a closed conduit used for the conveyance of surface water under a roadway, railway, canal or other impediment which is embedded into the bed of the surface water body.

m. Recognized Individual means an individual who has successfully completed the Nova Scotia Environment Watercourse Alteration Certification Training Program.

n. Site means the location of the authorized work.

o. Temporary Bridge means a portable structure which conveys the flow of a surface water body under a roadway, railway, canal or other impediment which completely spans the water body from bank to bank, is supported by abutments and has stringers and a deck which form the travel surface. A temporary bridge shall be designated to convey at least the equivalent flow from a 1 to 2 year return period storm event. A temporary bridge shall not remain in place for a period greater than 30 days.

p. Watercourse means the bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all groundwater.

q. Wetland means land commonly referred to as marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions.

2. Scope

a. This Approval (the "Approval") relates to the Approval Holder(s) and their application and supporting documentation, as listed in the reference documents above, to construct the Instream Structure on West River Sheet Harbour, West River Sheet Harbour, West River Sheet Harbour, West River Sheet Harbour situated at or near 1178 BEAVER DAM MINES RD.

b. Under authority of this Approval, the watercourse alterations specified herein shall be conducted between June 1st and September 30th (inclusive) of the same calendar year unless otherwise stated in the site specific terms and conditions.

c. Temporary bridges can be installed between September 30th of the application year and March 31st of the following year provided they are temporarily removed prior to a 1 in 2 year (or larger) storm rainfall event. Installations of temporary bridges are restricted to a maximum time period of 30 days in one location. A extension may be obtained in writing should the bridge be required to remain in use longer than 30 days in one location.

3. General

a. The Approval Holder(s) shall construct the watercourse alterations in accordance with provisions of the most recent version of:

i. Environment Act S.N.S. 1994-1995, c.1, s.1 as amended from time to time

ii. Regulations pursuant to the above Act, as amended from time to time

b. Nothing in this Approval relieves the Approval Holder(s) of the responsibility for

obtaining and paying for all licenses, permits, approvals or authorizations necessary for carrying out the work authorized to be performed by this Approval which may be required by municipal by-laws or provincial or federal legislation. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.

c. No authority is granted by this Approval to enable the Approval Holder(s) to construct the watercourse alterations on lands which are not in the control or ownership of the Approval Holder(s). It is the responsibility of the Approval Holder(s) to ensure that such a contravention does not occur. The Approval shall provide, to the Department, proof of such control or ownership upon expiry of any relevant lease or agreement. Failure to retain said authorization may result in this Approval being cancelled or suspended.

d. If there is a discrepancy between the reference documents and the terms and conditions of this Approval, the terms and conditions of this Approval shall apply.

e. The Minister may modify, amend or add conditions to this Approval at any time pursuant to Section 58 of the Act.

f. This Approval is not transferable without the consent of the Minister.

   i. If the Minister determines that there has been non-compliance with any or all of the terms and conditions contained in this Approval, the Minister may cancel or suspend the Approval pursuant to subsections 58A(1) and 58A(2) of the Act, until such time as the Minister is satisfied that all terms and conditions have been met

   ii. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act and regulations

g. The Approval Holder(s) shall notify the Department prior to any proposed extensions or modifications of the activities outlined in the original Application for Approval.

h. Pursuant to Section 60 of the Act, the Approval Holder(s) shall submit to the Minister any new and relevant information respecting any adverse effect that actually results, or may potentially result, from any activity to which the Approval relates and that comes to the attention of the Approval Holder(s) after the issuance of the Approval.

i. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

j. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

k. Unless specified otherwise in this Approval, all samples required to be collected by this Approval shall be collected, preserved and analysed, by qualified personnel, in accordance with recognized industry standards and procedures.

l. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analysed by a laboratory that meets the requirements of the Department's Policy on Acceptable Certification of Laboratories as amended from time to time.

m. The Approval Holder(s) shall submit any monitoring results or reports required by this Approval to the Department. Unless specified otherwise in this Approval, all monitoring results shall be submitted within 30 days following the month of monitoring.

n. The Approval Holder(s) shall ensure that this Approval, or a copy, is kept on site at all times and that personnel directly involved in the watercourse alterations are made fully aware of the terms and conditions which pertain to this Approval.

o. Failure to comply with the terms and conditions is an offence under the Environment Act.

p. The Approval Holder(s) shall notify the Department three business days prior to commencing construction of the Activity. The notification must include the Approval Number.

q. Within 14 days of completion of the work authorized under this Approval, the Approval Holder(s) is required to submit, to the Department, the enclosed form entitled Completion of the Approved Work.

4. Covenant Conditions

a. The Approval Holder(s) may alter the watercourse, or store water in any watercourse as authorized and, without limiting the generality of the foregoing, shall not alter or use the watercourse so as to:

   i. prejudice any riparian rights of any owner or of any person lawfully in possession of or holding any lands abutting the watercourse or any rights therein

   ii. suffer any loss, damage or nuisance to adjacent or abutting lands

b. The Approval Holder(s) shall not, at any time or for any purpose, place a pecuniary value on or claim any pecuniary value for the rights and privileges granted by this Approval, whether considered alone or in conjunction with any other property rights or privileges, over and above the amounts, if any, actually paid to the Minister by the Approval Holder(s) for said rights and privileges.

c. It is recognized and agreed that this Approval does not give sole or exclusive

rights to any watercourse, and the Minister reserves the right to use the watercourse and water therein for any purpose and to allow others to use the watercourse and water for any purpose, provided that such use or purpose does not constitute a substantial interference with the rights granted to the Approval Holder(s).

d. The Approval Holder(s) shall be responsible for obtaining and paying the costs of any and all approvals, services, easements, rights of way and authorizations of any kind necessary for the performance of any activities undertaken pursuant to this Approval. The Minister does not covenant that such approvals, services, easements, rights of way and authorizations of any kind will be issued by the Province of Nova Scotia, any other body or person.

e. The Approval Holder(s) shall maintain any bridge, culvert, dam, sluice, flume, conduit or other structure built or used in or on the watercourse in a state of good repair and in a clean and tidy condition to the satisfaction of the Minister. The Approval Holder(s) shall conform to any and all directions of the Minister concerning the rehabilitation of a watercourse or the construction, reconstruction, maintenance, removal, operation and location of any bridge, culvert, dam, sluice, flume, conduit or other structure built, used or maintained in and on the watercourse.

f. The Approval Holder(s) shall indemnify and save harmless the Minister against any loss, cost or damage occasioned by the Approval Holder(s)'s relocation of a watercourse or the construction of, repair, alteration or addition to any culvert, bridge, dam, sluice, flume, conduit or other structure. Such indemnity shall include, but not be restricted to, all losses, costs or damages occasioned by the improper or faulty relocation of a watercourse or the improper or faulty construction of repair, alteration or addition to any culvert, bridge, dam, sluice, flume, conduit or other structure in or on the watercourse, or by any trespass, negligence or willful act of the Approval Holder(s) or any employees, agents, contractors, or guests of the Approval Holder(s).

g. On the expiry or termination of this Approval or at the end of the useful life of the structure, as determined by the Minister, the Approval Holder(s) shall immediately cease operations and peaceably and quietly yield up and deliver possession of the watercourse in a condition satisfactory to the Minister, and the Minister shall incur no further expense, liability or cost in this regard.

h. The Approval Holder(s) shall remove any bridge, culvert, dam, sluice, flume, conduit or other structure or remnants thereof, and any equipment or personal property built, used or maintained in and on the watercourse at the end of the useful life of the structure, to the satisfaction of the Minister. In the event the Approval Holder(s) fails to remove such bridge, culvert, dam, sluice, flume, conduit or other structure or remnants thereof and any equipment or personal property, the Minister may, without any attaching liability, remove or demolish the

same in whatever manner the Minister deems necessary. The Approval Holder(s) shall pay all expenses and costs of such removal or demolition.

i. The Minister or any employee, servant or agent of the Department will not be liable for any damage, loss or claim of any kind which may or hereafter arise.

j. If the Approval Holder(s) assigns or sublets their Approval or any part thereof except as is expressly provided herein, if the contractor becomes bankrupt or insolvent, if a receiver is appointed for any part of the assets of the Approval Holder(s), if any assignment is made for the benefit of the creditors of the Approval Holder(s), or if it is wound up or goes into liquidation, the Minister may terminate the Approval.

k. This Approval shall ensure to the benefit of and be binding upon the Minister, the Minister's successors, assigns and authorized representatives, and upon the Approval Holder(s), and the heirs, administrators, executors and assigns of the Approval Holder(s).

l. The failure of the Minister to insist upon a strict performance of any covenant, proviso or terms and conditions contained in this Approval shall not be deemed a waiver of any rights or remedies that the Minister may have and shall not be deemed a waiver of any subsequent breach or default in the covenants, provisos or terms and conditions contained in this Approval.

5. Construction

a. All construction activities within or immediately adjacent to the watercourse channel must be carried out in isolation of the streamflow (in the dry).

b. Prior to the commencement of the proposed activity, sediment control measures shall be installed to prevent sedimentation of the watercourse and maintained as required until all exposed erodible soil adjacent to both a watercourse and the road surface are stabilized. Erosion control measures include but are not limited to flow checks, sediment traps and/or filters.

c. Erosion control materials shall be clean, non-erodible, non-ore-bearing, non-watercourse derived and non-toxic materials. The Approval Holder(s) shall ensure the materials for this project, (i.e. aggregate, etc.) is suitable for the purpose intended.

d. Sulphide bearing materials are not to be used without prior written consent from the Minister. The Approval Holder(s) shall notify the Department immediately when sulphide bearing materials are encountered during any part of construction.

e. All potentially erodible areas shall be stabilized with erosion protection material as work progresses (not at the end of the project).

f. All work operations shall be conducted in a manner to protect the watercourse

from siltation and disturbance to the adjacent and downstream areas. Silted water is not to be released directly into the watercourse. Any silt laden water pumped from work areas is to be directed to heavily vegetated areas, settling ponds, or other treatment devices.

g. Any overland flow which has the potential to enter the construction area is to be diverted away from the construction site and into vegetated areas.

h. All construction site and roadway runoff shall be directed through natural vegetation before it reaches the watercourse. Where direction through natural vegetation is not possible, runoff shall be treated through erosion and sediment control devices to prevent siltation of watercourses.

i. Road drainage must not be discharged over a cut or fill unless appropriate vertically staged erosion control measures are in place on the slope from the crest to the toe along the face of the embankment.

j. Settling ponds shall meet a minimum requirement of 1/16 acre-ft. of storage for every acre of exposed construction area. Settling ponds are to be cleaned out when they are half full of sediment or when they no longer provide for the precipitation of solids.

k. The Approval Holder(s) shall ensure that the following discharge limits are met for any water which is discharged from the Site to a watercourse or wetland:

    i. Total Suspended Solids Clear Flows (Normal Background Conditions):

        (a) Maximum increase of 25 mg/L from background levels for any short term exposure (24 hours or less)

        (b) Maximum average increase of 5 mg/L from background levels for longer term exposure (inputs lasting between 24 hours and 30 days)

    ii. Total Suspended Solids High Flow (Spring Freshets and Storm Events):

        (a) Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 mg/L and 250 mg/L

        (b) Shall not increase more than 10% over background levels when background is >250 mg/L.

l. The Approval Holder(s) shall limit the size of the disturbed area to the area of the watercourse alteration. Once the soils in the area of installation have been exposed for installation, the structure installation shall commence immediately.

m. The Approval Holder(s) shall limit the removal of riparian vegetation to the area of the watercourse alteration only.

n. All excavated material shall be placed in a location where it will not enter the

watercourse. All debris resulting from construction activities shall be disposed of at a facility which is approved to accept the specific material. Any material not regulated by the Department shall be removed to an area where flood water will not come in contact with the debris and excavated material must be removed from the areas adjacent to the watercourse and be disposed of in a manner acceptable to the Department.

o. On site machinery and potential pollutants are to be stored in an area above the flood water limits.

p. Fuel storage and refuelling or lubrication of equipment is to take place in an area such that an accidental pollutant discharge will not enter surface water or domestic water supplies. Under no circumstances will the designated area be within 30 metres of a watercourse or wetland. Note: this clause is not applicable to pile-driving equipment.

q. Blasting in or near a watercourse is not permitted unless authorized in writing by the Minister.

r. Machinery and equipment (e.g., concrete trucks) are not to be washed out within 30 metres of a body of water or in an area where wash water will run into a watercourse.

s. Equipment required to work within a watercourse is to be mechanically sound, having no leaking fuel tanks or leaking hydraulic connections.

6. Spills or Releases

a. Spills or releases shall be reported in accordance with the Act and the Environmental Emergency Regulations.

b. Spills or releases shall be cleaned up in accordance with the Act and the Contaminated Sites Regulations.

7. Site Specific Conditions

a. All work activities shall adhere to Sections 3.1 to 3.5 of the Nova Scotia Watercourse Alterations Standard (2015).

b. Work and erosion and sediment control (ESC) activities are summarized in Table A-1, Appendix A and site plans available in Appendix B. The Approval Holder(s) shall immediately notify the Department of any changes in the proposed work plan and/or ESC activity due to site conditions.

c. An emergency spill-kit must be kept on site when vehicles (including machinery) or equipment is used in a watercourse.

d. The Approval holder shall ensure that the elevation of the intake pipe for the lime doser (installed under Approval 2017-107037) is not increased.

NOVA SCOTIA

File No:95100-30-BED-2018-105032

COMPLETION OF THE APPROVED WORK

A condition of this Approval requires that the Approval Holder notify Nova Scotia Environment that the work authorized is complete.

Please enter the information on this sheet and return it to Nova Scotia Environment at the following address:

Nova Scotia Environment
Inspection, Enforcement, and Compliance Division
Central Region, Bedford Office
30 Damascus Road, Suite 115
Bedford, NS, B4A 0C1

Phone: 902-424-7773
Fax: 902-424-0597
NSE Contact: Kelly L Henderson

APPROVAL NUMBER: 2018-105032-00

NAME OF APPROVAL HOLDER: NOVA SCOTIA SALMON ASSOCIATION

WORK AUTHORIZED: Instream Structure

DATE WORK WAS COMPLETED: _____

NAME OF CONTRACTOR: _____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

Appendix A – Table

Approval 2018-105032

Table A-1: Erosion and Sediment Control and Work Activities

Location	ESC and work activity of Eastern side of river	ESC and work activity of Western side of river
Killam Lime Doser repair	Water diversion (partially coffered and water diverted from the work site) and a trash pump will be used to pump water, if required.	None - Work spans the river from bank-to-bank. The machine will be positioned on the Western Bank.
Repair habitat structures installed in 2016/2017	None – repair to structures will occur on the stream bank and outside of the water	None - repair to structures will occur on the stream bank and outside of the water. The machine may have to traverse (right angle crossing) to access the site.
Site 19	Water diversion (out of flow) – excavator complete deflector installation from bank	None - excavator single traverse near end of installation to construct submerged rock sill and smaller deflector
Site 20	Water diversion (out of flow) – excavator complete deflector installation from bank	None - excavator traverse twice (right angle crossing) near end of installation to construct rock sill and deflector
Site 21	Water diversion (out of flow) – excavator complete deflector installation from bank	None - excavator single traverse (right angle crossing) near end of installation to construct submerged rock sill and smaller deflector
Site 22	Water diversion (in the dry) – excavator complete deflector installation from bank	None - excavator single traverse (right angle crossing) near end of installation to construct submerged rock sill and smaller deflector
Site 23	Water diversion (in the dry) – excavator complete deflector installation from bank	None - excavator single traverse (right angle crossing) near end of installation to construct submerged rock sill and smaller deflector
Site 56 to 63	None - excavator single traverse (right angle crossing) near end of installation to construct rock sill and smaller deflector	Water diversion (out of flow) – excavator complete deflector installation from bank

Notes:
ESC – erosion and sediment control
Water Diversion – Temporary Plywood coffer dam to deflect water flow away from work site. Plywood wall installed in river bed with 3/4" rebar. Plywood covered in plastic tarps to provide seal at streambed and prevent water entering work zone.
Direction based on river running north to south
Site Access:

- Sites 19 and 20 have road access. No instream movement of excavator is required.
- Access between Sites 20 and 23 are expected to be done by walking the excavator along the river bank.
- Sites 56 to 63 will be access by existing wood road on the west side of the river and final approaches will be through a clear cut. No instream movement of excavator is required.

See appendix B for site plans.

Appendix B – Site Plans

Approval 2018-105032

Sites 19 to 23

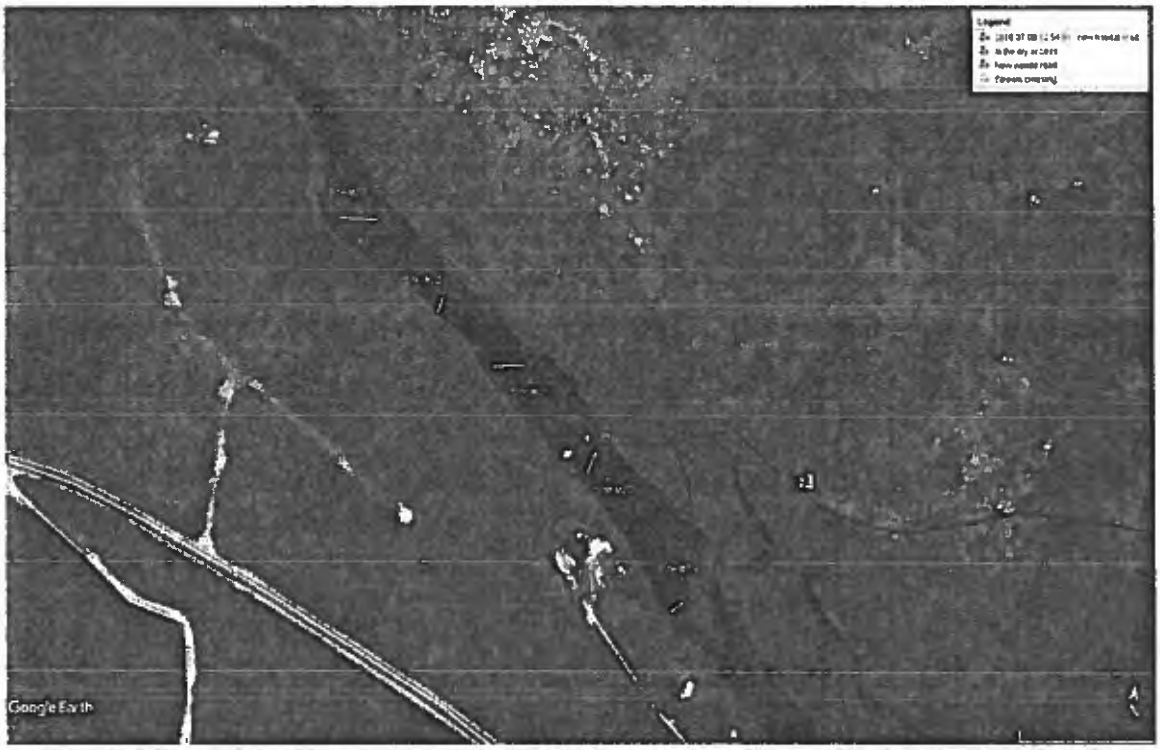


Figure 1 – Expected location of a) road access (blue), stream work that can be done with the machine on the bank or out of the water on top of newly constructed habitat structures (green) and expected locations of stream crossing by the excavator (yellow). Shown are sites #19 – 23.

Sites 56 to 63

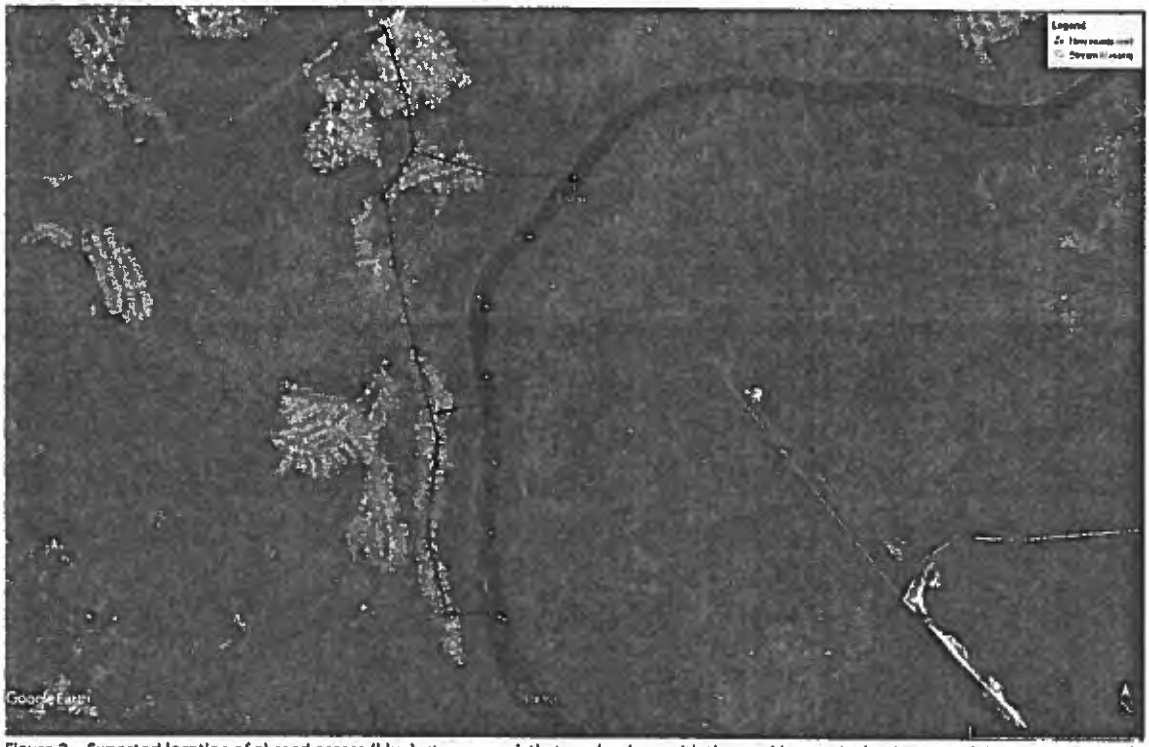


Figure 2 – Expected location of a) road access (blue), stream work that can be done with the machine on the bank or out of the water on top of newly constructed habitat structures (green) and expected locations of stream crossing by the excavator (yellow). Shown are sites #56 – 63.

Appendix C – DFO Review

Approval 2018-105032

Fisheries and Oceans Canada | Pêches et Océans Canada

Bedford Institute of Oceanography
1 Challenger Drive
P.O. Box 1006, Station P410
Dartmouth, Nova Scotia, B2Y 4A2

June 25, 2018

Your file / Votre référence
2018-105032

Our file / Notre référence
18-W-210

Kelly Henderson
Nova Scotia Environment
30 Damascus Rd. Suite 115
Bedford, NS
B4A 0C1

Subject: West River Sheet Harbour, Habitat Restoration– Serious Harm to Fish and Prohibited Effects on Listed Aquatic Species at Risk Can Be Avoided or Mitigated

Dear Ms. Henderson:

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received the proposal on May 30th, 2018. We understand that the proponent proposes to:

- Install rock stills to restore pool riffle structure and improve fish migration, spawning and rearing habitats. Repair intake of Killag River lime doser, repair habitat restoration structures installed in 2016-2017, install 5 new habitat restoration structures in the lower West River (#19-23) and install 8 new habitat restoration structures in the middle West River (#56-63).

Our review considered the following information:

- Nova Scotia Environment Application for Approval and all supporting documents and plans – file #2018-105032 received on May 31st, 2018.

The proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act* unless authorized. The proposal has also been reviewed to determine whether it is likely to affect listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*, unless authorized.

Provided that the plans are implemented in the manner, and during the timeframe, described, the Program has determined that the proposal will not result in serious harm to

Canada

fish or prohibited effects on listed aquatic species at risk. As such, an authorization under the *Fisheries Act* or a permit under the *Species at Risk Act* is not required.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to avoid causing serious harm to fish in compliance with the *Fisheries Act*, and avoid prohibited effects on listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in compliance with the *Species at Risk Act*.

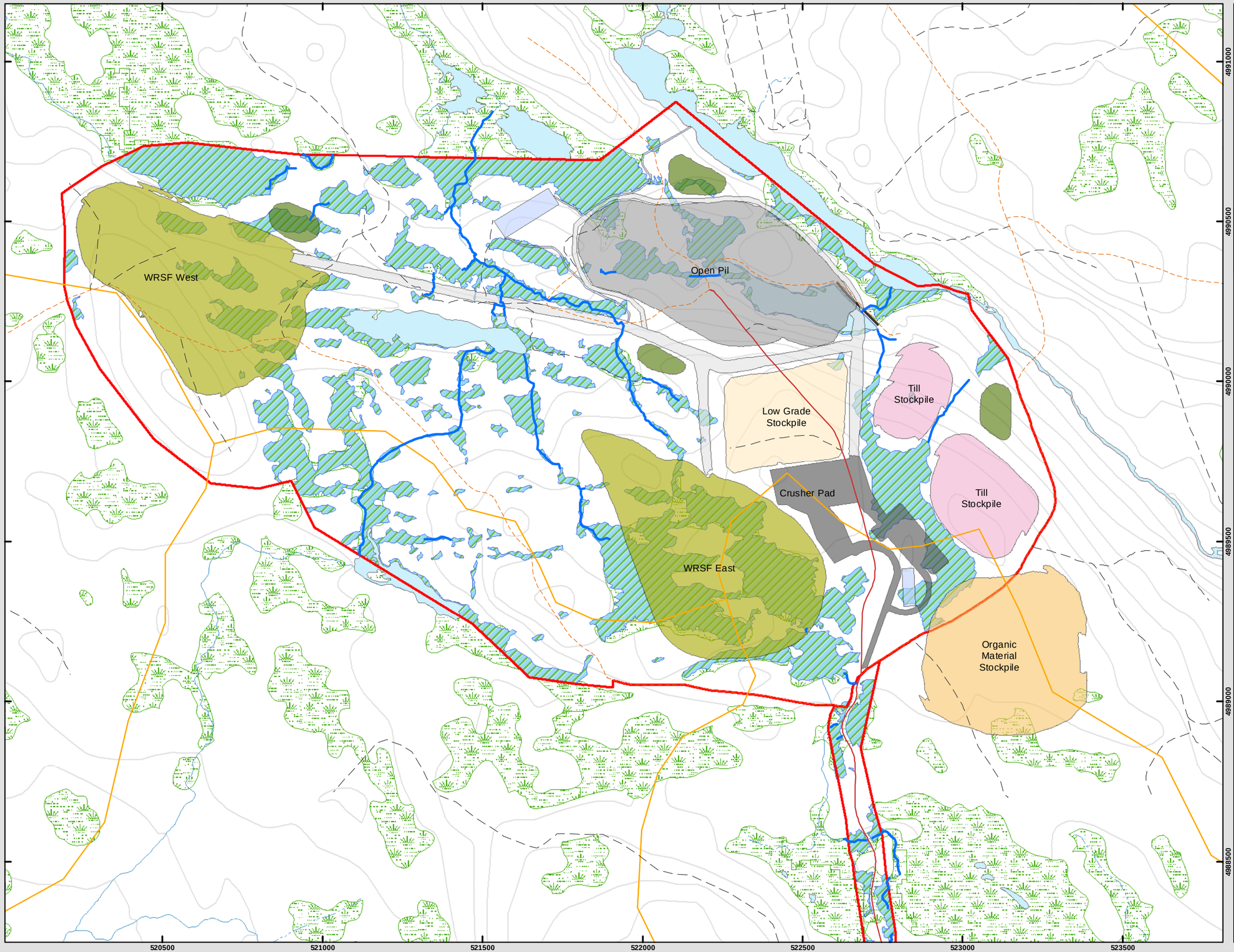
It is also your *Duty to Notify* DFO if you have caused, or are about to cause, serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery. Such notifications should be directed to http://www.dfo-mpo.gc.ca/pnw-ppe/violation-infraction/index-eng.html.

A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Tanya Pelrine at our Dartmouth office at 902-402-2578 or by email at tanya.pelrine@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Tanya Pelrine
Hydro and Flows Biologist
Fisheries Protection Program



Prepared For:

ATLANTICGOLD

FIGURE 1
Beaver Dam
EIS Infrastructure Layout
UPDATE 27-JUN-19

Location
Melrose, NS

Updated Infrastructure

- LG SP
- Open Pit
- Crusher Pad
- Organic Material Stockpile
- Road
- Topsoil Stockpile
- Till Stockpile
- WRSF
- Water Management
- Tertiary Watershed Boundaries
- Field Delineated Watercourses
- Field Delineated Wetlands
- NSE Wetlands
- Project Area

Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter

0 125 250 500 m

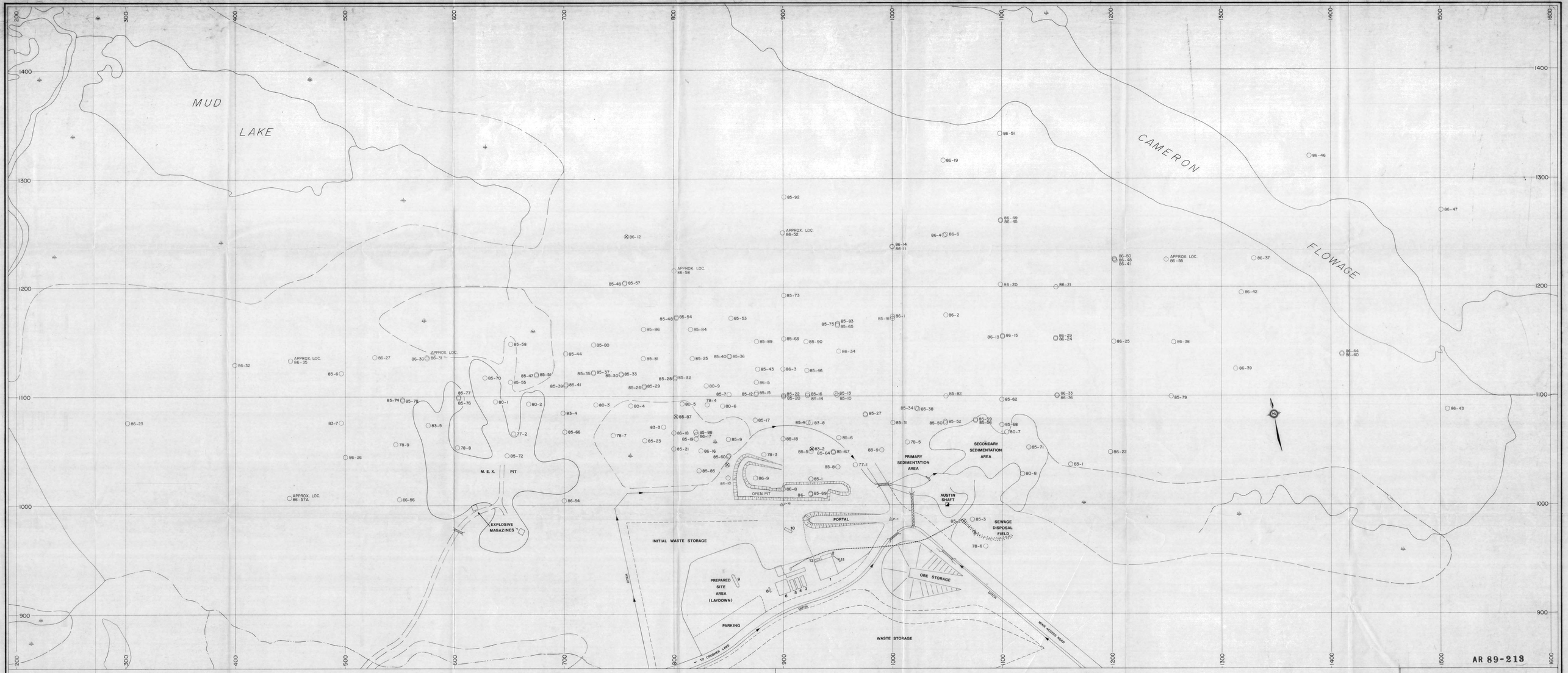
1:11,000 Scale when printed @ 11" x 17"

Drawn By: LP

Date: 6/27/2019

McCallum Environmental Ltd.

Document Name: 190627 INFRASTRUCTURE UPDATE



AR 89-213

LEGEND

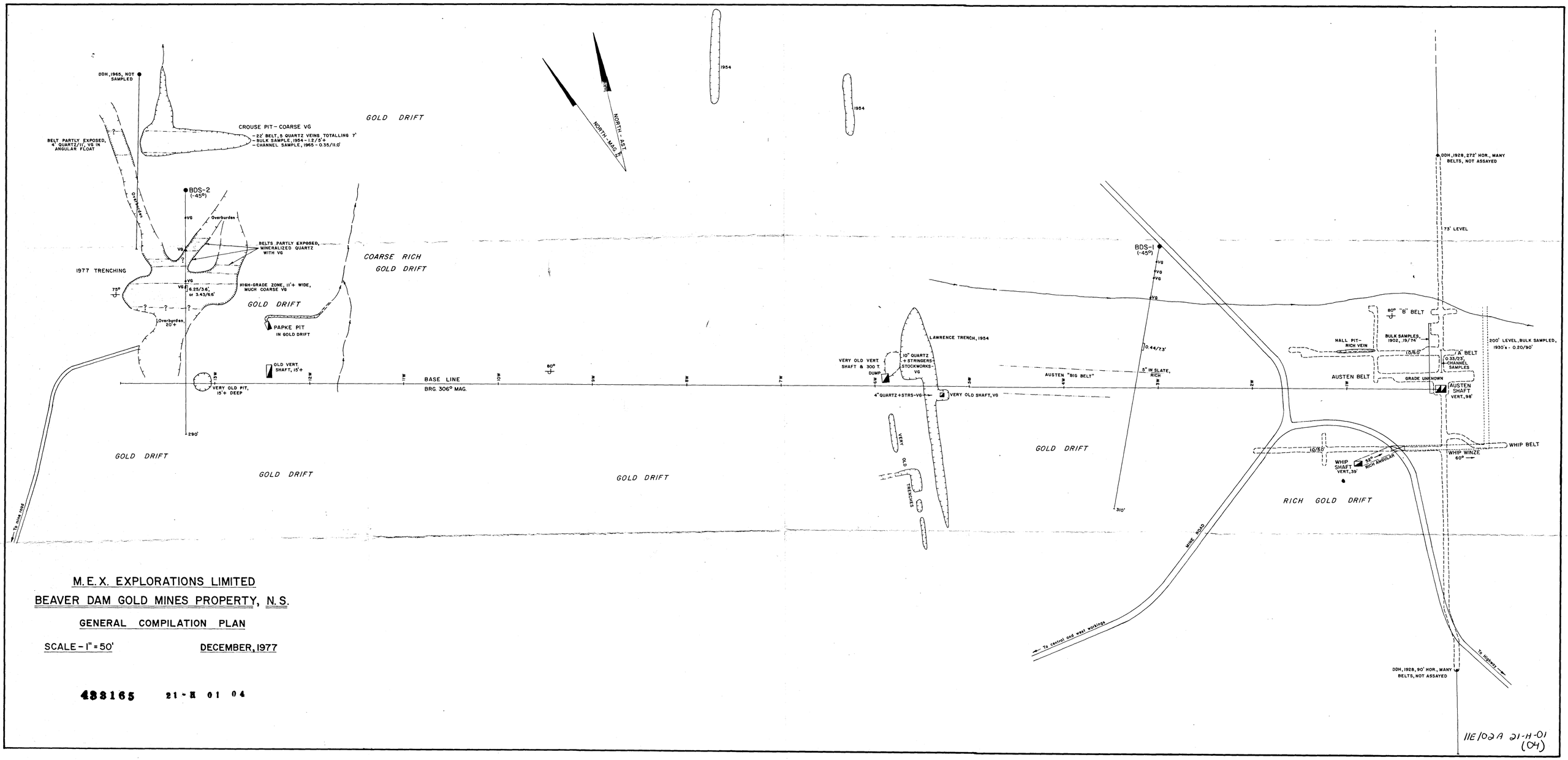
1 MAINTENANCE SHOP	7 SEWAGE TANKS	SEDIMENT RETRACTION WEIR	APPROXIMATE HOLE LOCATION	CEMENTED AND SURVEYED
2 GENERATOR AND COMPRESSOR	8 PROPANE TANK FOR DRY	CULVERT	86-30 HOLE IDENTIFICATION NUMBER	SURVEYED ONLY
3 FIRST AID	9 MOBILE STORAGE TANK (DIESEL)	DRAINAGE DITCH	STREAM	CEMENTED ONLY
4 OFFICE	10 WATER STORAGE TANK	MINE WATER DISCHARGE LINE	SWAMP	PARTIALLY CEMENTED
5 OFFICE	11 GENERATOR FUEL TANK	COMPRESSED AIR INTAKE LINE	SURVEYED CONTROL STATIONS	DESTROYED, NOT CEMENTED
6 DRY	12 COMPRESSED AIR TANK	SEWAGE LINE	WASTE STORAGE BOUNDARY	NOT LOCATED

SEABRIGHT RESOURCES INC.

BEAVER DAM PROJECT

PLAN VIEW SHOWING DRILL HOLE LOCATIONS AND SITE PLAN

WORK BY	DATE REVISED	SCALE 1:1000
DRAWN BY D.M.C	PROJECT NO.	REPORT NO.
DATE	N.T.S.	FIGURE 3



M.E.X. EXPLORATIONS LIMITED

BEAVER DAM GOLD MINES PROPERTY, N.S.

GENERAL COMPILATION PLAN

SCALE – 1" = 50' DECEMBER, 1977

433165 21-H 01 04

11E/02A 21-H-01 (04)

BEAVER DAM GOLD DISTRICT

SCALE 1 INCH = 200 FEET
Surveyed in 1902 by E R Fairbault Geological survey
" " 1928

No 7

LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT – BEAVER DAM PROPERTY

181 Beaver Dam Mines Road, Marinette, NS

August 23, 2019

Prepared for:

Atlantic Mining NS Corporation

Prepared by:

Stantec Consulting Ltd.
102-40 Highfield Park Drive
Dartmouth, NS B3A 0A3

File: 121619250.2500.955

Executive Summary

At the request of Atlantic Mining NS Corporation, Stantec Consulting Ltd. (Stantec) conducted a Limited Phase II Environmental Site Assessment (ESA) between July 10 and July 11, 2019 at the proposed Atlantic Gold Beaver Dam Project property (the 'Site') located near Marinette, Nova Scotia. The purpose of the Limited Phase II ESA was to assess soil and surface water conditions at the Site with respect to historical mining operations including tailings and waste rock disposal areas identified in the Draft Phase I ESA completed by Stantec in August 2019.

The scope of the Limited Phase II ESA consisted of the following:

- Complete a visual site reconnaissance to identify areas of potential environmental concern.
- Excavate up to 40 test pits in the area of the proposed open pit and collect representative soil samples to assess the extent of metals impacts in soil from historical tailings storage at the Site.
- Collect up to five surface water samples in the area of the proposed open pit to assess the extent of metals impacts in surface water.

Based on the information gathered and on observations made during this assessment, Stantec provides the following conclusions:

- Possible tailings were visually observed in the stratigraphy of eight test pits and waste rock (WR) within four of the 29 test pits excavated as part of field activities completed between July 10 to 11, 2019. Note that visual observation of possible tailings is not necessarily indicative of elevated arsenic concentrations at that location.
- Concentrations of arsenic in soil exceeding the applicable Nova Scotia Environment (NSE) Tier 1 Environmental Quality Standards (EQS) were identified in 25 of the 29 test pit locations. The highest concentrations of arsenic are localized in the area of the Austen shaft operated in the 1980s. Concentrations of arsenic exceeding the applicable Tier 1 EQS were also identified in the areas of re-grading following site activities south of the Austen shaft area and north of Crusher Lake where historical stamp mills were operated in the late 1920s. Areas containing elevated gold concentrations tend to have elevated concentrations of arsenic due to the presence of arsenopyrite that is common in the geology of the area. Therefore, elevated arsenic concentrations are expected to be present across the Site.
- Possible waste rock was visually observed at four of the 29 test pit locations. Two of test pits were located adjacent to the Austen shaft and adjacent mine workings and two test pits were located in the identified waste rock near the historical M.E.X pit during the 1970s.
- Concentrations of aluminum, arsenic, cadmium, chromium and iron exceeding the applicable NSE Tier 1 EQS were identified in surface water samples analyzed. The detected concentrations of metals included under the *Metal and Diamond Mining Effluent Regulations* (MDMER) did not exceed Authorized Limits in any of the samples.
- The only concentration of arsenic was detected in the surface water sample collected with the settling pond immediately adjacent to the dam area constructed in the 1980s. No samples collected elsewhere within streams exceeded the Tier 1 EQS for arsenic.

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1.0 INTRODUCTION

1.1 GENERAL

At the request of Atlantic Mining NS Corporation, Stantec Consulting Ltd. (Stantec) conducted a Limited Phase II Environmental Site Assessment (ESA) of the proposed Atlantic Gold Beaver Dam Project property located near Marinette, Nova Scotia (NS) (refer to Figure 1, Appendix A). The purpose of the Limited Phase II ESA was to assess soil and surface water conditions at the Site with respect to historical mining operations including tailings and waste rock disposal areas identified in the Phase I ESA completed by Stantec in August 2019.

It is Stantec's understanding that the Limited Phase II ESA is required as part of project feasibility due diligence which is underway for the potential re-development of the Site as an open-pit mine operation. The general site location and location of the proposed open pit are shown on Figure 1, Appendix A. The current investigation was limited to the area of the Site consisting of the proposed open pit, ancillary mining infrastructure and surrounding area.

1.2 SITE DESCRIPTION

1.2.1 Subject Property and Surrounding Land Use

The Site is located in a rural forested area near Marinette, a region of Halifax Regional Municipality, NS. The Site is located 7 km northeast of Route 224 along Beaver Dam Mine Road which is a gravel road located approximately 17 km north-northwest of Sheet Harbour, Nova Scotia.

The Site consists of portions of several different properties owned by Northern Timber Nova Scotia Corp; Property Identification Numbers (PID) include:

- PID 40200990, Grant 13245;
- PID 40201014, Grant 15833;
- PID 40201022, Grant 13818;
- PID 41202359, Grant not listed;
- PID 40201071, Grant not listed;
- PID 40201006, Grant 14028;
- PID 40201030, Grant 9805;
- PID 41202334, Grant not listed;
- PID 40469405, Grant not listed;
- PID 40201048, Grant not listed;
- PID 00541656. Grant 10271;
- PID 40200941, Grant not listed;
- PID 40201063, Grant (portion of) 13245;
- PID 41202342, Grant (portion of) 13245

The proposed mine and operations footprint covers a large lower portion of PID 00541656 and several others to the south, bounded by the Cameron Flowage (part of the Killaq River) to the east, Crusher Lake to the west and the approximate property lines of PID 40201030 and 41202334 to the south.

The locations of the proposed open pit and ancillary mining infrastructure as well as the mine development area are shown on Figure 1, Appendix A. The proposed open pit partially encompasses the area of historical mine workings and is located immediately south of the Cameron Flowage in the vicinity of the former Austin shaft and northwest of the historical settling pond (refer to inset, Figure 1, Appendix A).

There are no permanent buildings on the Site. The site hosts old mine workings, waste rock piles, dam structures, access roads, an old “lime” station constructed along the Killaq River in 2016 by a local salmon association and abandoned cabins. The Site is industrial in nature; Stantec is not aware of any plans to change this land use in the foreseeable future.

Site details are provided on Figure 1, Appendix A. Surrounding land use is summarized in Table 1.

Table 1 Adjoining Properties – Current Land Use

Direction	Current Land Use	Current Occupant
North	Undeveloped, forested	None
South	Undeveloped, forested	None
East	Undeveloped, forested	None
West	Undeveloped, forested	None

1.2.2 Site Services

The property is not currently serviced, being in a rural portion of the province. Though evidence of historical mining was present including waste rock piles, dams, and laydown areas, there were no obvious foundations of stamp mills or infrastructure related to historical operations. The ruins of an old cabin are located north of Crusher Lake in the vicinity of Forge Hill. On the northeast corner of Crusher Lake there was a cluster of informal cottages which was identified as a squatters camp. The camp consisted of four buildings that appear to be in a state of disrepair (Stantec, 2019).

Based on the Nova Scotia Groundwater Atlas accessed July 2019, there are no drinking water wells on the Site. The mapping does illustrate numerous drill location from the various exploration drilling programs that have been conducted on the Site surface. Stantec did identify monitoring well clusters on the Site during the July site visit. Adjacent to the wells were coils of plastic tubing suggesting that they have been sampled in the past. Since the wells were located in clusters they are likely drilled to different depths. No reports for these wells were provided to Stantec and groundwater data was not reviewed or included in this report.

1.2.3 Topography and Regional Drainage

Based on available topographic maps and the observed site topography, the Site is located in an area of low topographic relief around an elevation of 140 metres (m) with scattered drumlins reaching 160 m. The surfaces of the Site consist of a combination of open wetland, rock piles and woodland. There are a number of boggy and forested areas within the property (FSSI Consultants (Aust) Pty. Ltd, 2015). Vegetation consists of spruce, fir and some hardwood. Logging has been widely carried out more recently including clear cutting in the immediate area of the deposit. Constructed or remains of various dams along local water ways, surface mining and excavation of numerous mine shafts/pits are located at the site.

Stormwater is anticipated to drain by infiltration and/or overland flow. Locally, water in the eastern portion of the Site is directed toward an artificial settling pond with the remains of a dam which is maintaining the water level in the pond.

Based on an available topographic map and the observed site topography, regional undisturbed surface drainage (anticipated shallow groundwater flow direction) appears to be to the north toward Crusher Lake, then via an unnamed brook to Mud Pond with eventual outflow into Killag River and Cameron Flowage. It should be noted that the direction of the shallow groundwater flow in limited areas can also be influenced by the presence of underground mine workings and is not necessarily a reflection of regional or local groundwater flow or a replica of the Site or area topography.

1.2.4 Surficial and Bedrock Geology

Based on an available surficial geology map, the native surficial soils of the Site consist of glacial till. The characteristic permeability of these soils is moderate. A site-specific determination would be required in order to obtain detailed soil profile and permeability information.

The Beaver Dam Property lies within the argillite-dominated basal greywacke, meta-sediments and minor quartzite of the Moose River Member of the Goldenville Formation (Nova Scotia Department of Natural Resources, 2000) which also hosts the Touquoy deposit 19 km to the southwest and the Fifteen Mile Stream gold deposit 17 km to the northeast. The Beaver Dam deposit is hosted in the southern limb of a north-dipping overturned anticline that hosts the vein gold mineralization.

1.3 PREVIOUS ENVIRONMENTAL REPORTS

Environmental work previously conducted at the Site by Stantec and others includes the following, which were reviewed by Stantec as part of the Phase II ESA:

- *Appendix N.1 Archaeological Assessment Beaver Dam Mine Site - part of the Beaver Dam Mine Project - Revised Environmental Impact Statement, Marinette, Nova Scotia. Prepared by Cultural Resources Management Group Limited for Conestoga-Rovers & Associates. Dated March 2015, CRM Project No. 2014-0015-01.*
- *Report Nova Scotia Department of Mines and Energy on Environmental Assessment of Beaver Dam Exploration, Beaver Dam, Nova Scotia. Prepared for Seabright Resources Inc. by Jacques Whitford*

(now Stantec), report dated June 27, 1986, File No. M1285. Department of Natural Resources File No. PR 86-005.

- *Stantec Consulting Ltd., 2019. Draft – Phase I Environmental Site Assessment, Beaverdam Property, 181 Beaver Dam Mines Rd., Marinette, NS. Prepared for Atlantic Mining NS Corporation. August 6, 2019.*

The Phase I ESA completed at the Site by Stantec in August 2019 revealed evidence of actual and potential environmental contamination associated with the Site. Based on the information gathered, the Phase I ESA concluded that there are un-reclaimed tailings which may contain elevated arsenic and mercury levels on the Site, or have acid generating potential, near the Austen shaft; settlement pond and associated mine workings, trenching and historical pits which exist within and extend outside of the proposed open pit development area. Suspected tailings and waste rock generated most recently in the 1980s are mostly present in the vicinity of the Austen shaft and settlement pond located immediately west of the Cameron Flowage or were used to re-grade the site. Smaller piles of suspected waste rock were noted in the northern area of Crusher Lake and Forge Hill area, where an historical stamp mill operation occurred during the late 1920s. No reclamation of the older tailings or spread waste rock in the area was identified.

As part of the Phase I ESA, Stantec conducted LIDAR analysis to produce a Digital Elevation Model (DEM) of the Site which was used to approximately delineate potential historical tailings and waste rock storage areas prior to conducting the Phase I ESA site visit.

1.4 POTENTIAL SOURCES OF ENVIRONMENTAL IMPACTS

Table 2 provides a summary of potential sources of environmental impacts as identified in the Phase I ESA completed by Stantec in August 2019.

Table 2 Potential Sources of Environmental Impacts

Location	Potential Concern	Source
Austen Shaft Area	Potential elevated arsenic and mercury levels in tailings.	Phase I ESA
Crusher Lake	Potential elevated arsenic and mercury levels in tailings.	Phase I ESA
Settlement Pond and dam area	Potential elevated arsenic and mercury levels in tailings.	Phase I ESA
Waste Rock Dump Areas	Waste rock potentially arsenic containing and having acid generating potential.	Phase I ESA

1.5 REGULATORY FRAMEWORK

Nova Scotia Environment (NSE) released its *Contaminated Sites Regulations* on July 6, 2013 which provide the requirements for notification of contaminated sites, as well as the basis for determining the appropriate numerical remediation levels, or ongoing site exposure management measures, applicable to a contaminated site.

The overall regulatory goals for remediation are to manage contamination to reduce related risks to acceptable levels for humans and the environment (i.e. ecology). These goals may be met by a variety of

means acceptable to NSE, from cleanup at the conservative generic (Tier 1) level, to cleanup based on site-specific conditions (Tier 2), to long-term exposure management of site contamination through engineered, physical or administrative controls.

Tier 1 Environmental Quality Standards (EQS) are substance generic environmental quality standards that may be used for remediation levels. These standards represent a standardized level of risk for contributing pathways, based on land use and other factors. Use of the Tier 1 EQS for remediation is a conservative and typical application of cleanup standards. The Tier 1 EQS incorporate human health and ecological effects where applicable.

Analytical results for soil and surface water have been compared to the applicable Tier 1 EQS for an industrial site with potable groundwater use and coarse-grained soil. Note that for metals, the Tier 1 EQS for a potable and non-potable site are equivalent.

Based on the presence of historical mine workings and tailings storage on the Site, the analytical results for surface water have also been compared to the *Metal and Diamond Mining Effluent Regulations* (MDMER) (DFO, 2018). The regulations provide Authorized Limits of Deleterious Substances for mine site effluent, which includes surface runoff "that flows over, through or out of the site of a mine". Authorized Limits are provided for monthly mean concentrations, composite samples, and grab samples.

Table 3 provides a summary of applicable guidelines considered in this assessment.

Table 3 Summary of Regulatory Framework

Media	Metals
Soil	Tier 1 EQS for Soil at a Potable Site (coarse-grained soil, industrial land use)
Surface Water	Tier 1 EQS for Surface Water (freshwater pathway)
	MDMER, Schedule 4 Authorized Limits of Deleterious Substances (Monthly Mean Concentration, Concentration in a Composite Sample, and Concentration in a Grab Sample).

1.6 OBJECTIVES

As stated in the proposal submitted by Stantec dated June 12, 2019, the objective of the Limited Phase II ESA was to assess soil and surface water at the Site with respect to historical tailings and waste rock disposal areas identified in the Phase I ESA completed by Stantec in August 2019. The work was completed as part of project feasibility due diligence underway as part of the potential re-development of the Site.

1.6.1 Scope of Work

The scope of this Phase II ESA, as presented in the proposal submitted by Stantec, consisted of the following:

- Stantec field technicians will travel to the property and meet with applicable Atlantic Gold staff to complete applicable site orientation and site-specific safety training.
- Complete visual site reconnaissance activities at the mine areas of interest to identify additional areas of potential environmental concern (e.g., surface water impacts near tailings, other contaminant sources such as barrel caches, buried debris, etc.) and/or constraints to the planned field program.
- Dig 30 to 40 test pits using hand tools to assess areas of potential tailings, waste rock piles or other features of interest. This sampling method has been recommended due to access restrictions for a wheel/track mounted drill rig or excavator in the areas of interest. It is unlikely that this sampling method will delineate soil impacts at depth, which will be the focus of future field programs to completely satisfy Phase II ESA requirements.
- Collect 5 to 10 surface water samples from the lakes, ponds, and streams on the property.
- Soil will be logged and representative soil samples will be collected from the test pits.
- Soil and surface water samples will be submitted to Bureau Veritas Laboratories (BV Labs), Bedford, NS for metals (all samples).
- Soil samples will be submitted to BV Labs for total petroleum hydrocarbon (TPH) and benzene, toluene, ethylbenzene and xylene (BTEX) analysis (only if potential sources/impacts are observed).

2.0 FIELD INVESTIGATION

2.1 RATIONALE

Test pit locations were chosen in the field based on areas of concern (i.e., tailings and waste rock storage areas) identified during review of the DEM and a visual assessment of the Site, and based on the location of proposed mine infrastructure. Lidar data specific to the Beaver Dam area was requested from the Nova Scotia Department of Natural Resources in August 2019 which identified historical tailing areas within the settlement pond, Crusher Lake and Forge Hill mining and stamp mill area. Surface water sampling locations were chosen based on conditions observed in the field.

Test pit and surface water sampling locations were representative across the proposed mine development area and the proposed open pit; towards the western area surrounding Crusher Lake; and towards the southeast reclaimed areas, settling pond and Cameron Flowage. It should be noted that significant portions of the Site are covered by thick vegetation which prevented a thorough assessment of the ground surface in those areas of the Site during the site visit. Test pit and surface water sampling locations are shown on Figure 2 and Figure 3, respectively in Appendix A.

2.2 METHODOLOGY

Field activities conducted as part of the Limited Phase II ESA were carried out between July 10 and 11, 2019 and consisted of a visual assessment of the Site, the excavation of 29 test pits and associated soil sampling and the collection of surface water samples from four locations.

All samples were collected following strict Stantec sampling procedures. Samples were uniquely labelled and control was maintained through use of chain of custody forms. All samples were collected in laboratory supplied containers and preserved in insulated coolers. Appropriate sampling QA/QC procedures were adhered to at all times.

2.2.1 Soil Sampling

A total of 29 test pits (i.e., SA1 to SA29) were excavated on the site between July 10 and 11, 2019. The test pits were manually excavated using a shovel. Stantec personnel monitored the test pit excavation, maintained detailed logs and photographic records of the subsurface conditions encountered and obtained representative soil samples.

The manually excavated test pits were extended to depths ranging from 0.08 metres below ground surface (mbgs) to 0.45 mbgs, at which point refusal of the hand-held shovel was encountered. Representative bulk soil samples were collected from the various stratigraphic layers encountered in the test pits. One soil sample was collected from each test pit.

The soil samples were examined in the field for evidence of impacts (visual or olfactory), placed in new laboratory-supplied glass jars, placed on ice, and submitted to BV Labs. Based on site observations, the soil samples were submitted for laboratory analysis of available metals. Summaries of soil descriptions are provided in Table B-1 in Appendix B.

2.2.2 Surface Water Sampling

Surface water sampling was conducted during field investigations. Surface water samples were collected at four locations (i.e., SW1 to SW4). One field duplicate sample (i.e., DUP2) was collected from sampling location SW4. The samples were collected into new, laboratory-supplied bottles, placed on ice, and submitted to Bureau Veritas Laboratories in Bedford, NS. Based on site observations, the surface water samples were submitted for laboratory analysis of total metals.

2.3 LABORATORY ANALYSES

Based on field observations, 29 soil samples were submitted to BV Labs, an SCC-Accredited Laboratory for analysis of available metals with one duplicate QA/QC sample taken at SA-16. Four surface water samples (including 1 field duplicate sample) were submitted for analysis of total metals. The laboratory analysis schedule completed as part of this investigation is presented in Table 4 (including laboratory and field duplicate samples).

Table 4 Summary of Laboratory Analysis

Parameter	Sample Media	
	Soil	Surface Water
Metals	29 + 1 Lab-Dup	4 + 1 Fld-Dup

Notes:
The methodologies utilized by Bureau Veritas Laboratories in analysis of the soil and surface water samples are presented on the analytical report in Appendix C.
Lab-Dup = laboratory duplicate QA/QC sample
Fld-Dup = field duplicate QA/QC sample

3.0 RESULTS

3.1 GENERAL OBSERVATIONS

Suspected tailings and waste rock were identified in several areas of the site and were identified near the Austen shaft and within the settling pond area,; adjacent to Crusher Lake, and at Forge Hill at a former mining and stamp mill location during the late 1920s. Lidar data received from NS DNR revealed suspected tailings and waste rock areas identified at these same locations. The waste rock storage areas identified during the current assessment are generally located immediately within the proposed open-pit footprint, south of the Austen Shaft and north of Crusher Lake, placed during site re-grading. Suspected waste rock piles were also observed in the general areas of the former stamp mills located at Crusher Lake and Forge Hill. Information from historical assessment reports indicated that between 1889 and 1989, 44,345 tonnes of tailings mass was produced from Beaver Dam, however material generated in the 1980s (41,000 tonnes) was milled at Gays River, leaving 3,345 tonnes of tailings on-site (Stantec, 2019).

At the time of the site visit, suspected tailings areas were covered with forest or low vegetation. No activity on the site other than various consultants and contractors conducting various due diligence tasks and preparation for a drill program to further delineate the resources was observed. Though waste rock was used to re-grade the site historically by Seabright in 1989, trenching and pits located within the proposed mine footprint exposed rocks for arsenic leaching and potential acid generation. The surface at these locations were generally undisturbed with recent activities.

3.2 SUBSURFACE CONDITIONS

3.2.1 Stratigraphy

The stratigraphy encountered in almost all of the test pits consisted of a layer of organics over poorly graded brown to grey silty sand with some gravel and cobbles. Samples SA-12, SA-14, SA-26, SA-27 and SA-28 consisted of brown-grey silt and suspected tailings with little to no sand and generally thicker overlying organic layers. Potential tailings were generally moist or wet and observed in test pits SA-6, SA-12, SA-13, SA-14, SA-15, SA-26, SA-27 and SA-28. Potential waste rock generated from historical mining activities was identified in test pits SA-1, SA-3, SA-7 and SA-8.

The stratigraphy encountered in test pits SA-12, SA-14, SA-15, SA-17 and SA-18 consisted of a layer of organics overlying a layer of firm, well-graded grey silt which was considered to be potential tailings in SA-12, SA-14 and SA-15. This layer was underlain by poorly graded brown silty sand with some gravel and cobbles.

Detailed descriptions of stratigraphy observed are provided in Table B-1: Test Pit Soil Descriptions, Appendix B.

3.2.2 Groundwater Observations

Groundwater was not encountered in the test pits, which extended to depths ranging from 0.08 mbgs to 0.45 mbgs.

3.2.3 Free Phase Petroleum Hydrocarbons

Free liquid phase petroleum hydrocarbons (i.e., free product) was not observed on soil in the test pits. Petroleum hydrocarbon odour/sheening were also not observed on soil or surface water samples collected during the current investigation.

3.3 ANALYTICAL RESULTS

3.3.1 Soil Analytical Results

Laboratory analysis for available metals was conducted on 29 soil samples collected from the test pits, as well as one laboratory initiated duplicate QA/QC sample of SA 16. Results of the laboratory analysis of soil samples are presented in Table C-1, Appendix C. These results are summarized below:

- Metals parameters with the exception of arsenic were either not detected above the laboratory detection limits or were detected at concentrations that did not exceed the Tier 1 EQS, where such guidelines exist.
- Arsenic concentrations in 25 of the 29 soil samples were found to exceed the Tier 1 EQS of 31 mg/kg. Arsenic concentrations detected in the samples ranged from 6.9 mg/kg (SA-17) to 3,900 mg/kg (SA-28).

3.3.2 Surface Water Analytical Results

Laboratory analysis for total metals was conducted on four surface water samples collected from the Site, as well as one field duplicate QA/QC sample of SW4. Results of the laboratory analysis of surface water samples are presented in Table C-2, Appendix C. These results are summarized below:

- Aluminum and iron were detected in all water samples at concentrations which exceeded the Tier 1 EQS.
- Arsenic was only detected in one surface water sample (SW1) at concentrations which exceeded the Tier 1 EQS of 5 ug/L.

- Cadmium was detected in all water samples, except for SW1, at concentrations which exceeded the Tier 1 EQS.
- Chromium was detected in the duplicate water sample for SW4 at a concentration which exceeded the Tier 1 EQS. All other samples had concentrations at the detection limit and at or below the Tier 1 EQS of 1.0 ug/L.
- All other metals parameters were either not detected above the laboratory detection limits or were detected at concentrations that did not exceed the Tier 1 EQS, where such guidelines exist.
- The detected metals concentrations did not exceed the applicable MDMER Authorized Limits, where such guidelines exist, in the samples analyzed.

3.3.3 Summary of Exceedances

The Limited Phase II ESA identified concentrations of arsenic in soil at the Site exceeding the NSE Tier 1 EQS. The locations of concentrations of arsenic in soil exceeding the applicable guidelines are shown on Figure 2, Appendix A. The distribution of arsenic concentrations in soil in the area of the proposed open pit is also shown on Figure 2, Appendix A.

Concentrations of aluminum, arsenic, cadmium, chromium and iron in surface water at the Site exceeded the NSE Tier 1 EQS. Elevated concentrations of metals parameters such as aluminum and iron are common in Nova Scotia due to surface and underlying geology which contains traces of these metals. The locations of metals concentrations in surface water samples exceeding the applicable NSE Tier 1 EQS are shown on Figure 3, Appendix A.

4.0 CONCLUSIONS

Based on the information gathered and on observations made during this assessment, Stantec provides the following conclusions related to potential environmental contamination associated with historical mining operations within the proposed mine area footprint:

- Possible tailings were visually observed in the stratigraphy of eight of the 29 test pits excavated as part of field activities completed between July 10 to 11, 2019 within the project area. Of the twelve test pits located within or adjacent to the proposed open pit area, four had possible tailings, in the vicinity of the Austen shaft, north of the settling pond. Four of the test pits with possible tailings were located north of Crusher Lake near historical mine workings and stamp mill operations. These locations match the suspected sites observed in Lidar data. Note that visual observation of possible tailings is not necessarily indicative of elevated arsenic concentrations at that location.
- Concentrations of arsenic in soil exceeding the applicable NSE Tier 1 EQS were identified in 25 of the 29 test pit locations. The highest concentrations of arsenic are localized in the area north of the Austen shaft and settlement pond area with the Cameron Flowage located directly east. Concentrations of arsenic exceeding the applicable Tier 1 EQS were also identified in areas where waste rock was used to re-grade the site (historical exploration camps south of the Austen shaft), and areas of historical stamp mills such as Crusher Lake and Forge Hill. Areas containing elevated gold concentrations tend to have elevated concentrations of arsenic due to the presence of arsenopyrite

that is common in the geology of the area. Therefore, elevated arsenic concentrations are expected to be present across the Site.

- Two test pits were also conducted at the bottom of the settling pond near the dam structure (SA-2 and SA-3) and did exceed the Tier 1 EQS for arsenic. Six test pits directly south of the proposed pit and down-gradient of historical operations between Beaver Dam Mine Road and the Killag River also exceeded the Tier 1 EQS.
- Concentrations of arsenic detected in soil samples collected from test pits SA-16, SA-17 and SA-18, which were located outside the footprint of the proposed open pit and not down gradient of the settling pond did not exceed the Tier 1 EQS and are potentially indicative of background soil concentrations.
- Possible waste rock was visually observed at four of the 29 test pit locations. One of these test pits was located adjacent to the Austen shaft and adjacent mine workings (SA-1), one was located adjacent to the dam area of the settlement pond bordering the Killag River (SA-3), and two test pits were located in the identified waste rock near the historical M.E.X pit (i.e., SA-7 and SA-8). Tailings and waste rock appear to be located largely within the project area.
- Concentrations of aluminum and iron exceeding the applicable NSE Tier 1 EQS were identified in all the surface water samples analyzed. Concentrations of chromium only exceeded in a duplicate sample taken at SW4 down gradient in the Killaq River. Cadmium in three of the four samples exceeded the applicable NSE Tier 1 EQS. The detected concentrations of metals did not exceed the applicable MDMER Authorized Limits in any of the samples.
- Concentrations of arsenic in surface water exceeded in only one sample taken near the dam structure within the settling pond (SW1).

5.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

CLOSURE

August 23, 2019

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Jeff Burke, P.Geo, EP., and reviewed by Don Carey, M.Sc., P.Eng., and Eric Arseneau, MES.

Stantec Consulting Ltd.

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APPENDIX A FIGURES

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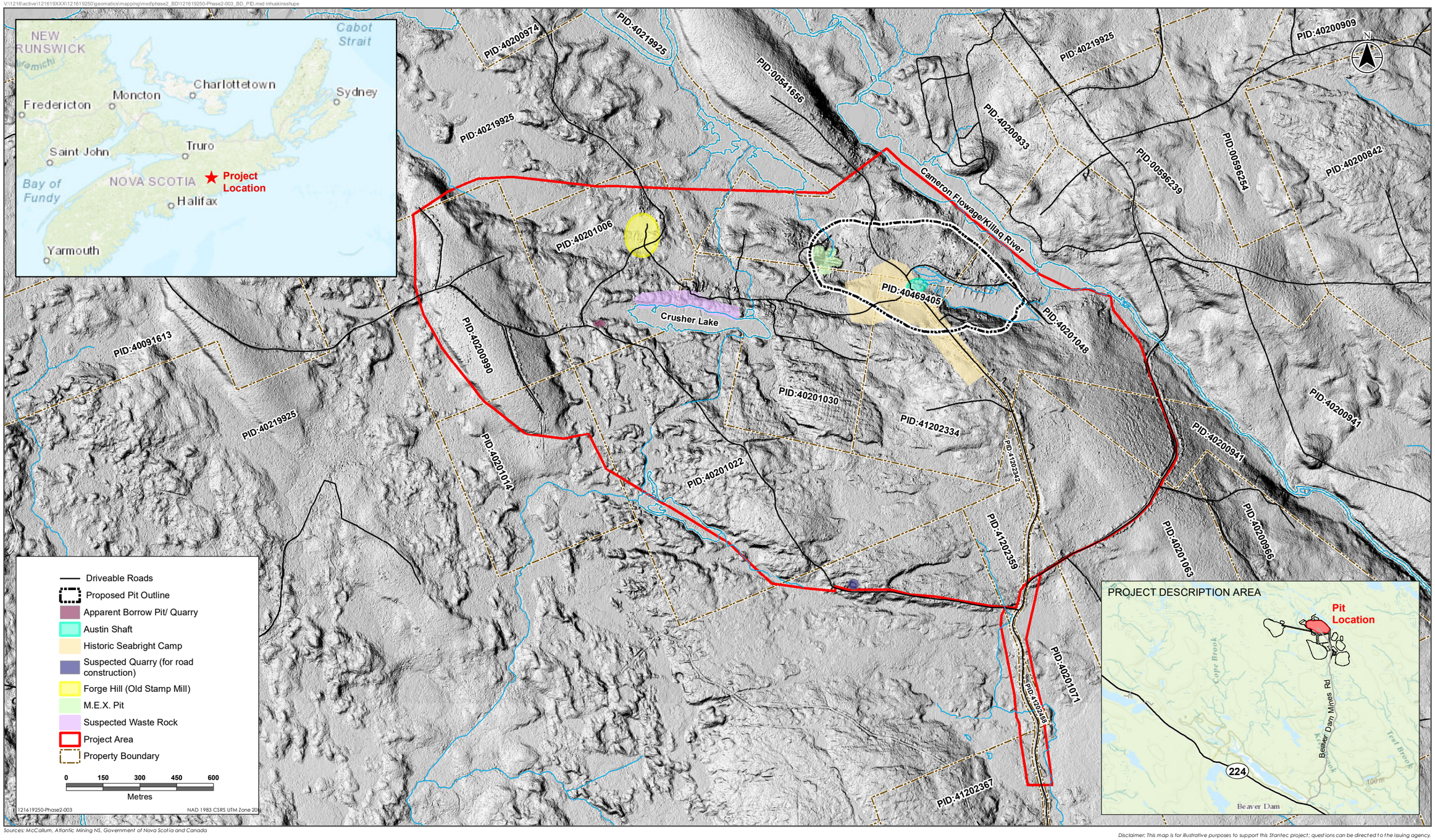

Sources: McCallum, Atlantic Mining NS, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

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ATLANTIC MINING NS

Project Location
Atlantic Mining NS - Beaver Dam Project

Figure 1
Appendix A

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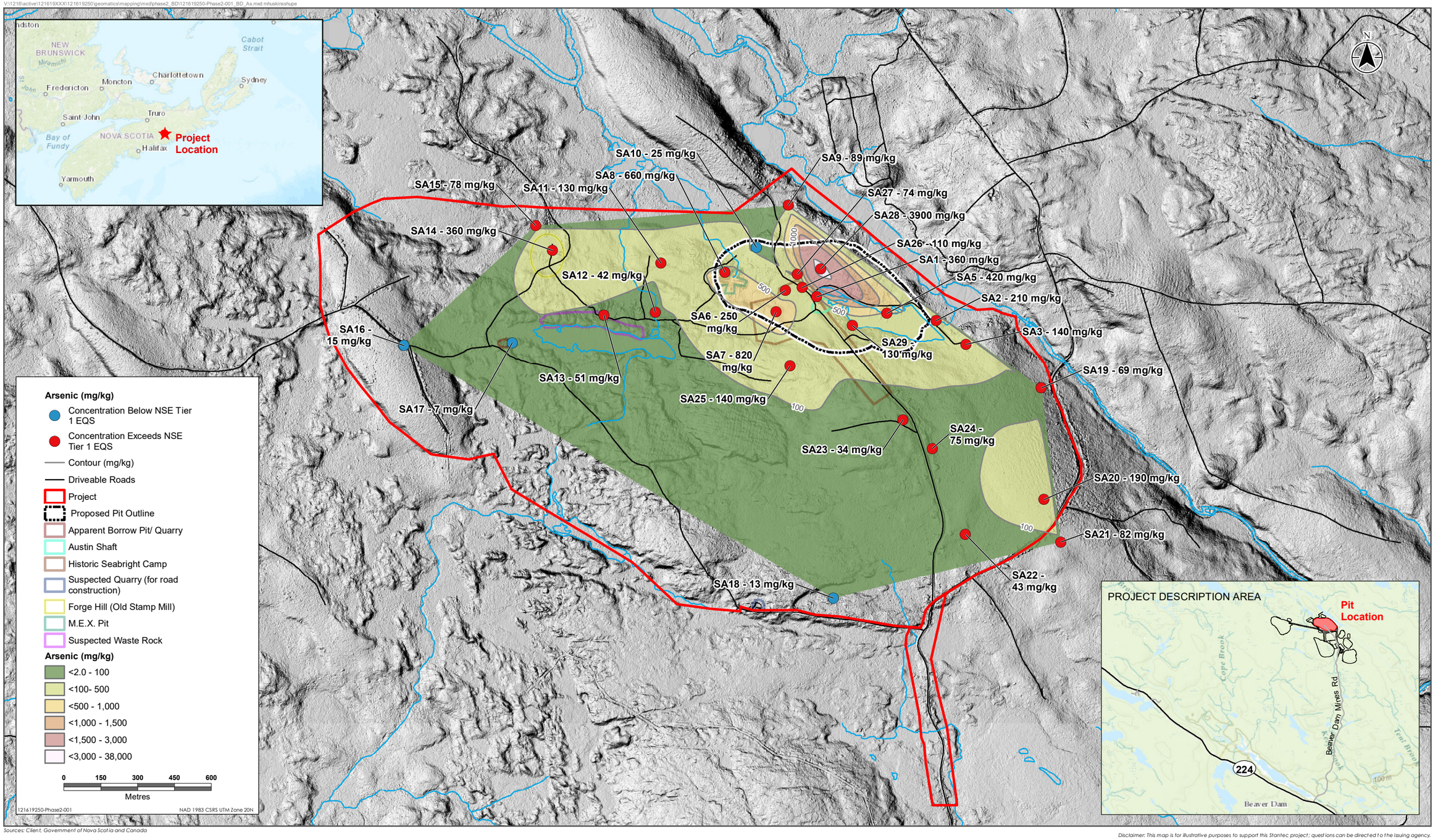

Sources: Client, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Test Pit Locations and Arsenic Concentrations in Soil
Atlantic Mining NS - Beaver Dam Project

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ATLANTIC MINING NS

Figure 2
Appendix A

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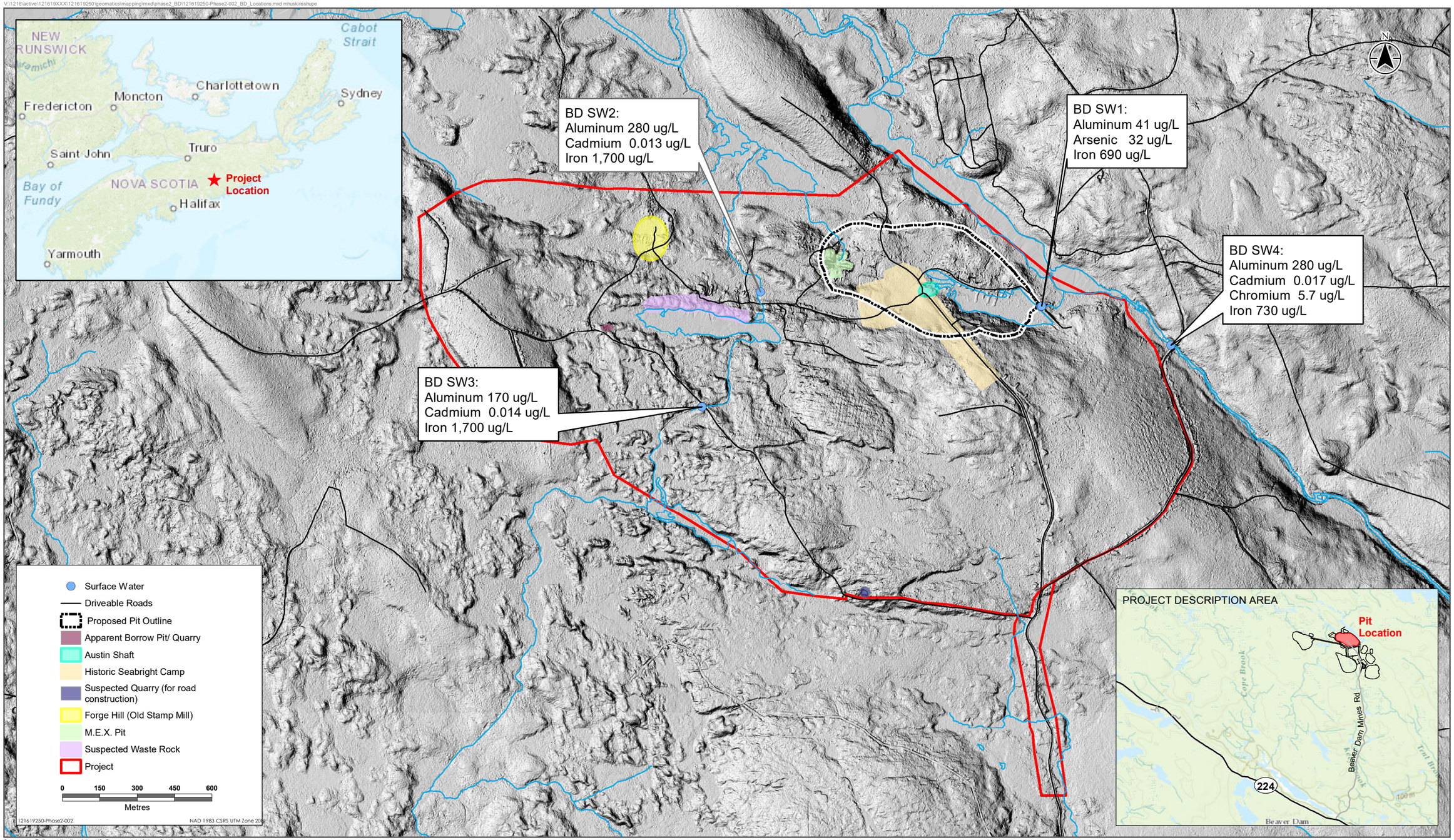

Sources: McCallum, Atlantic Mining NS, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreet Map contributors, and the GIS User Community

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Surface Water Exceeding NS Tier 1 EQS
Atlantic Mining NS - Beaver Dam Project

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Figure 3
Appendix A

APPENDIX B TEST PIT RECORDS

TABLE B-1 Test Pit Soil Descriptions
Atlantic Gold Corporation
Beaver Dam, Halifax, Nova Scotia
Stantec Consulting Ltd, Project No. 121619250.2500.955

Location ID	Date	Test Pit Depth (mbg)	Soil Description
SA-1	10-Jul-19	0-0.25	Poorly graded black to brown silty SAND with cobbles Possible waste rock
SA-2	10-Jul-19		Poorly graded brown silty SAND with cobbles Collected from side of bank
SA-3	10-Jul-19	0-0.30	Firm poorly graded grey to brown silty SAND with gravel and cobbles. Moist Possible waste rock
SA-4	10-Jul-19	0-0.40	Firm poorly graded grey to brown silty SAND with gravel and cobbles. Moist
SA-5	10-Jul-19	0-0.30	Firm poorly graded brown silty SAND with gravel and cobbles. Moist
SA-6	10-Jul-19	0-0.30	Firm silty SAND. Wet Possible tailings
SA-7	10-Jul-19	0-0.30	Firm poorly graded brown to grey silty SAND with gravel and cobbles. Dry Possible waste rock
SA-8	10-Jul-19	0-0.45	Firm poorly graded brown silty SAND with gravel and cobbles. Dry Possible waste rock
SA-9	10-Jul-19	0-0.30	ROOTMAT firm poorly graded brown to grey silty SAND. Dry
SA-10	10-Jul-19	0-0.35	Firm poorly graded brown silty SAND with gravel and cobbles. Dry
SA-11	10-Jul-19	0-0.30	Firm poorly graded brown silty SAND with gravel and cobbles. Dry
SA-12	10-Jul-19	0-0.25	Black ORGANICS
		0.25-0.40	Grey SILT Possible tailings
SA-13	10-Jul-19	0-0.25	Firm grey silty SAND Trace gravel. Moist Possible tailings
SA-14	11-Jul-19	0-0.25	Black ORGANICS
		0.25-0.40	Firm sandy SILT with grass roots. Moist Possible tailings
SA-15	11-Jul-19	0-0.30	Black ORGANICS with firm grey sandy silt Moist Possible tailings
SA-16	11-Jul-19		Firm poorly graded grey silty SAND with gravel and cobbles. Moist
SA-17	11-Jul-19	0-0.08	Black ORGANICS
		0.08-0.30	Firm poorly graded reddish brown silty SAND with gravel. Dry
SA-18	11-Jul-19	0-0.35	Firm poorly graded brown silty SAND with gravel. Dry
SA-19	11-Jul-19	0-0.25	Black ORGANICS - MOSS
		0.25-0.40	Frim poorly graded grey silty SAND with cobbles. Wet

TABLE B-1 Test Pit Soil Descriptions
Atlantic Gold Corporation
Beaver Dam, Halifax, Nova Scotia
Stantec Consulting Ltd, Project No. 121619250.2500.955

Location ID	Date	Test Pit Depth (mbg)	Soil Description
SA-20	11-Jul-19	0-0.30	Firm poorly graded brown silty SAND with gravel and cobbles. Dry
SA-21	11-Jul-19	0-0.30	Firm poorly graded brown to grey silty SAND with gravel. Dry
SA-22	11-Jul-19	0-0.40	Firm poorly graded brown silty SAND with gravel. Moist
SA-23	11-Jul-19	0-0.35	Firm poorly graded brown silty SAND with gravel. Dry
SA-24	11-Jul-19	0-0.30	Firm brown silty SAND with gravel. Dry
SA-25	11-Jul-19	0-0.35	Firm brown silty SAND with gravel. Dry
SA-26	11-Jul-19	0-0.35	Firm brown to grey SILT Moist Possible tailings
SA-27	11-Jul-19	0-0.40	Firm brown SILT Moist Possible tailings
SA-28	11-Jul-19	0-0.15	Firm grey SILT Wet Possible tailings
SA-29	11-Jul-19	0-0.20	Firm poorly graded brown silty SAND with gravel and cobbles. Wet

TEST PIT: SA1

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Poorly graded balck to brown silty SAND with cobbles - possible waste rock	0.00	1	SA
0.5	0.2					
			End of TEST PIT	0.25		
1.0	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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TEST PIT: SA2

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Poorly graded brown silty SAND with cobbles - sample collected from side of bank	0.00		
0.5					2	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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TEST PIT: SA3

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded grey to brown silty SAND with gravel and cobbles - moist - possible waste rock	0.00		
0.5					3	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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TEST PIT: SA4

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded grey to borwn silty SAND with gravel and cobbles - moist - possible waste rock	0.00		
0.5						
	0.2				4	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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TEST PIT: SA5

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - moist	0.00		
0.5					5	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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TEST PIT: SA6

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm silty SAND - wet - possible tailings	0.00	6	SA
0.5	0.2					
1.0	0.4		End of TEST PIT	0.30		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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TEST PIT: SA7

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown to grey silty SAND with gravel and cobbles - dry - possible waste rock	0.00		
0.5					7	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA8

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry - possible waste rock	0.00		
0.5						
	0.2				8	SA
1.0						
	0.4					
1.5			End of TEST PIT	0.45		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

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STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA9

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			ROOTMAT firm poorly graded brown to grey silty SAND - dry	0.00		
0.5					9	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA10

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry	0.00	10	SA
0.5	0.2					
1.0						
	0.4		End of TEST PIT	0.35		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA11

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry	0.00		
0.5					11	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA12

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS	0.00	SA12 A	SA
0.5						
	0.2					
			Grey SILT - possible tailings	0.25	SA12 B	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA13

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	10-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm grey silty SAND - trace gravel - moist - possible tailings	0.00	13	SA
0.5	0.2					
			End of TEST PIT	0.25		
1.0	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA14

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS	0.00	14 A	SA
0.5						
	0.2					
			Firm sandy SILT with grass roots - moist - possible tailings	0.25	14 B	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA15

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS with firm grey sandy silt - moist - possible tailings	0.00		
0.5					15	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA16

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded grey silty SAND with gravel and cobbles - moist	0.00		
0.5					16	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA17

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS	0.00	SA17 A	SA
			Firm poorly graded reddish borwn silty SAND with gravel - dry	0.08	SA17 B	SA
0.5	0.2					
1.0	0.4		End of TEST PIT	0.30		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA18

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel - dry	0.00		
0.5					18	SA
	0.2					
1.0						
	0.4					
1.5						
			End of TEST PIT	0.35		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA19

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Black ORGANICS - MOSS	0.00		
					SA19 A	SA
0.5						
	0.2					
			Firm poorly graded grey silty SAND with cobbles - wet	0.25		
1.0					SA19 B	SA
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA20

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - dry	0.00		
0.5					20	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA21

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown to grey silty SAND with gravel - dry	0.00		
0.5					21	SA
	0.2					
1.0			End of TEST PIT	0.30		
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA22

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poosrly graded brown silty SAND with gravel - moist	0.00		
0.5						
	0.2				22	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA23

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel - dry	0.00		
0.5					23	SA
	0.2					
1.0						
	0.4					
1.5						
			End of TEST PIT	0.35		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA24

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown silty SAND with gravel - dry	0.00	24	SA
0.5						
	0.2		End of TEST PIT	0.20		
1.0						
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA25

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown silty SAND with gravel - dry	0.00		
0.5					25	SA
	0.2					
1.0						
	0.4					
1.5						
			End of TEST PIT	0.35		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA26

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown to grey SILT - moist - possible tailings	0.00		
0.5					25	SA
	0.2					
1.0						
	0.4					
1.5						
			End of TEST PIT	0.35		

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA27

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm brown SILT - moist - possible tailings	0.00		
0.5						
	0.2				27	SA
1.0						
	0.4		End of TEST PIT	0.40		
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA28

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm grey SILT - moist - possible tailings	0.00	28	SA
0.5			End of TEST PIT	0.15		
	0.2					
1.0						
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

TEST PIT: SA29

Project:	PHASE II	**Drilling method:**	HAND DUG
Client:	ATLANTIC GOLD CORPORATION	**Date started/completed:**	11-Jul-2019
Location:	BEAVER DAM, HALIFAX, NOVA SOCTIA	**Ground surface elevation:**	n/a
Number:	121619250.2500.955	**Top of casing elevation:**	n/a
Field investigator:	M. PARKER	**Easting:**	n/a
Contractor:	STANTEC CONSULTING	**Northing:**	n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
			Ground Surface			
			Firm poorly graded brown silty SAND with gravel and cobbles - wet	0.00	29	SA
0.5						
	0.2		End of TEST PIT	0.20		
1.0						
	0.4					
1.5						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
n/a - not available

Stantec

Drawn By/Checked By: J. BURKE

STANTEC BOREHOLE AND WELL V2 121619250.2500.955_BEAVER_DAM_JUL2019.GPJ STANTEC - DATA TEMPLATE.GDT 8/16/19 GWHALEN

APPENDIX C SOIL AND SURFACE WATER ANALYTICAL SUMMARY TABLES & LABORATORY CERTIFICATES OF ANALYSIS

TABLE C-1

SOIL CHEMISTRY - METALS
Atlantic Mining NS Corporation
Beaver Dam, Halifax County, Nova Scotia
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	SA1	SA2	SA3	SA4	SA5	SA6	SA7	SA8	SA9	SA10	SA11
			Sample Depth (mbgs):	0-0.25		0-0.30	0-0.40	0-0.30	0-0.30	0-0.30	0-0.45	0-0.30	0-0.35	0-0.30
			Date Sampled:	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19	10-Jul-19
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	24000	27000	14000	18000	23000	15000	23000	31000	11000	30000	37000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Arsenic (As)	mg/kg	2.0	31	360	210	140	160	420	250	820	660	89	25	130
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	43	30	39	34	46	56	51	37	17	28	30
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Bismuth (Bi)	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
Acid Extractable Boron (B)	mg/kg	50	24,000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	35	31	22	25	31	28	44	47	18	30	43
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	8.5	9.6	11	7.7	14	9.7	11	9.6	1.8	5.8	7.9
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	40	26	22	7.0	33	35	39	42	4.1	14	27
Acid Extractable Iron (Fe)	mg/kg	50	144,000	55000	36000	26000	26000	32000	33000	43000	45000	30000	38000	45000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	27	15	9.6	10	16	15	110	12	17	15	13
Acid Extractable Lithium (Li)	mg/kg	2.0	-	36	35	32	29	37	36	34	32	7.1	31	34
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	530	370	410	510	560	530	460	400	120	310	330
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	0.11	0.13	<0.10	0.12	0.12	<0.10	<0.10	0.11	0.16	0.14	0.23
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	17	<2.0	<2.0	<2.0
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	16	21	20	14	25	24	24	21	5.1	14	21
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	33	14	16	12	18	20	21	17	3.3	12	12
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	1.1	1.7	2.2
Acid Extractable Silver (Ag)	mg/kg	0.5	490	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	5.8	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	<5.0	<5.0	5.7	8.0	5.9	10	5.8	<5.0	<5.0	6.7	<5.0
Acid Extractable Thallium (Tl)	mg/kg	0.10	1.0	0.27	0.15	0.15	<0.10	0.18	0.15	0.24	0.19	<0.10	0.14	0.16
Acid Extractable Tin (Sn)	mg/kg	2.0	122,000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	0.89	0.92	0.84	0.71	0.93	1.3	0.85	0.78	0.43	0.90	0.89
Acid Extractable Vanadium (V)	mg/kg	2.0	160	36	37	24	37	35	25	31	43	58	38	46
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	88	56	46	48	64	59	78	73	28	44	74

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Potable site; coarse-grained soil, industrial land use. From Nova Scotias Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A.
2. RDL = laboratory's reportable detection limit
3. <# = parameter not detected above RDL shown
4. mbgs = metres below ground surface
5. ' -' = no standard available; n/a = not applicable
6. Lab-Dup = laboratory QA/QC duplicate; DUP1 = blind field QA/QC duplicate

7 = Exceeds NSE Tier 1 Environmental Quality Standards for Soil at a Potable site coarse-grained soil, industrial land use. From Nova Scotias Contaminated

TABLE C-1

SOIL CHEMISTRY - METALS
Atlantic Mining NS Corporation
Beaver Dam, Halifax County, Nova Scotia
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	SA12	SA13	SA14	SA15	SA16			SA17	SA18	SA19
			Sample Depth (mbgs):	0-0.40	0-0.25	0-0.40	0-0.30		DUP1	Lab-Dup	0-0.30	0-0.35	0-0.40
			Date Sampled:	10-Jul-19	10-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	4600	22000	22000	20000	21000	20000	19000	47000	33000	13000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Arsenic (As)	mg/kg	2.0	31	42	51	360	78	15	14	13	6.9	13	69
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	6.3	69	78	110	57	44	43	28	31	21
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Bismuth (Bi)	mg/kg	2.0	-	<2.0	<2.0	2.9	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Boron (B)	mg/kg	50	24,000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	7.1	33	33	45	25	23	23	42	37	16
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	<1.0	27	4.3	14	12	11	10	4.0	8.1	4.8
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	7.4	65	16	38	22	16	16	6.7	20	4.2
Acid Extractable Iron (Fe)	mg/kg	50	144,000	7200	37000	41000	35000	32000	30000	29000	47000	41000	19000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	8.2	12	58	7.2	17	16	15	13	14	9.3
Acid Extractable Lithium (Li)	mg/kg	2.0	-	6.1	45	48	44	36	32	30	26	41	23
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	97	520	410	480	740	640	610	150	310	260
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	7.3	0.14	15	0.14	0.13	<0.10	<0.10	0.29	0.12	0.11
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<2.0	<2.0	<2.0	3.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	<2.0	38	8.2	29	23	18	18	10	20	9.8
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	3.9	36	59	48	18	16	16	9.4	16	9.0
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4	1.5	<1.0
Acid Extractable Silver (Ag)	mg/kg	0.5	490	<0.50	<0.50	<0.50	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	<5.0	8.2	<5.0	11	10	8.7	9.1	<5.0	<5.0	5.4
Acid Extractable Thallium (Tl)	mg/kg	0.10	1.0	<0.10	0.37	0.45	0.30	0.16	0.16	0.14	0.11	0.17	0.12
Acid Extractable Tin (Sn)	mg/kg	2.0	122,000	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.7	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	0.14	2.3	0.38	0.87	1.2	1.0	1.0	0.90	1.1	0.54
Acid Extractable Vanadium (V)	mg/kg	2.0	160	8.1	40	39	43	27	27	25	83	43	24
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	15	100	69	65	57	50	48	32	51	33

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Potable site; coarse-grained soil, industrial land use. From Nova Scotias Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A.
2. RDL = laboratory's reportable detection limit
3. <# = parameter not detected above RDL shown
4. mbgs = metres below ground surface
5. ' -' = no standard available; n/a = not applicable
6. Lab-Dup = laboratory QA/QC duplicate; DUP1 = blind field QA/QC duplicate

7 = Exceeds NSE Tier 1 Environmental Quality Standards for Soil at a Potable site coarse-grained soil, industrial land use. From Nova Scotias Contaminated

TABLE C-1

SOIL CHEMISTRY - METALS
Atlantic Mining NS Corporation
Beaver Dam, Halifax County, Nova Scotia
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	SA20		SA21	SA22	SA23	SA24	SA25	SA26	SA27	SA28	SA29
			Sample Depth (mbgs):	0-0.30	Lab-Dup	0-0.30	0-0.40	0-0.35	0-0.30	0-0.35	0-0.35	0-0.40	0-0.15	0-0.20
			Date Sampled:	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	12-Jul-19	12-Jul-19	12-Jul-19	12-Jul-19
Acid Extractable Aluminum (Al)	mg/kg	10	198,000	21000	21000	7800	25000	28000	21000	25000	16000	16000	18000	16000
Acid Extractable Antimony (Sb)	mg/kg	2.0	63	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Arsenic (As)	mg/kg	2.0	31	190	190	82	43	34	75	140	110	74	3900	130
Acid Extractable Barium (Ba)	mg/kg	5.0	140,000	32	33	11	29	30	21	33	36	34	42	41
Acid Extractable Beryllium (Be)	mg/kg	2.0	320	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Acid Extractable Bismuth (Bi)	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
Acid Extractable Boron (B)	mg/kg	50	24,000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Acid Extractable Cadmium (Cd)	mg/kg	0.30	192	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Acid Extractable Chromium (Cr)	mg/kg	2.0	2,300	26	26	8.8	25	31	23	27	21	19	66	24
Acid Extractable Cobalt (Co)	mg/kg	1.0	250	6.1	6.2	<1.0	4.3	7.4	3.2	5.6	7.1	4.5	18	7.8
Acid Extractable Copper (Cu)	mg/kg	2.0	16,000	9.2	9.3	2.8	7.9	11	7.1	17	11	9.0	91	31
Acid Extractable Iron (Fe)	mg/kg	50	144,000	32000	32000	21000	29000	36000	31000	38000	27000	23000	40000	26000
Acid Extractable Lead (Pb)	mg/kg	0.50	740	11	11	9.7	13	15	14	14	19	15	34	19
Acid Extractable Lithium (Li)	mg/kg	2.0	-	27	28	3.9	23	33	18	29	26	21	69	36
Acid Extractable Manganese (Mn)	mg/kg	2.0	-	310	310	86	200	510	160	310	360	270	660	440
Acid Extractable Mercury (Hg)	mg/kg	0.10	99	0.13	0.12	0.15	0.20	0.18	0.19	0.18	<0.10	0.14	<0.10	<0.10
Acid Extractable Molybdenum (Mo)	mg/kg	2.0	1,200	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.9	<2.0
Acid Extractable Nickel (Ni)	mg/kg	2.0	2,200	15	15	3.1	11	16	8.6	16	14	11	38	23
Acid Extractable Rubidium (Rb)	mg/kg	2.0	-	12	12	6.9	9.9	11	7.2	9.1	12	10	16	16
Acid Extractable Selenium (Se)	mg/kg	1.0	1,135	1.3	1.3	<1.0	1.9	1.5	1.4	1.6	<1.0	<1.0	<1.0	<1.0
Acid Extractable Silver (Ag)	mg/kg	0.5	490	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	27	<0.50
Acid Extractable Strontium (Sr)	mg/kg	5.0	122,000	5.6	5.8	<5.0	5.4	<5.0	<5.0	8.1	7.3	6.9	27	9.2
Acid Extractable Thallium (Tl)	mg/kg	0.10	1.0	0.12	0.14	0.13	0.14	0.17	0.13	0.14	0.12	0.11	0.24	0.19
Acid Extractable Tin (Sn)	mg/kg	2.0	122,000	<1.0	<1.0	1.0	<1.0	1.1	1.2	<1.0	<1.0	<1.0	<1.0	<1.0
Acid Extractable Uranium (U)	mg/kg	0.10	300	0.75	0.78	0.45	0.83	0.68	0.58	0.68	0.68	0.61	0.94	0.90
Acid Extractable Vanadium (V)	mg/kg	2.0	160	35	35	32	38	49	45	31	30	29	33	28
Acid Extractable Zinc (Zn)	mg/kg	5.0	47,000	43	43	11	32	50	26	52	45	35	79	60

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Soil at a Potable site; coarse-grained soil, industrial land use. From Nova Scotias Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 1A.
2. RDL = laboratory's reportable detection limit
3. <# = parameter not detected above RDL shown
4. mbgs = metres below ground surface
5. ' -' = no standard available; n/a = not applicable
6. Lab-Dup = laboratory QA/QC duplicate; DUP1 = blind field QA/QC duplicate
7. 38 = Exceeds NSE Tier 1 EQS

TABLE C-2 SURFACE WATER CHEMISTRY- METALS
Atlantic Mining NS Corporation
Beaver Dam, Halifax County, Nova Scotia
Stantec Consulting Ltd. Project No. 121619250

Parameter	Units	RDL	Tier 1 EQS [1]	MDMER [2]			SW1	SW2	SW3	SW4	
				Monthly Mean	Composite Sample	Grab Sample					
						Date Sampled:	10-Jul-19	10-Jul-19	11-Jul-19	11-Jul-19	DUP2
Total Aluminum (Al)	ug/L	5.0	5.0	-	-	-	41	280	170	280	280
Total Antimony (Sb)	ug/L	1.0	20	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Total Arsenic (As)	ug/L	1.0	5.0	500	750	1,000	32	4.3	<1.0	4.6	4.7
Total Barium (Ba)	ug/L	1.0	1,000	-	-	-	3.7	2.4	5.5	3.0	3.0
Total Beryllium (Be)	ug/L	1.0	5.3	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Total Bismuth (Bi)	ug/L	2.0	-	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Total Boron (B)	ug/L	50	1,200	-	-	-	<50	<50	<50	<50	<50
Total Cadmium (Cd)	ug/L	0.01	0.01	-	-	-	<0.010	0.013	0.014	0.013	0.017
Total Calcium (Ca)	ug/L	100	-	-	-	-	3600	580	1100	670	710
Total Chromium (Cr)	ug/L	1.0	1.0	-	-	-	<1.0	1.0	1.0	1.0	5.7
Total Cobalt (Co)	ug/L	0.40	10	-	-	-	<0.40	<0.40	0.74	<0.40	<0.40
Total Copper (Cu)	ug/L	2.0	2.0	300	450	600	1.4	0.51	<0.50	<0.50	0.59
Total Iron (Fe)	ug/L	50	300	-	-	-	690	750	1700	660	730
Total Lead (Pb)	ug/L	0.50	1.0	200	300	400	<0.50	<0.50	<0.50	<0.50	<0.50
Total Magnesium (Mg)	ug/L	100	-	-	-	-	650	270	430	300	310
Total Manganese (Mn)	ug/L	2.0	820	-	-	-	67	43	69	43	46
Total Mercury (Hg)	ug/L	0.013	0.026	-	-	-	<0.0020	<0.0020	0.0027	<0.0020	<0.0020
Total Molybdenum (Mo)	ug/L	2.0	73	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Total Nickel (Ni)	ug/L	2.0	25	500	750	1,000	<2.0	<2.0	<2.0	<2.0	2.2
Total Phosphorus (P)	ug/L	100	-	-	-	-	<100	<100	<100	<100	<100
Total Potassium (K)	ug/L	100	-	-	-	-	530	130	380	100	<100
Total Selenium (Se)	ug/L	1.0	1.0	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Total Silver (Ag)	ug/L	0.10	0.1	-	-	-	<0.10	<0.10	<0.10	<0.10	<0.10
Total Sodium (Na)	ug/L	100	-	-	-	-	1800	1900	2500	1900	2000
Total Strontium (Sr)	ug/L	2.0	21,000	-	-	-	18	4.2	8.4	5.8	6.4
Total Thallium (Tl)	ug/L	0.10	0.80	-	-	-	<0.10	<0.10	<0.10	<0.10	<0.10
Total Tin (Sn)	ug/L	2.0	-	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Total Titanium (Ti)	ug/L	2.0	-	-	-	-	<2.0	2.4	2.0	3.3	2.6
Total Uranium (U)	ug/L	0.10	300	-	-	-	<0.10	<0.10	<0.10	<0.10	<0.10
Total Vanadium (V)	ug/L	2.0	6.0	-	-	-	<2.0	<2.0	<2.0	<2.0	<2.0
Total Zinc (Zn)	ug/L	5.0	30	500	750	1,000	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:

1. Tier 1 EQS = Tier 1 Environmental Quality Standards for Surface Water; fresh water pathway.
   From Nova Scotias Contaminated Sites Regulations (July 6, 2013) Notification of Contamination Protocol; Table 3.
2. MDMER = Metal and Diamond Mining Effluent Regulations SOR/2002-222, Schedule 4 Authorized Limits of Deleterious Substances, Column 4 Maximum Authorized Concentration in a Grab Sample. Current to June 20, 2018.
   RDL = laboratory's reportable detection limit
3. <# = parameter not detected above RDL shown
4. -' = no standard available; n/a = not applicable
5. DUP2 = blind field QA/QC duplicate
6. = Exceeds NSE Tier 1 EQS for Freshwater

Your Project #: 121619250.2500.955
Site Location: BEAVER DAM
Your C.O.C. #: D33529, D40448, D40591, D40449

Attention: Patrick Turner

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Report Date: 2019/07/23
Report #: R5809183
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9J4560
Received: 2019/07/15, 14:13

Sample Matrix: Soil
Samples Received: 30

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Solids Acid Extr. ICPMS	30	2019/07/22	2019/07/23	ATL SOP 00058	EPA 6020B R2 m

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals Water Total MS	5	2019/07/17	2019/07/17	ATL SOP 00058	EPA 6020B R2 m
Mercury (Total) by CV (1)	5	2019/07/19	2019/07/19	BBY7SOP-00015	BCMOE BCLM Oct2013 m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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.

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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 BV Labs, results relate to the supplied samples tested.
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Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bedford to Burnaby - Offsite

Your Project #: 121619250.2500.955
Site Location: BEAVER DAM
Your C.O.C. #: D33529, D40448, D40591, D40449

Attention: Patrick Turner

Stantec Consulting Ltd
40 Highfield Park Drive
Suite 102
Dartmouth, NS
CANADA B3A 0A3

Report Date: 2019/07/23
Report #: R5809183
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9J4560
Received: 2019/07/15, 14:13

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas Laboratories
23 Jul 2019 14:07:06

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

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		KGT667	KGT668	KGT669	KGT670	KGT671	KGT672		
Sampling Date		2019/07/10	2019/07/10	2019/07/10	2019/07/10	2019/07/10	2019/07/10		
COC Number		D33529	D33529	D33529	D33529	D33529	D33529		
	UNITS	**SA1**	**SA2**	**SA3**	**SA4**	**SA5**	**SA6**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	24000	27000	14000	18000	23000	15000	10	6240247
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Arsenic (As)	mg/kg	360	210	140	160	420	250	2.0	6240247
Acid Extractable Barium (Ba)	mg/kg	43	30	39	34	46	56	5.0	6240247
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	50	6240247
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6240247
Acid Extractable Chromium (Cr)	mg/kg	35	31	22	25	31	28	2.0	6240247
Acid Extractable Cobalt (Co)	mg/kg	8.5	9.6	11	7.7	14	9.7	1.0	6240247
Acid Extractable Copper (Cu)	mg/kg	40	26	22	7.0	33	35	2.0	6240247
Acid Extractable Iron (Fe)	mg/kg	55000	36000	26000	26000	32000	33000	50	6240247
Acid Extractable Lead (Pb)	mg/kg	27	15	9.6	10	16	15	0.50	6240247
Acid Extractable Lithium (Li)	mg/kg	36	35	32	29	37	36	2.0	6240247
Acid Extractable Manganese (Mn)	mg/kg	530	370	410	510	560	530	2.0	6240247
Acid Extractable Mercury (Hg)	mg/kg	0.11	0.13	<0.10	0.12	0.12	<0.10	0.10	6240247
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	2.0	6240247
Acid Extractable Nickel (Ni)	mg/kg	16	21	20	14	25	24	2.0	6240247
Acid Extractable Rubidium (Rb)	mg/kg	33	14	16	12	18	20	2.0	6240247
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6240247
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	0.50	6240247
Acid Extractable Strontium (Sr)	mg/kg	<5.0	<5.0	5.7	8.0	5.9	10	5.0	6240247
Acid Extractable Thallium (Tl)	mg/kg	0.27	0.15	0.15	<0.10	0.18	0.15	0.10	6240247
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6240247
Acid Extractable Uranium (U)	mg/kg	0.89	0.92	0.84	0.71	0.93	1.3	0.10	6240247
Acid Extractable Vanadium (V)	mg/kg	36	37	24	37	35	25	2.0	6240247
Acid Extractable Zinc (Zn)	mg/kg	88	56	46	48	64	59	5.0	6240247

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		KGT673	KGT674		KGT675	KGT676	KGT678	KGT679		
Sampling Date		2019/07/10	2019/07/10		2019/07/10	2019/07/10	2019/07/10	2019/07/10		
COC Number		D33529	D33529		D33529	D33529	D40448	D40448		
	UNITS	**SA7**	**SA8**	**RDL**	**SA9**	**SA10**	**SA11**	**SA12**	**RDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	23000	31000	10	11000	30000	37000	4600	10	6240247
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Arsenic (As)	mg/kg	820	660	20	89	25	130	42	2.0	6240247
Acid Extractable Barium (Ba)	mg/kg	51	37	5.0	17	28	30	6.3	5.0	6240247
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Boron (B)	mg/kg	<50	<50	50	<50	<50	<50	<50	50	6240247
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	0.30	<0.30	<0.30	<0.30	<0.30	0.30	6240247
Acid Extractable Chromium (Cr)	mg/kg	44	47	2.0	18	30	43	7.1	2.0	6240247
Acid Extractable Cobalt (Co)	mg/kg	11	9.6	1.0	1.8	5.8	7.9	<1.0	1.0	6240247
Acid Extractable Copper (Cu)	mg/kg	39	42	2.0	4.1	14	27	7.4	2.0	6240247
Acid Extractable Iron (Fe)	mg/kg	43000	45000	50	30000	38000	45000	7200	50	6240247
Acid Extractable Lead (Pb)	mg/kg	110	12	0.50	17	15	13	8.2	0.50	6240247
Acid Extractable Lithium (Li)	mg/kg	34	32	2.0	7.1	31	34	6.1	2.0	6240247
Acid Extractable Manganese (Mn)	mg/kg	460	400	2.0	120	310	330	97	2.0	6240247
Acid Extractable Mercury (Hg)	mg/kg	<0.10	0.11	0.10	0.16	0.14	0.23	7.3	0.10	6240247
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	17	2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Nickel (Ni)	mg/kg	24	21	2.0	5.1	14	21	<2.0	2.0	6240247
Acid Extractable Rubidium (Rb)	mg/kg	21	17	2.0	3.3	12	12	3.9	2.0	6240247
Acid Extractable Selenium (Se)	mg/kg	<1.0	1.4	1.0	1.1	1.7	2.2	<1.0	1.0	6240247
Acid Extractable Silver (Ag)	mg/kg	<0.50	5.8	0.50	<0.50	<0.50	<0.50	<0.50	0.50	6240247
Acid Extractable Strontium (Sr)	mg/kg	5.8	<5.0	5.0	<5.0	6.7	<5.0	<5.0	5.0	6240247
Acid Extractable Thallium (Tl)	mg/kg	0.24	0.19	0.10	<0.10	0.14	0.16	<0.10	0.10	6240247
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	1.0	1.4	<1.0	<1.0	<1.0	1.0	6240247
Acid Extractable Uranium (U)	mg/kg	0.85	0.78	0.10	0.43	0.90	0.89	0.14	0.10	6240247
Acid Extractable Vanadium (V)	mg/kg	31	43	2.0	58	38	46	8.1	2.0	6240247
Acid Extractable Zinc (Zn)	mg/kg	78	73	5.0	28	44	74	15	5.0	6240247

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		KGT680	KGT681	KGT682	KGT683	KGT684	KGT685		
Sampling Date		2019/07/10	2019/07/11	2019/07/11	2019/07/11	2019/07/11	2019/07/11		
COC Number		D40448	D40448	D40448	D40448	D40448	D40448		
	UNITS	**SA13**	**SA14**	**SA15**	**SA16**	**SA17**	**SA18**	**RDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	22000	22000	20000	21000	47000	33000	10	6240247
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Arsenic (As)	mg/kg	51	360	78	15	6.9	13	2.0	6240247
Acid Extractable Barium (Ba)	mg/kg	69	78	110	57	28	31	5.0	6240247
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	2.9	<2.0	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	50	6240247
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6240247
Acid Extractable Chromium (Cr)	mg/kg	33	33	45	25	42	37	2.0	6240247
Acid Extractable Cobalt (Co)	mg/kg	27	4.3	14	12	4.0	8.1	1.0	6240247
Acid Extractable Copper (Cu)	mg/kg	65	16	38	22	6.7	20	2.0	6240247
Acid Extractable Iron (Fe)	mg/kg	37000	41000	35000	32000	47000	41000	50	6240247
Acid Extractable Lead (Pb)	mg/kg	12	58	7.2	17	13	14	0.50	6240247
Acid Extractable Lithium (Li)	mg/kg	45	48	44	36	26	41	2.0	6240247
Acid Extractable Manganese (Mn)	mg/kg	520	410	480	740	150	310	2.0	6240247
Acid Extractable Mercury (Hg)	mg/kg	0.14	15	0.14	0.13	0.29	0.12	0.10	6240247
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	3.7	<2.0	<2.0	<2.0	2.0	6240247
Acid Extractable Nickel (Ni)	mg/kg	38	8.2	29	23	10	20	2.0	6240247
Acid Extractable Rubidium (Rb)	mg/kg	36	59	48	18	9.4	16	2.0	6240247
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	2.4	1.5	1.0	6240247
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	3.9	<0.50	<0.50	<0.50	0.50	6240247
Acid Extractable Strontium (Sr)	mg/kg	8.2	<5.0	11	10	<5.0	<5.0	5.0	6240247
Acid Extractable Thallium (Tl)	mg/kg	0.37	0.45	0.30	0.16	0.11	0.17	0.10	6240247
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	1.0	<1.0	1.7	<1.0	1.0	6240247
Acid Extractable Uranium (U)	mg/kg	2.3	0.38	0.87	1.2	0.90	1.1	0.10	6240247
Acid Extractable Vanadium (V)	mg/kg	40	39	43	27	83	43	2.0	6240247
Acid Extractable Zinc (Zn)	mg/kg	100	69	65	57	32	51	5.0	6240247

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		KGT686	KGT687	KGT687		KGT692	KGT693	KGT694		
Sampling Date		2019/07/11	2019/07/11	2019/07/11		2019/07/11	2019/07/11	2019/07/11		
COC Number		D40448	D40448	D40448		D40591	D40591	D40591		
	UNITS	**SA19**	**SA20**	**SA20 Lab-Dup**	**QC Batch**	**SA21**	**SA22**	**SA23**	**RDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	13000	21000	21000	6240247	7800	25000	28000	10	6240253
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	6240247	<2.0	<2.0	<2.0	2.0	6240253
Acid Extractable Arsenic (As)	mg/kg	69	190	190	6240247	82	43	34	2.0	6240253
Acid Extractable Barium (Ba)	mg/kg	21	32	33	6240247	11	29	30	5.0	6240253
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	6240247	<2.0	<2.0	<2.0	2.0	6240253
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	6240247	<2.0	<2.0	<2.0	2.0	6240253
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	6240247	<50	<50	<50	50	6240253
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	6240247	<0.30	<0.30	<0.30	0.30	6240253
Acid Extractable Chromium (Cr)	mg/kg	16	26	26	6240247	8.8	25	31	2.0	6240253
Acid Extractable Cobalt (Co)	mg/kg	4.8	6.1	6.2	6240247	<1.0	4.3	7.4	1.0	6240253
Acid Extractable Copper (Cu)	mg/kg	4.2	9.2	9.3	6240247	2.8	7.9	11	2.0	6240253
Acid Extractable Iron (Fe)	mg/kg	19000	32000	32000	6240247	21000	29000	36000	50	6240253
Acid Extractable Lead (Pb)	mg/kg	9.3	11	11	6240247	9.7	13	15	0.50	6240253
Acid Extractable Lithium (Li)	mg/kg	23	27	28	6240247	3.9	23	33	2.0	6240253
Acid Extractable Manganese (Mn)	mg/kg	260	310	310	6240247	86	200	510	2.0	6240253
Acid Extractable Mercury (Hg)	mg/kg	0.11	0.13	0.12	6240247	0.15	0.20	0.18	0.10	6240253
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	6240247	<2.0	<2.0	<2.0	2.0	6240253
Acid Extractable Nickel (Ni)	mg/kg	9.8	15	15	6240247	3.1	11	16	2.0	6240253
Acid Extractable Rubidium (Rb)	mg/kg	9.0	12	12	6240247	6.9	9.9	11	2.0	6240253
Acid Extractable Selenium (Se)	mg/kg	<1.0	1.3	1.3	6240247	<1.0	1.9	1.5	1.0	6240253
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	6240247	<0.50	<0.50	<0.50	0.50	6240253
Acid Extractable Strontium (Sr)	mg/kg	5.4	5.6	5.8	6240247	<5.0	5.4	<5.0	5.0	6240253
Acid Extractable Thallium (Tl)	mg/kg	0.12	0.12	0.14	6240247	0.13	0.14	0.17	0.10	6240253
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	6240247	1.0	<1.0	1.1	1.0	6240253
Acid Extractable Uranium (U)	mg/kg	0.54	0.75	0.78	6240247	0.45	0.83	0.68	0.10	6240253
Acid Extractable Vanadium (V)	mg/kg	24	35	35	6240247	32	38	49	2.0	6240253
Acid Extractable Zinc (Zn)	mg/kg	33	43	43	6240247	11	32	50	5.0	6240253

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		KGT695	KGT696	KGT697	KGT698		KGT699		KGT700		
Sampling Date		2019/07/11	2019/07/11	2019/07/12	2019/07/12		2019/07/12		2019/07/12		
COC Number		D40591	D40591	D40591	D40591		D40591		D40591		
	UNITS	**SA24**	**SA25**	**SA26**	**SA27**	**RDL**	**SA28**	**RDL**	**SA29**	**RDL**	**QC Batch**
Metals											
Acid Extractable Aluminum (Al)	mg/kg	21000	25000	16000	16000	10	18000	10	16000	10	6240253
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	6240253
Acid Extractable Arsenic (As)	mg/kg	75	140	110	74	2.0	3900	20	130	2.0	6240253
Acid Extractable Barium (Ba)	mg/kg	21	33	36	34	5.0	42	5.0	41	5.0	6240253
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	6240253
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	6240253
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	<50	50	<50	50	6240253
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	0.30	<0.30	0.30	<0.30	0.30	6240253
Acid Extractable Chromium (Cr)	mg/kg	23	27	21	19	2.0	66	2.0	24	2.0	6240253
Acid Extractable Cobalt (Co)	mg/kg	3.2	5.6	7.1	4.5	1.0	18	1.0	7.8	1.0	6240253
Acid Extractable Copper (Cu)	mg/kg	7.1	17	11	9.0	2.0	91	2.0	31	2.0	6240253
Acid Extractable Iron (Fe)	mg/kg	31000	38000	27000	23000	50	40000	50	26000	50	6240253
Acid Extractable Lead (Pb)	mg/kg	14	14	19	15	0.50	34	0.50	19	0.50	6240253
Acid Extractable Lithium (Li)	mg/kg	18	29	26	21	2.0	69	2.0	36	2.0	6240253
Acid Extractable Manganese (Mn)	mg/kg	160	310	360	270	2.0	660	2.0	440	2.0	6240253
Acid Extractable Mercury (Hg)	mg/kg	0.19	0.18	<0.10	0.14	0.10	<0.10	0.10	<0.10	0.10	6240253
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	4.9	2.0	<2.0	2.0	6240253
Acid Extractable Nickel (Ni)	mg/kg	8.6	16	14	11	2.0	38	2.0	23	2.0	6240253
Acid Extractable Rubidium (Rb)	mg/kg	7.2	9.1	12	10	2.0	16	2.0	16	2.0	6240253
Acid Extractable Selenium (Se)	mg/kg	1.4	1.6	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	6240253
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	27	0.50	<0.50	0.50	6240253
Acid Extractable Strontium (Sr)	mg/kg	<5.0	8.1	7.3	6.9	5.0	27	5.0	9.2	5.0	6240253
Acid Extractable Thallium (Tl)	mg/kg	0.13	0.14	0.12	0.11	0.10	0.24	0.10	0.19	0.10	6240253
Acid Extractable Tin (Sn)	mg/kg	1.2	<1.0	<1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	6240253
Acid Extractable Uranium (U)	mg/kg	0.58	0.68	0.68	0.61	0.10	0.94	0.10	0.90	0.10	6240253
Acid Extractable Vanadium (V)	mg/kg	45	31	30	29	2.0	33	2.0	28	2.0	6240253
Acid Extractable Zinc (Zn)	mg/kg	26	52	45	35	5.0	79	5.0	60	5.0	6240253

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		KGT701	KGT701		
Sampling Date		2019/07/11	2019/07/11		
COC Number		D40591	D40591		
	UNITS	**DUP1**	**DUP1 Lab-Dup**	**RDL**	**QC Batch**
Metals					
Acid Extractable Aluminum (Al)	mg/kg	20000	19000	10	6240253
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	2.0	6240253
Acid Extractable Arsenic (As)	mg/kg	14	13	2.0	6240253
Acid Extractable Barium (Ba)	mg/kg	44	43	5.0	6240253
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	2.0	6240253
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	2.0	6240253
Acid Extractable Boron (B)	mg/kg	<50	<50	50	6240253
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	0.30	6240253
Acid Extractable Chromium (Cr)	mg/kg	23	23	2.0	6240253
Acid Extractable Cobalt (Co)	mg/kg	11	10	1.0	6240253
Acid Extractable Copper (Cu)	mg/kg	16	16	2.0	6240253
Acid Extractable Iron (Fe)	mg/kg	30000	29000	50	6240253
Acid Extractable Lead (Pb)	mg/kg	16	15	0.50	6240253
Acid Extractable Lithium (Li)	mg/kg	32	30	2.0	6240253
Acid Extractable Manganese (Mn)	mg/kg	640	610	2.0	6240253
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	0.10	6240253
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	2.0	6240253
Acid Extractable Nickel (Ni)	mg/kg	18	18	2.0	6240253
Acid Extractable Rubidium (Rb)	mg/kg	16	16	2.0	6240253
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	1.0	6240253
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	0.50	6240253
Acid Extractable Strontium (Sr)	mg/kg	8.7	9.1	5.0	6240253
Acid Extractable Thallium (Tl)	mg/kg	0.16	0.14	0.10	6240253
Acid Extractable Tin (Sn)	mg/kg	<1.0	<1.0	1.0	6240253
Acid Extractable Uranium (U)	mg/kg	1.0	1.0	0.10	6240253
Acid Extractable Vanadium (V)	mg/kg	27	25	2.0	6240253
Acid Extractable Zinc (Zn)	mg/kg	50	48	5.0	6240253

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

RESULTS OF ANALYSES OF WATER

BV Labs ID		KGT703	KGT704	KGT705	KGT706	KGT707		
Sampling Date		2019/07/10	2019/07/10	2019/07/11	2019/07/11	2019/07/11		
COC Number		D40449	D40449	D40449	D40449	D40449		
	UNITS	**SW1**	**SW2**	**SW3**	**SW4**	**DUP2**	**RDL**	**QC Batch**
ELEMENTS								
Total Mercury (Hg)	ug/L	<0.0020	<0.0020	0.0027	<0.0020	<0.0020	0.0020	6238124

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		KGT703	KGT704	KGT705	KGT706	KGT707		
Sampling Date		2019/07/10	2019/07/10	2019/07/11	2019/07/11	2019/07/11		
COC Number		D40449	D40449	D40449	D40449	D40449		
	UNITS	**SW1**	**SW2**	**SW3**	**SW4**	**DUP2**	**RDL**	**QC Batch**
Metals								
Total Aluminum (Al)	ug/L	41	280	170	280	280	5.0	6231677
Total Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6231677
Total Arsenic (As)	ug/L	32	4.3	<1.0	4.6	4.7	1.0	6231677
Total Barium (Ba)	ug/L	3.7	2.4	5.5	3.0	3.0	1.0	6231677
Total Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6231677
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6231677
Total Boron (B)	ug/L	<50	<50	<50	<50	<50	50	6231677
Total Cadmium (Cd)	ug/L	<0.010	0.013	0.014	0.013	0.017	0.010	6231677
Total Calcium (Ca)	ug/L	3600	580	1100	670	710	100	6231677
Total Chromium (Cr)	ug/L	<1.0	1.0	1.0	1.0	5.7	1.0	6231677
Total Cobalt (Co)	ug/L	<0.40	<0.40	0.74	<0.40	<0.40	0.40	6231677
Total Copper (Cu)	ug/L	1.4	0.51	<0.50	<0.50	0.59	0.50	6231677
Total Iron (Fe)	ug/L	690	750	1700	660	730	50	6231677
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6231677
Total Magnesium (Mg)	ug/L	650	270	430	300	310	100	6231677
Total Manganese (Mn)	ug/L	67	43	69	43	46	2.0	6231677
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6231677
Total Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	2.2	2.0	6231677
Total Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	100	6231677
Total Potassium (K)	ug/L	530	130	380	100	<100	100	6231677
Total Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6231677
Total Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6231677
Total Sodium (Na)	ug/L	1800	1900	2500	1900	2000	100	6231677
Total Strontium (Sr)	ug/L	18	4.2	8.4	5.8	6.4	2.0	6231677
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6231677
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6231677
Total Titanium (Ti)	ug/L	<2.0	2.4	2.0	3.3	2.6	2.0	6231677
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	6231677
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6231677
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	6231677

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

BV Labs ID: KGT667 **Collected:** 2019/07/10
Sample ID: SA1 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT668 **Collected:** 2019/07/10
Sample ID: SA2 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT669 **Collected:** 2019/07/10
Sample ID: SA3 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT670 **Collected:** 2019/07/10
Sample ID: SA4 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT671 **Collected:** 2019/07/10
Sample ID: SA5 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT672 **Collected:** 2019/07/10
Sample ID: SA6 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT673 **Collected:** 2019/07/10
Sample ID: SA7 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

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TEST SUMMARY

BV Labs ID: KGT674 **Collected:** 2019/07/10
Sample ID: SA8 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT675 **Collected:** 2019/07/10
Sample ID: SA9 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT676 **Collected:** 2019/07/10
Sample ID: SA10 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT678 **Collected:** 2019/07/10
Sample ID: SA11 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT679 **Collected:** 2019/07/10
Sample ID: SA12 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT680 **Collected:** 2019/07/10
Sample ID: SA13 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT681 **Collected:** 2019/07/11
Sample ID: SA14 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
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Sampler Initials: MP

TEST SUMMARY

BV Labs ID: KGT682 **Collected:** 2019/07/11
Sample ID: SA15 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT683 **Collected:** 2019/07/11
Sample ID: SA16 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT684 **Collected:** 2019/07/11
Sample ID: SA17 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT685 **Collected:** 2019/07/11
Sample ID: SA18 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT686 **Collected:** 2019/07/11
Sample ID: SA19 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT687 **Collected:** 2019/07/11
Sample ID: SA20 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT687 Dup **Collected:** 2019/07/11
Sample ID: SA20 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240247	2019/07/22	2019/07/23	Bryon Angevine

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TEST SUMMARY

BV Labs ID: KGT692 **Collected:** 2019/07/11
Sample ID: SA21 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT693 **Collected:** 2019/07/11
Sample ID: SA22 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT694 **Collected:** 2019/07/11
Sample ID: SA23 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT695 **Collected:** 2019/07/11
Sample ID: SA24 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT696 **Collected:** 2019/07/11
Sample ID: SA25 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT697 **Collected:** 2019/07/12
Sample ID: SA26 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT698 **Collected:** 2019/07/12
Sample ID: SA27 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

TEST SUMMARY

BV Labs ID: KGT699 **Collected:** 2019/07/12
Sample ID: SA28 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT700 **Collected:** 2019/07/12
Sample ID: SA29 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT701 **Collected:** 2019/07/11
Sample ID: DUP1 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT701 Dup **Collected:** 2019/07/11
Sample ID: DUP1 **Shipped:**
Matrix: Soil **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	6240253	2019/07/22	2019/07/23	Bryon Angevine

BV Labs ID: KGT703 **Collected:** 2019/07/10
Sample ID: SW1 **Shipped:**
Matrix: Water **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Water Total MS	CICP/MS	6231677	2019/07/17	2019/07/17	Bryon Angevine
Mercury (Total) by CV	CV	6238124	2019/07/19	2019/07/19	Edwin Lamigo

BV Labs ID: KGT704 **Collected:** 2019/07/10
Sample ID: SW2 **Shipped:**
Matrix: Water **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Water Total MS	CICP/MS	6231677	2019/07/17	2019/07/17	Bryon Angevine
Mercury (Total) by CV	CV	6238124	2019/07/19	2019/07/19	Edwin Lamigo

BV Labs ID: KGT705 **Collected:** 2019/07/11
Sample ID: SW3 **Shipped:**
Matrix: Water **Received:** 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Water Total MS	CICP/MS	6231677	2019/07/17	2019/07/17	Bryon Angevine
Mercury (Total) by CV	CV	6238124	2019/07/19	2019/07/19	Edwin Lamigo

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

TEST SUMMARY

BV Labs ID: KGT706
Sample ID: SW4
Matrix: Water

Collected: 2019/07/11
Shipped:
Received: 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Water Total MS	CICP/MS	6231677	2019/07/17	2019/07/17	Bryon Angevine
Mercury (Total) by CV	CV	6238124	2019/07/19	2019/07/19	Edwin Lamigo

BV Labs ID: KGT707
Sample ID: DUP2
Matrix: Water

Collected: 2019/07/11
Shipped:
Received: 2019/07/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Water Total MS	CICP/MS	6231677	2019/07/17	2019/07/17	Bryon Angevine
Mercury (Total) by CV	CV	6238124	2019/07/19	2019/07/19	Edwin Lamigo

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GENERAL COMMENTS

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

Package 1	2.3°C

Mercury aliquot obtained from metals bottle for samples SW1, Sw2, Sw3, Sw4 and DUP2 as requested by client. 2019/07/16 MMC

Results relate only to the items tested.

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BV Labs Job #: B9J4560
Report Date: 2019/07/23

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6231677	Total Aluminum (Al)	2019/07/17	100	80 - 120	103	80 - 120	<5.0	ug/L		
6231677	Total Antimony (Sb)	2019/07/17	100	80 - 120	99	80 - 120	<1.0	ug/L		
6231677	Total Arsenic (As)	2019/07/17	99	80 - 120	98	80 - 120	<1.0	ug/L		
6231677	Total Barium (Ba)	2019/07/17	98	80 - 120	100	80 - 120	<1.0	ug/L		
6231677	Total Beryllium (Be)	2019/07/17	102	80 - 120	103	80 - 120	<1.0	ug/L		
6231677	Total Bismuth (Bi)	2019/07/17	99	80 - 120	102	80 - 120	<2.0	ug/L		
6231677	Total Boron (B)	2019/07/17	103	80 - 120	105	80 - 120	<50	ug/L		
6231677	Total Cadmium (Cd)	2019/07/17	99	80 - 120	98	80 - 120	<0.010	ug/L		
6231677	Total Calcium (Ca)	2019/07/17	103	80 - 120	106	80 - 120	<100	ug/L		
6231677	Total Chromium (Cr)	2019/07/17	98	80 - 120	98	80 - 120	<1.0	ug/L		
6231677	Total Cobalt (Co)	2019/07/17	99	80 - 120	100	80 - 120	<0.40	ug/L		
6231677	Total Copper (Cu)	2019/07/17	NC	80 - 120	99	80 - 120	<0.50	ug/L	2.1	20
6231677	Total Iron (Fe)	2019/07/17	103	80 - 120	105	80 - 120	<50	ug/L		
6231677	Total Lead (Pb)	2019/07/17	100	80 - 120	101	80 - 120	<0.50	ug/L		
6231677	Total Magnesium (Mg)	2019/07/17	104	80 - 120	107	80 - 120	<100	ug/L		
6231677	Total Manganese (Mn)	2019/07/17	98	80 - 120	100	80 - 120	<2.0	ug/L		
6231677	Total Molybdenum (Mo)	2019/07/17	105	80 - 120	106	80 - 120	<2.0	ug/L		
6231677	Total Nickel (Ni)	2019/07/17	100	80 - 120	101	80 - 120	<2.0	ug/L		
6231677	Total Phosphorus (P)	2019/07/17	105	80 - 120	105	80 - 120	<100	ug/L		
6231677	Total Potassium (K)	2019/07/17	102	80 - 120	101	80 - 120	<100	ug/L		
6231677	Total Selenium (Se)	2019/07/17	99	80 - 120	100	80 - 120	<1.0	ug/L		
6231677	Total Silver (Ag)	2019/07/17	98	80 - 120	98	80 - 120	<0.10	ug/L		
6231677	Total Sodium (Na)	2019/07/17	98	80 - 120	100	80 - 120	<100	ug/L		
6231677	Total Strontium (Sr)	2019/07/17	101	80 - 120	102	80 - 120	<2.0	ug/L		
6231677	Total Thallium (Tl)	2019/07/17	102	80 - 120	104	80 - 120	<0.10	ug/L		
6231677	Total Tin (Sn)	2019/07/17	104	80 - 120	103	80 - 120	<2.0	ug/L		
6231677	Total Titanium (Ti)	2019/07/17	97	80 - 120	98	80 - 120	<2.0	ug/L		
6231677	Total Uranium (U)	2019/07/17	103	80 - 120	105	80 - 120	<0.10	ug/L		
6231677	Total Vanadium (V)	2019/07/17	99	80 - 120	101	80 - 120	<2.0	ug/L		
6231677	Total Zinc (Zn)	2019/07/17	97	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
6238124	Total Mercury (Hg)	2019/07/19	109	80 - 120	96	80 - 120	<0.0020	ug/L	NC	20
6240247	Acid Extractable Aluminum (Al)	2019/07/23					<10	mg/kg	0.41	35

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6240247	Acid Extractable Antimony (Sb)	2019/07/23	104	75 - 125	107	75 - 125	<2.0	mg/kg	NC	35
6240247	Acid Extractable Arsenic (As)	2019/07/23	NC	75 - 125	99	75 - 125	<2.0	mg/kg	1.6	35
6240247	Acid Extractable Barium (Ba)	2019/07/23	125	75 - 125	108	75 - 125	<5.0	mg/kg	1.2	35
6240247	Acid Extractable Beryllium (Be)	2019/07/23	117	75 - 125	109	75 - 125	<2.0	mg/kg	NC	35
6240247	Acid Extractable Bismuth (Bi)	2019/07/23	115	75 - 125	106	75 - 125	<2.0	mg/kg	NC	35
6240247	Acid Extractable Boron (B)	2019/07/23	106	75 - 125	112	75 - 125	<50	mg/kg	NC	35
6240247	Acid Extractable Cadmium (Cd)	2019/07/23	106	75 - 125	98	75 - 125	<0.30	mg/kg	NC	35
6240247	Acid Extractable Chromium (Cr)	2019/07/23	109	75 - 125	100	75 - 125	<2.0	mg/kg	0.54	35
6240247	Acid Extractable Cobalt (Co)	2019/07/23	106	75 - 125	99	75 - 125	<1.0	mg/kg	1.7	35
6240247	Acid Extractable Copper (Cu)	2019/07/23	102	75 - 125	95	75 - 125	<2.0	mg/kg	1.2	35
6240247	Acid Extractable Iron (Fe)	2019/07/23					<50	mg/kg	0.018	35
6240247	Acid Extractable Lead (Pb)	2019/07/23	112	75 - 125	105	75 - 125	<0.50	mg/kg	0.14	35
6240247	Acid Extractable Lithium (Li)	2019/07/23	119	75 - 125	104	75 - 125	<2.0	mg/kg	1.1	35
6240247	Acid Extractable Manganese (Mn)	2019/07/23	NC	75 - 125	105	75 - 125	<2.0	mg/kg	0.93	35
6240247	Acid Extractable Mercury (Hg)	2019/07/23	102	75 - 125	109	75 - 125	<0.10	mg/kg	7.8	35
6240247	Acid Extractable Molybdenum (Mo)	2019/07/23	113	75 - 125	104	75 - 125	<2.0	mg/kg	NC	35
6240247	Acid Extractable Nickel (Ni)	2019/07/23	107	75 - 125	99	75 - 125	<2.0	mg/kg	1.9	35
6240247	Acid Extractable Rubidium (Rb)	2019/07/23	112	75 - 125	102	75 - 125	<2.0	mg/kg	2.1	35
6240247	Acid Extractable Selenium (Se)	2019/07/23	100	75 - 125	97	75 - 125	<1.0	mg/kg	2.2	35
6240247	Acid Extractable Silver (Ag)	2019/07/23	106	75 - 125	101	75 - 125	<0.50	mg/kg	NC	35
6240247	Acid Extractable Strontium (Sr)	2019/07/23	116	75 - 125	103	75 - 125	<5.0	mg/kg	2.6	35
6240247	Acid Extractable Thallium (Tl)	2019/07/23	113	75 - 125	105	75 - 125	<0.10	mg/kg	13	35
6240247	Acid Extractable Tin (Sn)	2019/07/23	115	75 - 125	102	75 - 125	<1.0	mg/kg	NC	35
6240247	Acid Extractable Uranium (U)	2019/07/23	111	75 - 125	103	75 - 125	<0.10	mg/kg	3.9	35
6240247	Acid Extractable Vanadium (V)	2019/07/23	110	75 - 125	102	75 - 125	<2.0	mg/kg	0.24	35
6240247	Acid Extractable Zinc (Zn)	2019/07/23	110	75 - 125	97	75 - 125	<5.0	mg/kg	1.6	35
6240253	Acid Extractable Aluminum (Al)	2019/07/23					<10	mg/kg	4.4	35
6240253	Acid Extractable Antimony (Sb)	2019/07/23	108	75 - 125	108	75 - 125	<2.0	mg/kg	NC	35
6240253	Acid Extractable Arsenic (As)	2019/07/23	97	75 - 125	101	75 - 125	<2.0	mg/kg	5.6	35
6240253	Acid Extractable Barium (Ba)	2019/07/23	116	75 - 125	109	75 - 125	<5.0	mg/kg	3.1	35
6240253	Acid Extractable Beryllium (Be)	2019/07/23	113	75 - 125	109	75 - 125	<2.0	mg/kg	NC	35
6240253	Acid Extractable Bismuth (Bi)	2019/07/23	113	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6240253	Acid Extractable Boron (B)	2019/07/23	105	75 - 125	112	75 - 125	<50	mg/kg	NC	35
6240253	Acid Extractable Cadmium (Cd)	2019/07/23	98	75 - 125	99	75 - 125	<0.30	mg/kg	NC	35
6240253	Acid Extractable Chromium (Cr)	2019/07/23	103	75 - 125	101	75 - 125	<2.0	mg/kg	2.9	35
6240253	Acid Extractable Cobalt (Co)	2019/07/23	99	75 - 125	100	75 - 125	<1.0	mg/kg	7.3	35
6240253	Acid Extractable Copper (Cu)	2019/07/23	94	75 - 125	96	75 - 125	<2.0	mg/kg	2.6	35
6240253	Acid Extractable Iron (Fe)	2019/07/23					<50	mg/kg	2.5	35
6240253	Acid Extractable Lead (Pb)	2019/07/23	104	75 - 125	105	75 - 125	<0.50	mg/kg	5.0	35
6240253	Acid Extractable Lithium (Li)	2019/07/23	114	75 - 125	104	75 - 125	<2.0	mg/kg	6.2	35
6240253	Acid Extractable Manganese (Mn)	2019/07/23	NC	75 - 125	106	75 - 125	<2.0	mg/kg	4.9	35
6240253	Acid Extractable Mercury (Hg)	2019/07/23	101	75 - 125	107	75 - 125	<0.10	mg/kg	NC	35
6240253	Acid Extractable Molybdenum (Mo)	2019/07/23	108	75 - 125	105	75 - 125	<2.0	mg/kg	NC	35
6240253	Acid Extractable Nickel (Ni)	2019/07/23	97	75 - 125	99	75 - 125	<2.0	mg/kg	4.8	35
6240253	Acid Extractable Rubidium (Rb)	2019/07/23	110	75 - 125	106	75 - 125	<2.0	mg/kg	4.3	35
6240253	Acid Extractable Selenium (Se)	2019/07/23	94	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35
6240253	Acid Extractable Silver (Ag)	2019/07/23	102	75 - 125	100	75 - 125	<0.50	mg/kg	NC	35
6240253	Acid Extractable Strontium (Sr)	2019/07/23	111	75 - 125	106	75 - 125	<5.0	mg/kg	4.5	35
6240253	Acid Extractable Thallium (Tl)	2019/07/23	114	75 - 125	106	75 - 125	<0.10	mg/kg	13	35
6240253	Acid Extractable Tin (Sn)	2019/07/23	114	75 - 125	108	75 - 125	<1.0	mg/kg	NC	35
6240253	Acid Extractable Uranium (U)	2019/07/23	105	75 - 125	105	75 - 125	<0.10	mg/kg	2.1	35
6240253	Acid Extractable Vanadium (V)	2019/07/23	103	75 - 125	104	75 - 125	<2.0	mg/kg	5.1	35
6240253	Acid Extractable Zinc (Zn)	2019/07/23	103	75 - 125	102	75 - 125	<5.0	mg/kg	3.2	35

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.

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).

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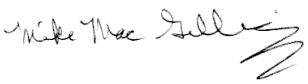
BV Labs Job #: B9J4560
Report Date: 2019/07/23

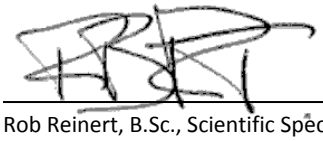
Stantec Consulting Ltd
Client Project #: 121619250.2500.955
Site Location: BEAVER DAM
Sampler Initials: MP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)



Rob Reinert, B.Sc., Scientific Specialist

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

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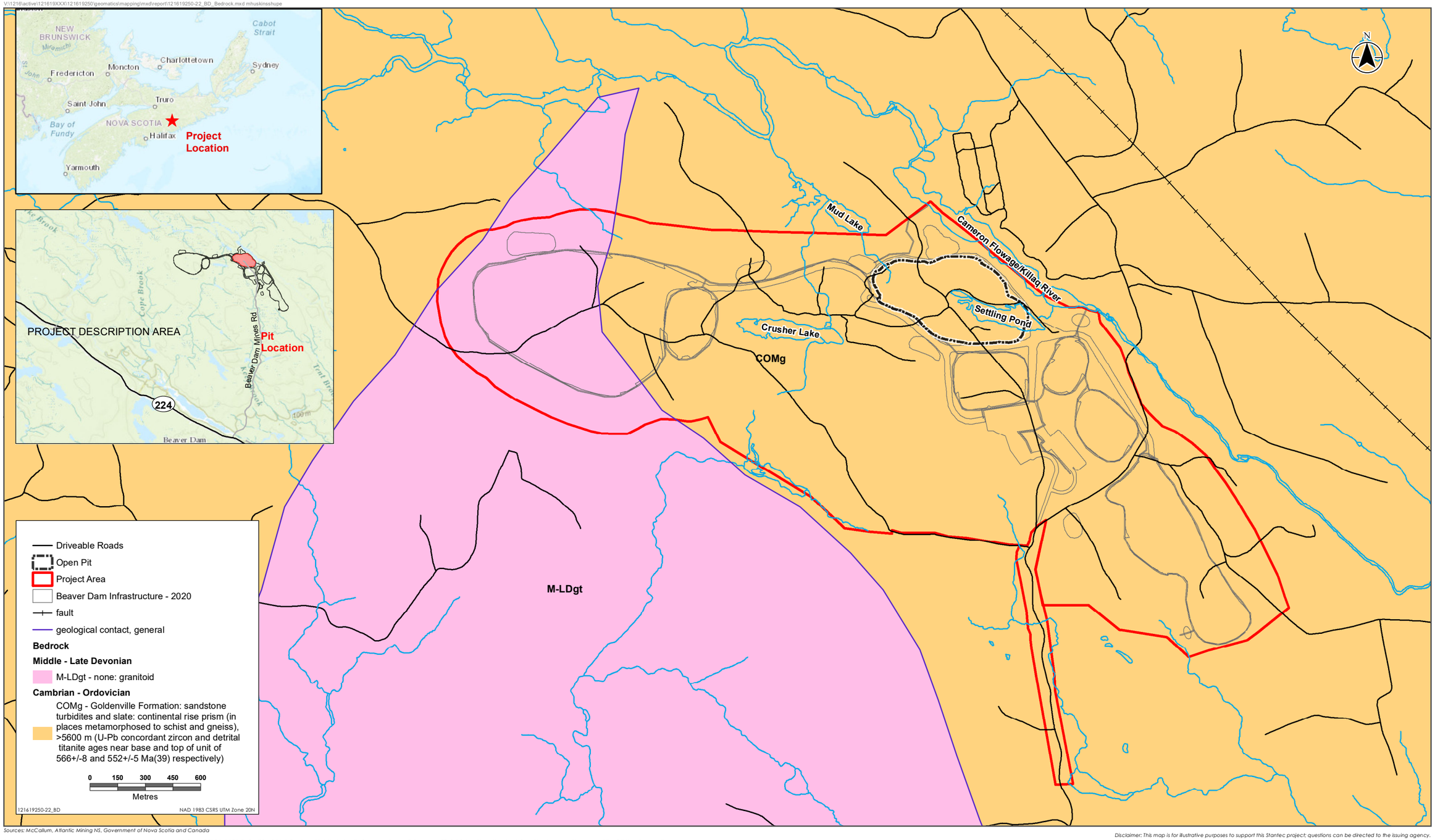

Sources: McCallum, Atlantic Mining NS, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Bedrock Geology - Beaver Dam Project

Stantec

ATLANTIC MINING NS

Drawing No. G-1
Appendix G

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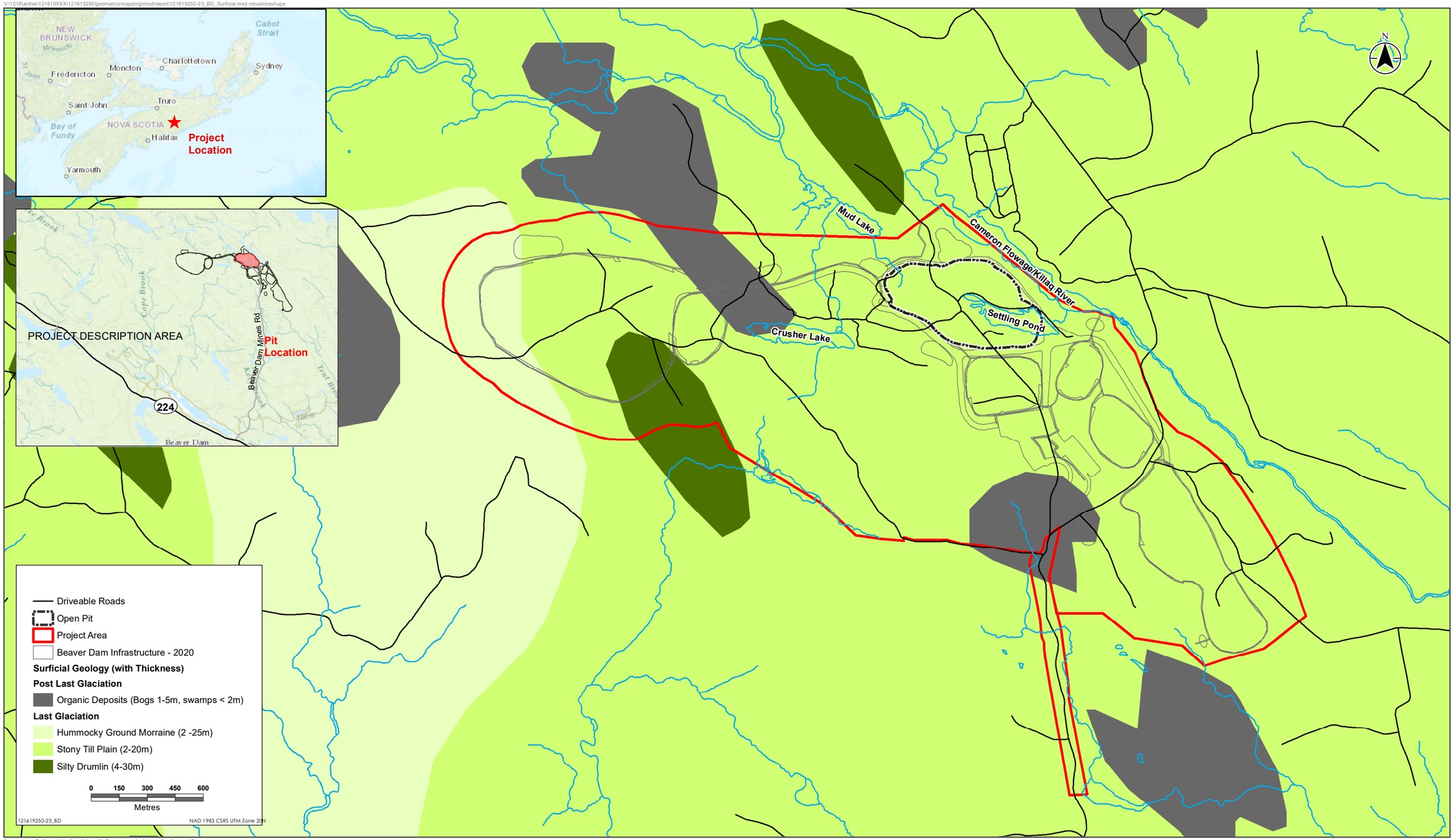

Sources: McCallum, Atlantic Mining NS, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Surficial Geology - Beaver Dam Project

Stantec

ATLANTIC MINING NS

Drawing No. G-2
Appendix G

Nova Scotia Department of Natural Resources
Minerals and Energy Branch

Map ME 2000-1

Geological Map of the Province of

Nova Scotia

Compiled by J. D. Keppie

Halifax, Nova Scotia
2000

scale 1:500 000

kilometres 20 0 20 40 kilometres

Map Notes

Universal Tranverse Mercator (UTM) Projection. Zone 20, Central Meridian 63°00' West.

North American Datum (NAD) 1927.

Base data derived from the Nova Scotia Topographic Database (NSTDB). Copyright Her Majesty the Queen in Right of the Province of Nova Scotia. The NSTDB is available from the Department of Housing and Municipal Affairs (DHMA), Land Information Services Division (LIS), Nova Scotia Geomatics Centre (NSGC), Amherst, Nova Scotia.

Digitization of geology maps by Maritime Resource Management Service / Land Registration Information Service.

Digital compilation by the Geological Survey of Canada (GSC) Atlantic.

Further digital map compilation, database development, and map production by the Nova Scotia Department of Natural Resources.

Funding for this project provided by the Nova Scotia Department of Natural Resources and the Geological Survey of Canada.

Printed copies of maps and legend are available from the Library, Nova Scotia Department of Natural Resources, Halifax, Nova Scotia.

A digital version of this map information may be downloaded from the Nova Scotia Department of Natural Resources, Minerals and Energy Branch web site at: http://www.gov.ns.ca/nat/mety/

Disclaimer

This map is a compilation of existing geological information, base mapping and age dates with some interpretation by the compiler. The Nova Scotia Department of Natural Resources does not assume any liability for errors that may occur. This map is intended for use at the published scale of 1:500 000.

This map and legend were printed using dye-based inks which are subject to fading. It is recommended that you store out of direct light where not in use to lengthen life of product.

Recommended Citation

Keppie, J.D. (compiler) 2000: Geological Map of the Province of Nova Scotia. Nova Scotia Department of Natural Resources, Minerals and Energy Branch, Map ME 2000-1, scale 1:500 000.

Map Symbols

Geological boundary (approximate)
Fault (approximate, assumed)
Dyke (approximate, assumed)
Age date localities; Ma [reference]
[see legend for reference list]
(specific, general)
($^{40}Ar/^{39}Ar$)
(Rb-Sr whole rock isochron)
(U-Pb)

Nova Scotia Department of Natural Resources
Minerals and Energy Branch

Index of References for Geological Information
for the
Geological Map of the Province of Nova Scotia
2000

scale 1:1 000 000

Note: See legend for list of geological references.

References 2K, 4K provide Provincial coverage, therefore they are not outlined here.

Sable Island

NOVA SCOTIA
Natural Resources

CANADA
MINERAL AND ENERGY TECHNOLOGY SECTOR

28 December, 1999

Nova Scotia Department of Natural Resources
Minerals and Energy Branch

Map ME 2000-1

Legend for the Geological Map
of the Province of

Nova Scotia

Compiled by J. D. Keppie
Halifax, Nova Scotia
2000

GEOLOGICAL TIME CHART

EON / ERATHEM	ERA / SYSTEM	PERIOD / SERIES	EPOCH / STAGE	AGE	AGE (Ma)
PHANEROZOIC	MESOZOIC	CRETACEOUS (K)	EARLY	NEOCOMIAN	127.0±1.6
					132.0±1.9
					137.0±2.2
					144.2±2.6
		JURASSIC (J)	EARLY	PLIENSBACHIAN	189.6±4.0
				SINEMURIAN	195.3±3.9
				HETTANGIAN	201.9±4.0
			LATE	RHAETIAN	205.7±4.0
		TRIASSIC (T)		NORIAN	209.6±4.1
				CARNIAN	220.7±4.4
			MIDDLE	LADINIAN	227.4±5.5
				ANISIAN	234.3±4.6
			EARLY	SPATHIAN	241.7±4.7
				SMITHIAN	244.8±4.8
				DIENERIAN	248.2±4.8
				GRIESBACHIAN	
			LATE	OCHOAN	252.5
				TATARIAN	255.5
			MIDDLE	CAPITANIAN	260.1
				WORDIAN	264.1
				ROADIAN	267.1
		PERMIAN (P)		KUNGURIAN	
			EARLY	LEONARDIAN	278.1
				ARTINSKIAN	
				SAKMARIAN	
				ASSELIAN	292.1
		CARBONIFEROUS (C)	PENNSYLVANIAN	VIRGILIAN	300.4
				MISSOURIAN	303.3
				KASIMOVIAN	305.5
				MOSCOVIAN	309.4
				DESMOINESIAN	311.4
				ATOKAN	315.2
				BASHKIRIAN	316.5
			MORROWAN		320.5
			CHESTERIAN	SERPUKHOVIAN	323.6
				NAMURIAN	326.4
			MERAMECIAN		330.4
				VISÉAN	334.4
			OSAGEAN		338.4
			KINDERHOOKIAN		341.4
					345.4
				TOURNAISIAN	353.4
		DEVONIAN (D)	LATE	FAMENNIAN	367.6
				FRASNIAN	375.6
			MIDDLE	GIVETIAN	
				COUVINIAN	386.6
				EIFELIAN	
			EARLY	DALEJAN	392.2
				ZLICHOVIAN	EMSIAN
				PRAGIAN	401.9
				LOCHKOVIAN	410.6
		SILURIAN (S)	LATE	PRIDOLI	420.6
			LUDLOW	LUDFORDIAN	
				GORSTIAN	426.4
			WENLOCK	HOMERIAN	
				SHEINWOODIAN	431.4
			EARLY	LLANDOVERY	TELYCHIAN	434.4
					AERONIAN	438.4
					RHUDDANIAN	443.7
		ORDOVICIAN (O)	ASHGILL	LATE	GAMACHIAN	445.2
					RICHMONDIAN	447.4
					MAYSVILLIAN	450.4
			CARADOC		EDENIAN	453.3
			LLANDEILO	MIDDLE	TRENTONIAN	SHERMAN FALLS - KIRKFIELDIAN	457.1
						ROCKLANDIAN	460.4
			LLANVIRN		BLACKRIVERIAN	462.4
					CHAZYAN	
			ARENIG			468.3
			TREMADOC	EARLY	CANADIAN (INTERN.)		490±5
				LATE		TREMPEALEAUAN	510±10
				MIDDLE		FRANCONIAN	515±10
						DRESBACHIAN	
		CAMBRIAN (€)				TOYONIAN	520±10
						BOTOMIAN	524±5
			EARLY	PLACENTIAN		ATDABANIAN	527±5
						TOMMOTIAN	530±5
						MANYKAIAN	
							544±2
PROTEROZOIC (E)	NEOPROTEROZOIC (n)	EDIACARAN					
		VENDIAN					
		NEOPROTEROZOIC III (3)					
		HADRYNIAN		VARANGER			590±20
		NEOHADRYNIAN					610
		CRYOGENIAN (K)	STURTIAN				
			RIPHEAN	KARATAU			650
							700
							730
							900
	MESOPROTEROZOIC (m)	NEOHELIKIAN	PALEOHAO				1000
			TONIAN				1050±50
		STENIAN	RIPHEAN	YURMATIN			1100
							1200
							1300

SOUTHERN MAINLAND

EK (EK): red and grey clay, kaolin, silica sand, lignite

NEWARK SUPERGROUP

FUNDY GROUP (TJf): undivided

SCOTS BAY FORMATION (EJFs): lacustrine limestone, siltstone, chert, fluvial sandstone, >40 m (Hettangian and younger vertebrate fossils)

NORTH MOUNTAIN FORMATION (EJFn): tholeiitic plateau basalt, 270 m (U-Pb concordant zircon age in basal flow of 202±1 Ma[1])

BLOMIDON FORMATION (LTr-EJFb): lacustrine playa, sandflat, and deltaic clastic rocks, minor aeolian sandstone and conglomerate, 200 m (?Carnian-Hettangian spores and fossils)

WOLFVILLE FORMATION (M-LTrFw): fluvial sandstone and conglomerate, aeolian sandstone, minor deltaic-lacustrine deposits, >300 m (Anisian-?Carnian spores and fossils)

Unconformable on Early Carboniferous-Cambrian rocks

SHELBURNE DYKE (Jkr)

CUMBERLAND GROUP (LCc): undivided

SCOTCH VILLAGE FORMATION (LCCsv): fluvial sandstone, siltstone, shale, >400 m (Early Westphalian plants and spores)

LCMg (LCMg): monzogranite (U-Pb concordant zircon age of ca. 316±5 Ma[1]; intruded Goldenville Formation)

Unconformable on Visean-Namurian Malkey Group

MABOU GROUP (E-LCM): undivided

WATERING BROOK FORMATION (E-LCMw): siltstone, minor sandstone, gypsum and anhydrite, >150 m (Visean (Brigantian)-Namurian spores)

WINDSOR GROUP (ECw): undivided, 1000 m

UPPER WINDSOR GROUP (ECWu): *MURPHY ROAD, PESAQUID and GREEN OAKS FORMATIONS*: siltstone, minor gypsum and shallow marine limestone (Visean (Asbian), C-E subzones fauna and spores)

MIDDLE WINDSOR GROUP (ECWm): *WENTWORTH STATION, MILLER CREEK, MACCONNELL ROAD and ELDERBANK FORMATIONS*: gypsum, minor siltstone, marine limestone and dolostone (Visean (Holkerian), B subzone fauna and spores)

LOWER WINDSOR GROUP (ECWl): *WHITE QUARRY, STEMLACHE, CARROLLS CORNER, MACUMBER and GAYS RIVER FORMATIONS*: anhydrite, salt, marine dolostone and limestone (Visean (Arundian), A subzone fauna and spores)

Locally unconformable on Devonian granitoids and Meguma Group

HORTON GROUP (LDsCm): undivided, 0-1650 m

COLDSTREAM FORMATION (LDmCm): fluvial conglomerate, sandstone and minor shale; 0- >100 m (Tournaisian (Courceyan) (Tn3-7V1/2) spores and fauna)

CHEVERIE FORMATION (LDmCv): fluvial arkose, sandstone, siltstone and conglomerate, >250 m (Tournaisian (Courceyan) (Tn3) spores and fauna)

Unconformable on Devonian granitoids and Meguma Group

LISCOMB COMPLEX (M-LDLg): undivided

(M-LDLgg): Paragneiss: sillimanite-garnet-cordierite quartz-feldspathic gneiss and schist

(M-LDLgi): Orthogneiss: garnet-hornblende gneiss, quartzo-feldspathic augen gneiss ($^{206}Pb/^{204}Pb$ total-gas ages on hornblende and mica of 377-371 Ma[38]; Complex intruded Meguma Group)

M-LDLgg M-LDLgi M-LDLg1 M-LDLg2 M-LDLd1 M-LDLd2 M-LDmg M-LDmbg M-LDmbmg M-LDmg M-LDmtg M-LDmig M-LDmg1 M-LDgi

granite, pegmatite, aplite (M-LDgg) | gneiss (M-LDd) | granite (M-LDd) | granodiorite, tonalite (M-LDd2) | monzogranite (M-LDmg) | monzogranite, quartz monzonite (M-LDmbg) | monzogranite (M-LDmbmg) | leucogranite, monzogranite (M-LDmg) | monzogranite, granodiorite (M-LDmtg) | monzogranite, granodiorite, tonalite (M-LDmig) | granitoid (M-LDgi)

(U-Pb concordant zircon and monazite age range of 378.5±2 to 371±2 Ma[38,41,42]; intruded all older units)

TORBROOK FORMATION (ED): shallow marine-subaerial silty mudstone, mudstone, shale, siltstone, sandstone, iron formation, and minor coliy limestone, >1300 m (Early Lochkovian-Pragian and possibly Emsian shelly fauna of Rhenish-Bohemian affinity; late Emsian - early Eifelian plants)

NEW CANAAN FORMATION (LSs): shallow marine breccia, siltstone, slate, limestone, trimodal volcanic rocks, >300 m (Late Silurian shelly fauna)

KENTVILLE FORMATION (LSs): shallow marine slate, silty slate, siltstone and limestone, 0-650 m (Ludlovian graptolites)

WHITE ROCK FORMATION (OSw and OSwv):
(OSwv): bimodal tholeiitic-alkalic lavas and volcaniclastic rocks, 400(67) m, at Yarmouth and Cape St. Mary

MEGUMA GROUP (€Om): undivided

HALIFAX FORMATION (€OMh): slope-outer shelf slate, siltstone, minor sandstone and Fe-Mn nodules (in places metamorphosed to schist), 500->4400 m (Tremadocian graptolites and acritarchs)

(OSwv): bimodal tholeiitic-alkalic lavas and volcaniclastic rocks, 400(67) m, at Yarmouth and Cape St. Mary

MOg (MOg): granite (interpreted to be coeval with White Rock Formation volcanic rocks)

Conformable disconformable on Halifax Formation

MEGUMA GROUP (€Om): undivided

HALIFAX FORMATION (€OMh): slope-outer shelf slate, siltstone, minor sandstone and Fe-Mn nodules (in places metamorphosed to schist), 500->4400 m (Tremadocian graptolites and acritarchs)

GREEN BAY FORMATION (€OMgb): sandstone turbidites and slate, 0-870 m (Middle Cambrian trilobites of Acado-Baltic affinity)

GOLDENVILLE FORMATION (€OMg): sandstone turbidites and slate: coarsening-rising prism (in places metamorphosed to schist and gneiss), >5650 m (U-Pb concordant zircon and detrital thuolite ages near base and top of unit of 566±6 and 552±5 Ma[38] respectively)

NORTHERN MAINLAND

NEWARK SUPERGROUP

FUNDY GROUP (TJf): undivided

McCOY BROOK FORMATION (EJFm): fluvial, deltaic, lacustrine, playa and aeolian clastic rocks, lacustrine limestone and basalt agglomerate, >200 m (Hettangian and younger vertebrate fossils and spores)

NORTH MOUNTAIN FORMATION (EJFn): tholeiitic plateau basalt, 100 m

BLOMIDON FORMATION (LTr-EJFb): lacustrine playa, sandflat, and deltaic clastic rocks, minor aeolian sandstone and conglomerate, 10-180 m (?Carnian-Hettangian spores and fossils)

WOLFVILLE FORMATION (M-LTrFw): fluvial sandstone and conglomerate, aeolian sandstone, minor deltaic-lacustrine deposits, 0-300 m (Anisian-?Carnian spores and fossils)

Unconformable on most Carboniferous rocks

PICTOU GROUP (LCp): undivided

CAPE JOHN FORMATION (LCPc): floodplain mudstone, fluvial sandstone, arkosic sandstone, minor conglomerate and lacustrine limestone, 350 ->400 m (Stephanian spores)

TATAMAGOUCHE FORMATION (LCPt): floodplain mudstone, fluvial sandstone, conglomerate, rare lacustrine limestone, 300-350 m (Stephanian spores)

BALFRON FORMATION (LCPb): fluvial sandstone, conglomerate, floodplain mudstone, mudstone, rare lacustrine limestone, 800-900 m (Westphalian D-Stephanian spores)

Paraconformable to unconformable on most Carboniferous rocks

CUMBERLAND GROUP (LCC): undivided

STELLARTON FORMATION (LCCs): lacustrine-alluvial shale, sandstone, minor conglomerate, oil shale, coal (early Westphalian C - early Westphalian D spores)

NEW GLASGOW CONGLOMERATE (LCCng): alluvial conglomerate, minor sandstone and siltstone

MALAGAWATCH and MIDDLE RIVER FORMATIONS (LCCm and LCCmr): braided stream sandstone, mudstone, rare coal and lacustrine limestone, 100-400 m (Westphalian C-D spores)

HAGGED REEF FORMATION (LCCn): fluvial sandstone, conglomerate, mudstone, rare coal and lacustrine limestone, 0-1000 m (Westphalian B-C spores)

MALAGAWATCH AND HAGGED REEF FORMATIONS, UNDIVIDED (LCCmn): undivided

SPRINGHILL MINES FORMATION (LCCsm): fluvial sandstone, mudstone, local lacustrine limestone, 0-1000 m (Westphalian B spores)

JOGGINS FORMATION (LCCj): floodplain mudstone, minor sandstone, coal, lacustrine limestone and shale, 0-1450 m (Westphalian A-B spores and bivalves)

POLLY BROOK FORMATION (LCCpb): alluvial conglomerate, sandstone, rare mudstone, 0-1500 m (Westphalian A-B spores)

Unconformable on Visean-Namurian Malkey Group

LCCsv LCCm LCCn LCCc E-LCMn E-LCMm E-LCMg E-LCMw ECWu ECWm ECWl ECHss ECHj ECHc D-CHn D-CHm D-CHl DCn DCm DCs DCg

CUMBERLAND GROUP (LCC): undivided

INVERNESS FORMATION (LCCi): fluvial sandstone, conglomerate, coal and shale, 800-1000 m (Westphalian C and Stephanian spores)

Unconformable on Mississippian and Pennsylvanian Cape Percy, Cape Mary and Pictou Group rocks

PORT HOOD FORMATION (LCCph): fluvial-lacustrine sandstone, shale, siltstone, coal, limestone, >1900-2700 m (Westphalian A spores)

Conformable to unconformable on Horton and Kellys Mountain formations

SILVER MINE FORMATION (LCCsv): fluvial sandstone, siltstone, mudstone, rare coal, 700 m (Westphalian A spores)

Conformable to Middle Windsor Group, Devonian volcanic rocks, Cambro-Ordovician and Proterozoic rocks

MABOU GROUP (E-LCM): undivided

POMQUET and POINT EDWARD FORMATIONS (E-LCMp): fluvial siltstone, sandstone, minor conglomerate and lacustrine limestone, 100-500 m (Namurian spores)

HASTINGS, CAPE DAUPHIN and MacKEIGAN ROAD FORMATIONS (E-LCMm): lacustrine-marine shale, siltstone, stromatolitic limestone, gypsum and anhydrite, 100-300 m (Brigantian-Namurian spores)

Conformable to unconformable on Windsor Group

WINDSOR GROUP (ECw): undivided

UPPER WINDSOR GROUP (ECWu): *HOOD ISLAND, WOODBINE ROAD and UIST FORMATIONS*: mudstone, sandstone, minor conglomerate, gypsum and shallow marine limestone, 150-700 m (Visean (Holkerian-Asbian), C-E subzones fauna and spores)

Conformable disconformable on Middle Windsor Group

MIDDLE WINDSOR GROUP (ECWm): *LOCH LOMOND, TROOM and MADOWS ROAD FORMATIONS*: halite, anhydrite, gypsum, mudstone, siltstone, sandstone, conglomerate, 300 m (Visean (Holkerian), B subzone fauna and spores)

Unconformable on Cambro-Ordovician and Neoproterozoic rocks

LOWER WINDSOR GROUP (ECWl): *KEMPT HEAD, SYDNEY RIVER, GAYS RIVER, MACBETH BROOK and MACUMBER FORMATIONS*: anhydrite, salt, gypsum, shale, marine dolostone and limestone, >150 m (Visean (Arundian), A subzone fauna and spores)

LOWER and MIDDLE WINDSOR GROUPS (ECWm): undivided

Unconformable on Devonian felsic volcanic rocks and Meguma Group

HORTON GROUP (ECH): undivided

ANGLE and STRAIGHTLINE FORMATIONS (ECHss): fluvial lacustrine sandstone, siltstone, shale, olivitic-dolomitic limestone, 100->1000 m (Courceyan-Chadian spores)

JUDIQUE FORMATION (ECHj): fluvial sandstone, minor shale, 100-500 m (Tournaisian spores)

CREIGHTON FORMATION (ECHc): fluvial-alluvial sandstone, conglomerate, 1500 m

GRANTMIRE FORMATION (ECHg): alluvial conglomerate and sandstone

FISSET BROOK FORMATION (DCfs): tholeiitic-alkalic basalt, rhyolite, fluvial-alluvial sandstone, conglomerate, 400 m (Famennian-Tournaisian); Rb-Sr whole rock isochron age of 376±12 Ma[1,2]; U-Pb concordant zircon age of 373±4 Ma[6]

McADAM LAKE FORMATION (MDm): alluvial-fluvial conglomerate, arkose, shale, felsic tuff (late Early Devonian - early Middle Devonian spores)

DCfs DCg DCgb DCdg DCgp DCd Dd Db Ds MDm

PICTOU GROUP (LCp): undivided

BROAD COVE FORMATION (LCPbc): fluvial sandstone, minor conglomerate, >200 m (Westphalian D - Stephanian spores)

MORIEN GROUP (LCm): undivided

SYDNEY MINES FORMATION (LCMs): fluvial and lacustrine mudstone, shale, siltstone, sandstone, limestone, coal, 700-1000 m (Westphalian C - Stephanian spores)

GLENGARRY VALLEY FORMATION (LCMgv): fluvial sandstone, siltstone, shale, minor coal, >250 m (Westphalian C-D spores)

BIG BARREN FORMATION (LCMb): fluvial conglomerate, sandstone, siltstone, mudstone, 600 m (Westphalian B-C spores)

WADDENS COVE FORMATION (LCMw): fluvial siltstone, mudstone, sandstone, calcrete, minor coal, 0-200 m (Westphalian C spores)

SOUTH BAR FORMATION (LCMso): fluvial sandstone, minor conglomerate, mudstone and coal, 700 m (Westphalian B-C spores)

Unconformable in Malay and Windsor Groups

LCPbc LCc LCm LCMgv LCMb LCMso LCMw LCMs LCPph LCCph

CUMBERLAND GROUP (LCC): undivided

INVERNESS FORMATION (LCCi): fluvial sandstone, conglomerate, coal and shale, 800-1000 m (Westphalian C and Stephanian spores)

Unconformable on Mississippian and Pennsylvanian Cape Percy, Cape Mary and Pictou Group rocks

PORT HOOD FORMATION (LCCph): fluvial-lacustrine sandstone, shale, siltstone, coal, limestone, >1900-2700 m (Westphalian A spores)

Conformable to unconformable on Horton and Kellys Mountain formations

SILVER MINE FORMATION (LCCsv): fluvial sandstone, siltstone, mudstone, rare coal, 700 m (Westphalian A spores)

Conformable to Middle Windsor Group, Devonian volcanic rocks, Cambro-Ordovician and Proterozoic rocks

MABOU GROUP (E-LCM): undivided

POMQUET and POINT EDWARD FORMATIONS (E-LCMp): fluvial siltstone, sandstone, minor conglomerate and lacustrine limestone, 100-500 m (Namurian spores)

HASTINGS, CAPE DAUPHIN and MacKEIGAN ROAD FORMATIONS (E-LCMm): lacustrine-marine shale, siltstone, stromatolitic limestone, gypsum and anhydrite, 100-300 m (Brigantian-Namurian spores)

Conformable disconformable on Windsor Group

WINDSOR GROUP (ECw): undivided

UPPER WINDSOR GROUP (ECWu): *HOOD ISLAND, WOODBINE ROAD and UIST FORMATIONS*: mudstone, sandstone, minor conglomerate, gypsum and shallow marine limestone, 150-700 m (Visean (Holkerian-Asbian), C-E subzones fauna and spores)

Conformable disconformable on Middle Windsor Group

MIDDLE WINDSOR GROUP (ECWm): *LOCH LOMOND, TROOM and MADOWS ROAD FORMATIONS*: halite, anhydrite, gypsum, mudstone, siltstone, sandstone, conglomerate, 300 m (Visean (Holkerian), B subzone fauna and spores)

Unconformable on Cambro-Ordovician and Neoproterozoic rocks

LOWER WINDSOR GROUP (ECWl): *KEMPT HEAD, SYDNEY RIVER, GAYS RIVER, MACBETH BROOK and MACUMBER FORMATIONS*: anhydrite, salt, gypsum, shale, marine dolostone and limestone, >150 m (Visean (Arundian), A subzone fauna and spores)

LOWER and MIDDLE WINDSOR GROUPS (ECWm): undivided

Unconformable on Devonian felsic volcanic rocks and Meguma Group

HORTON GROUP (ECH): undivided

ANGLE and STRAIGHTLINE FORMATIONS (ECHss): fluvial lacustrine sandstone, siltstone, shale, olivitic-dolomitic limestone, 100->1000 m (Courceyan-Chadian spores)

JUDIQUE FORMATION (ECHj): fluvial sandstone, minor shale, 100-500 m (Tournaisian spores)

CREIGHTON FORMATION (ECHc): fluvial-alluvial sandstone, conglomerate, 1500 m

GRANTMIRE FORMATION (ECHg): alluvial conglomerate and sandstone

FISSET BROOK FORMATION (DCfs): tholeiitic-alkalic basalt, rhyolite, fluvial-alluvial sandstone, conglomerate, 400 m (Famennian-Tournaisian); Rb-Sr whole rock isochron age of 376±12 Ma[1,2]; U-Pb concordant zircon age of 373±4 Ma[6]

McADAM LAKE FORMATION (MDm): alluvial-fluvial conglomerate, arkose, shale, felsic tuff (late Early Devonian - early Middle Devonian spores)

LCPbc LCc LCm LCMgv LCMb LCMso LCMw LCMs LCPph LCCph E-LCMm E-LCMp E-LCMg ECWu ECWm ECWl ECHss ECHj ECHc DCfs DCgb DCdg DCgp DCd Dd Db Ds MDm

(Cg): granite (Rb-Sr whole rock isochron ages of 341±6 Ma[2] for Gillanders Mountain; 330±23 Ma[4] for Wilkie Sugarloaf Pluton)

(Cgb): gabbro (U-Pb zircon and baddeleyite age of 339±2 Ma[2])

(DCg): granite (U-Pb ages of 361±2 Ma[38] for Pleasant Hills Pluton; 362±2 Ma[38] for Hunt Lake Pluton. Rb-Sr whole rock isochron ages of 349±12 Ma[38] for Cape Chignecto Pluton; 342±5 Ma[38] for West Moose River Pluton; 338±17 Ma[38] for Hanna Farm Pluton; 356±17 Ma[38] for North River Pluton; 370±15 Ma[38] for Gunn Lake Pluton; 378±12 Ma[38] for Upper Barneys River Pluton)

(DCdg): granite (Rb-Sr whole rock isochron ages of 343±25 Ma[38,41] for Deep Cove Pluton; 357±11 Ma[38] for Petit de Grat Pluton)

(Dg): granite (Rb-Sr whole rock isochron age of 384±35 Ma[38] for Pleasant Bay Pluton)

(Dgr): granite (Rb-Sr whole rock isochron age of 379±19 Ma[38] for Gillanders Mountain Pluton)

(Dgp): granodiorite (U-Pb concordant zircon age of 402±3 Ma[38] for Cameron Brook Pluton)

(Dgp): granite (Rb-Sr whole rock isochron age of 400±5 Ma[38] for West Branch North River Pluton)

(Dgp): orthogneiss (U-Pb nearly concordant zircon age of 403±3 Ma[38] for Neils Harbour orthogneiss)

(Dg): granite (U-Pb concordant monazite age of 414±3 Ma[38] for Cape North Pluton)

(SDg): granite (Rb-Sr whole rock isochron ages of 419±11 Ma[38] for Taylors Barren Pluton; 413±10 Ma[38] for Gooh Brook granite)

(SDgg): orthogneiss (U-Pb lower-intercept zircon age of 433+20/-10 Ma[38] for Belle Cote Road orthogneiss)

(Cg): granite (U-Pb concordant zircon age range of 374±3 to 350±6 Ma[1,38,41,42])

(Cgp): granite (U-Pb zircon age of 371±6 Ma[38] for Wilkie Sugarloaf Pluton)

(Cgt): granite (U-Pb concordant zircon age range of 493±2 Ma[38])

(Cgg): granite (U-Pb zircon age of 509±2 Ma[42])

(Cgp) granite, pegmatite | (Cgt) granite, tonalite | (Cgg) granite, granodiorite

CAPE BRETON ISLAND

PICTOU GROUP (LCP): undivided

BROAD COVE FORMATION (LCPbc): fluvial sandstone, minor conglomerate, >200 m (Westphalian D - Stephanian spores)

MORIEN GROUP (LCm): undivided

SYDNEY MINES FORMATION (LCMs): fluvial and lacustrine mudstone, shale, siltstone, sandstone, limestone, coal, 700-1000 m (Westphalian C - Stephanian spores)

Unconformable on Mississippian and Pennsylvanian Cape Percy, Cape Mary and Pictou Group rocks

PORT HOOD FORMATION (LCCph): fluvial-lacustrine sandstone, shale, siltstone, coal, limestone, >1900-2700 m (Westphalian A spores)

Conformable to unconformable on Horton and Kellys Mountain formations

SILVER MINE FORMATION (LCCsv): fluvial sandstone, siltstone, mudstone, rare coal, 700 m (Westphalian A spores)

Conformable to unconformable on Windsor Group

MABOU GROUP (E-LCM): undivided

POMQUET and POINT EDWARD FORMATIONS (E-LCMp): fluvial siltstone, sandstone, minor conglomerate and lacustrine limestone, 100-500 m (Namurian spores)

HASTINGS, CAPE DAUPHIN and MacKEIGAN ROAD FORMATIONS (E-LCMm): lacustrine-marine shale, siltstone, stromatolitic limestone, gypsum and anhydrite, 100-300 m (Brigantian-Namurian spores)

Conformable disconformable on Windsor Group

WINDSOR GROUP (ECw): undivided

UPPER WINDSOR GROUP (ECWu): *HOOD ISLAND, WOODBINE ROAD and UIST FORMATIONS*: mudstone, sandstone, minor conglomerate, gypsum and shallow marine limestone, 150-700 m (Visean (Holkerian-Asbian), C-E subzones fauna and spores)

Conformable disconformable on Middle Windsor Group

MIDDLE WINDSOR GROUP (ECWm): *LOCH LOMOND, TROOM and MADOWS ROAD FORMATIONS*: halite, anhydrite, gypsum, mudstone, siltstone, sandstone, conglomerate, 300 m (Visean (Holkerian), B subzone fauna and spores)

Unconformable on Cambro-Ordovician and Neoproterozoic rocks

LOWER WINDSOR GROUP (ECWl): *KEMPT HEAD, SYDNEY RIVER, GAYS RIVER, MACBETH BROOK and MACUMBER FORMATIONS*: anhydrite, salt, gypsum, shale, marine dolostone and limestone, >150 m (Visean (Arundian), A subzone fauna and spores)

LOWER and MIDDLE WINDSOR GROUPS (ECWm): undivided

Unconformable on Devonian felsic volcanic rocks and Meguma Group

HORTON GROUP (ECH): undivided

ANGLE and STRAIGHTLINE FORMATIONS (ECHss): fluvial lacustrine sandstone, siltstone, shale, olivitic-dolomitic limestone, 100->1000 m (Courceyan-Chadian spores)

JUDIQUE FORMATION (ECHj): fluvial sandstone, minor shale, 100-500 m (Tournaisian spores)

CREIGHTON FORMATION (ECHc): fluvial-alluvial sandstone, conglomerate, 1500 m

GRANTMIRE FORMATION (ECHg): alluvial conglomerate and sandstone

FISSET BROOK FORMATION (DCfs): tholeiitic-alkalic basalt, rhyolite, fluvial-alluvial sandstone, conglomerate, 400 m (Famennian-Tournaisian); Rb-Sr whole rock isochron age of 376±12 Ma[1,2]; U-Pb concordant zircon age of 373±4 Ma[6]

McADAM LAKE FORMATION (MDm): alluvial-fluvial conglomerate, arkose, shale, felsic tuff (late Early Devonian - early Middle Devonian spores)

LCPbc LCc LCm LCMgv LCMb LCMso LCMw LCMs LCPph LCCph E-LCMm E-LCMp E-LCMg ECWu ECWm ECWl ECHss ECHj ECHc DCfs DCgb DCdg DCgp DCd Dd Db Ds MDm

(Cg): granite (Rb-Sr whole rock isochron ages of 341±6 Ma[2] for Gillanders Mountain; 330±23 Ma[4] for Wilkie Sugarloaf Pluton)

(Cgb): gabbro (U-Pb zircon and baddeleyite age of 339±2 Ma[2])

(DCg): granite (Rb-Sr whole rock isochron ages of 343±25 Ma[38,41] for Deep Cove Pluton; 357±11 Ma[38] for Petit de Grat Pluton)

(Dg): granite (Rb-Sr whole rock isochron age of 379±19 Ma[38] for Gillanders Mountain Pluton)

(Dgp): granodiorite (U-Pb concordant zircon age of 402±3 Ma[38] for Cameron Brook Pluton)

(Dgp): granite (Rb-Sr whole rock isochron age of 400±5 Ma[38] for West Branch North River Pluton)

(Dgp): orthogneiss (U-Pb nearly concordant zircon age of 403±3 Ma[38] for Neils Harbour orthogneiss)

(Dg): granite (U-Pb concordant monazite age of 414±3 Ma[38] for Cape North Pluton)

(SDg): granite (Rb-Sr whole rock isochron ages of 419±11 Ma[38] for Taylors Barren Pluton; 413±10 Ma[38] for Gooh Brook granite)

(SDgg): orthogneiss (U-Pb lower-intercept zircon age of 433+20/-10 Ma[38] for Belle Cote Road orthogneiss)

(Cg): granite (U-Pb concordant zircon age range of 374±3 to 350±6 Ma[1,38,41,42])

(Cgp): granite (U-Pb zircon age of 371±6 Ma[38] for Wilkie Sugarloaf Pluton)

(Cgt): granite (U-Pb concordant zircon age range of 493±2 Ma[38])

(Cgg): granite (U-Pb zircon age of 509±2 Ma[42])

(Cgp) granite, pegmatite | (Cgt) granite, tonalite | (Cgg) granite, granodiorite

CLYBURN BROOK FORMATION (ODcb): metamorphosed felsic and mafic volcanic and volcaniclastic rocks, slate, phyllite, psammite (Rb-Sr whole rock isochron age of 412±15 Ma[38]; cut by Cameron Brook Pluton with U-Pb concordant zircon age of 402±3 Ma[38])

SARACH BROOK METAMORPHIC SUITE (OSs):
felsic-intermediate flows and pyroclastic rocks, minor slate, conglomerate (U-Pb concordant zircon age from rhyolite of 433+7/-4 Ma[38])

JUMPING BROOK METAMORPHIC SUITE (OSJ): undivided
(U-Pb concordant zircon age from feeder dyke (?) to Sg of 430±7 Ma[38])
(OSJs): metamorphosed siltstone, wacke, conglomerate, arkose, minor rhyolite
(OSJv): metamorphosed basalt, lapilli tuff, chlorite schist, pelitic and psammitic schist

MONEY POINT GROUP (OSw): undivided
(OSWv): metavolcanic rocks: amphibolite, hornblende-biotite schist, metarhyolite (U-Pb concordant zircon age from rhyolite of 428±4 Ma[38])
(OSWs): metasedimentary rocks: semipelitic schist, pelitic schist, calcsilicate rocks and rare marble

Unconformable on McMillan Flowage Formation

CHETICAMP LAKE GNEISS (OSg): orthogneiss, minor semipelitic paragneiss and biotite schist (U-Pb concordant zircon age from orthogneiss of 396±2 Ma[38])

Unconformable on McMillan Flowage Formation

MABOU HIGHLANDS METAMORPHIC SUITE (ESMh): psammitic-pelitic gneiss and schist, marble, amphibolite

MIDDLE RIVER METAMORPHIC COMPLEX (ESMr): psammitic, semipelitic and pelitic gneiss, marble, amphibolite

CAPE NORTH GROUP (ESc): semipelitic, pelitic and calcsilicate gneiss, minor marble and amphibolite

(ED$_m$): amphibolitic metavolcanic and metasedimentary rocks

ESMh ESMr ESc EDm OSs OSJ OSJs OSW OSWv OSWs ODcb OSc

McLEOD BROOK FORMATION (€Om): marine shale, >400 m (Tremadocian-Arenigian graptolites, trilobites and brachiopods)

MacNEIL FORMATION (LCm): marine shale and limestone, >100-300 m (Late Cambrian trilobites and brachiopods)

Unconformable on MacNeil and MacLean Brook Formations

MacMULLIN FORMATION (MCmm): shallow marine siltstone and shale, >300 m (early Middle Cambrian trilobites)

BOURINOT GROUP (m-LCb): *GREGOWA, DUGALD and ESKASONI FORMATIONS*: tholeiitic basalt, rhyolite, tuff, siltstone, shale, 200-700 m (early Middle Cambrian fauna) (U-Pb concordant zircon age of 505±3 Ma[38])

Unconformable on George River Metamorphic Suite

MacLEAN BROOK FORMATION (MCm): shallow marine siltstone and shale, >300 m (late Middle Cambrian brachiopods and trilobites)

TROUT BROOK FORMATION (MCt): marine shale, 170 m (early Middle Cambrian trilobites and brachiopods)

LCm MCm MCt MLCb €Om €Cmc €Cmr

MacCODROM and CANOE BROOK FORMATIONS (€Cmc): shallow marine siltstone, shale, mudstone, >300 m (= Boisdale Group and Briges Formation, Newfoundland) (Early Cambrian (Tommotian-Botomian) trilobites and brachiopods)

MORRISON RIVER, SGADAN and BENGAL ROAD FORMATIONS (€Cmr): proteltic-microbial conglomerate, sandstone, shallow marine quartzite, >300 m (= Chapel Island and Random Formations of Manykaian age in Newfoundland)

KELVIN GLEN FORMATION (3k): subaerial-tidal arkose, conglomerate and siltstone, >300 m (= Rencontre Formation of latest Proterozoic age in Newfoundland)

MAIN-A-DIEU GROUP (3m): felsic-intermediate tuff, tholeiitic volcanic arc basalt, conglomerate, arkose, sandstone, siltstone (U-Pb discordant zircon age of ? ca. 563 Ma[6])

3k 3M 3p 3F

(3$_{gt}$): granitoid (Rb-Sr whole rock isochron age of 533±19 Ma[4] for Ohio Pluton)

3Cgt

PRICE POINT FORMATION (3p): intermediate tuffs and flows (intruded by Indian Brook granodiorite with a U-Pb concordant titanite age of 564±5 Ma[38])

FOURCHU GROUP (3F): felsic, intermediate and mafic tuff, tholeiitic volcanic arc basalt, rhyolite, sandstone, siltstone and chert (U-Pb concordant zircon age of 575+4/-1 Ma[6])

3gt

PRINGLE MOUNTAIN GROUP (3PM): felsic, intermediate and mafic tuffs or flows

EAST BAY HILLS GROUP (3E): felsic, intermediate and mafic tuff, calcsilicate volcanic arc basalt, andesite, rhyolite, conglomerate, sandstone, siltstone (U-Pb concordant zircon ages of 623±3, 5606±11, 5599±20 Ma[6])

COXHEATH HILLS GROUP (3C): felsic, intermediate and mafic tuff, calcsilicate volcanic arc basalt, andesite, rhyolite, sandstone, siltstone (U-Pb concordant zircon age of

SURFICIAL GEOLOGY
OF THE PROVINCE OF
NOVA SCOTIA
MAP 92-3

Compiled by R.R. Stea, H. Conley and Y. Brown

SCALE
1:500,000 or 7.89 miles to 1 inch

Miles 10 0 10 20 30 Miles
Kilometres 10 0 10 20 30 40 Kilometres

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES
MINES AND ENERGY BRANCHES

Honourable C. W. MacNeil, M.D. — Minister
John Mullally — Deputy Minister

HALIFAX, NOVA SCOTIA

1992

Planimatric base LRIS 37-01 is from the Department of Energy, Mines & Resources, Canada, Surveys & Mapping Branch. Revised in 1989 by Land Registration and Information Service. Scale 1:500 000, Transverse Mercator Projection, Central Meridian 63°.

Cartography by: D. M. Richard and T. R. Bradley, Land Registration and Information Service, Amherst, Nova Scotia.

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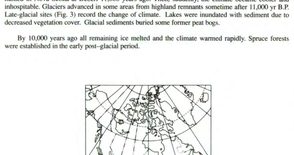
The Surficial Geology of the Province of Nova Scotia is available in digital form through Land Registration and Information Service, Amherst, N.S.

For notification of errors or omissions to the Surficial Geology contact the Nova Scotia Department of Natural Resources.

Index map to compilation sources



EXPLANATION

This map depicts the distribution and nature of Quaternary glacial and other surficial deposits in Nova Scotia. Outlined on the map is the glacial history of Nova Scotia. Surficial deposits form the parent materials for most soils in Nova Scotia. The data on this map are an aid to environmental studies, mineral exploration, agriculture, forestry and construction.

Figure 1 is a summary of the stratigraphic and temporal relationships of Nova Scotia Quaternary deposits. Quaternary lithostratigraphic units in Nova Scotia are arranged by region and time from the lowest or earliest units to the highest or latest units. The erosional stratigraphic record (striations) is also shown on this Figure (see also Fig. 2). Ice flow phases are correlated with till sheets by comparing regional ice flow directions with till provenance and fabric. Named Quaternary lithostratigraphic units are shown on this figure and described in more detail on back of the map. Reference sections used to construct this diagram are numbered on the bottom of the diagram. Refer to the map on the reverse side for section locations and descriptions.

Colours on Figure 1 refer to lithogenetic units described in the legend (i.e. green units are tills; orange – glaciofluvial, etc.). Screened regions on the diagram imply ice–free conditions prevailing, indicated by soil formation. Arrows indicate the uncertainty of age assignments in this compilation. Dated fossil materials (bone, shells, wood and peat) are depicted on the diagram in their stratigraphic and temporal context. Reworked fossil materials (i.e. shells in till) have arrows pointing to their presumed source beds. Roman numerals correspond to pollen stratigraphic units (see list of sites on back for further description).

Intensely oxidized deposits (Bridgewater, Mabou Conglomerates) may predate the earliest glaciation. A pre–Illinoian interglacial interval (200,000–300,000 yr B.P.) is indicated by dates on shells in till in southwest Nova Scotia. The last interglacial period, the Sangamonian (75,000–128,000 yr B.P.), is represented by marine and terrestrial deposits underlying tills of the last glacial period, the Wisconsinan. The Salmon River Sand in southwest Nova Scotia has a warm water fauna indicating present–day conditions. During this time sea level was up to 5 m higher than at present. This higher sea level cut a shoreline whose remnants are flat, wave–cut rock benches underneath glacial deposits. At the same time forests grew on land. These forest communities changed from hardwood–dominated (Unit I) during the warm part of the interglacial to spruce and fir forests (Unit III) in the colder phases.

It is not certain when glaciers first developed in the Wisconsinan. In northern Cape Breton Island, ice–free conditions may have persisted until 50,000 yr B.P.; offshore in the Gulf of St. Lawrence perhaps later. Continuous ice cover throughout most of the Wisconsinan stage is indicated on the mainland, except for indications (soils?, lacustrine deposition) of short–lived ice retreat at several sections.

The earliest Wisconsinan ice flows in Nova Scotia were eastward (Phase 1a, Fig. 2) then southeastward (Phase 1b, Fig. 2). Several widely–spaced striation sites reveal a distinct eastward flow, preserved in bedrock lee–side hollows and depressions, later overrun by southeastward–trending striations. In fact, the eastward ice flow may represent a separate, older phase of glaciation. The Hartlen, East Milford, Richmond and Red Head Tills (Fig. 1) were formed during these ice flows. The East Milford Till contains boulders of igneous rocks from the Cobequid Highlands and basaltic rocks from the North Mountain which were transported southeastward and can be traced to the Atlantic Coast, up to 120 km down–ice. This phase may represent glaciers with an Appalachian or Laurentide source.

The second major ice flow trend (Phase 2, Fig. 2) was southward and southwestward from the Escuminac Ice Center in the Prince Edward Island region. This event is recorded by southward–trending striae crossing earlier southeastward–trending striae at many localities on the upland regions of Nova Scotia and New Brunswick. The Lawrencetown and Eatonville Tills (Fig. 1) were formed during this flow event. Material from the vast area of redbeds in northern mainland Nova Scotia and Carboniferous basins in the Prince Edward Island region was transported southward onto the metamorphic and igneous terranes of mainland Nova Scotia. Southward dispersal of distinctive Cobequid Highland erratics occurred with the dispersal of the red material.

During the next ice flow event (Phase 3) granites from the Atlantic Uplands Physiographic Province were transported northward onto the North Mountain. The Hants and Beaver River Tills were formed during this ice flow phase. Erratics from the Cobequid Highlands can be found throughout the Cumberland – Pictou Lowlands to the north. Northward–trending striations can be traced across the northern mainland of Nova Scotia (Fig. 2). This well documented northward ice flow was clearly in response to the development of an ice divide in southern Nova Scotia (Fig. 2). Ice flow was northward and southward from this divide across the axis of the Nova Scotia peninsula. This divide may have formed as a result of marine incursion into the Bay of Fundy or a climatic event.

The final phase of ice flow resulted from remnant ice caps developed from the Scotian Ice Divide (Fig. 2). Eskers and striations cut across features formed by earlier ice flows. Ice caps or glaciers that formed over the Chignecto Peninsula and southern Nova Scotia had margins on land marked by moraines, ablation till, glaciofluvial deposits, and the pinch–out of stony till sheets. The Shulie Lake and Toney River Tills were formed during this last ice flow phase. Ice flow during this last phase was funnelled westward into the marine basins. Erosional features and deposits relating to these late–glacial ice caps are restricted to low–lying areas.

At the end of the Late Wisconsinan the sea encroached into the Bay of Fundy and ice retreat occurred rapidly through calving. Glaciomarine deltas formed along the coast, dated from 14,300 to 12,600 yr B.P. Peat formed in depressions on land starting 12,700 yr B.P. The climate warmed and spruce trees migrated into the region along with ice age mammals including caribou. Indians first hunted in Nova Scotia at Debert 11,000 years ago. Then, suddenly, the climate became cooler and inhospitable. Glaciers advanced in some areas from highland remnants sometime after 11,000 yr B.P. Late–glacial sites (Fig. 3) record the change of climate. Lakes were inundated with sediment due to decreased vegetation cover. Glacial sediments buried some former peat bogs.

By 10,000 years ago all remaining ice melted and the climate warmed rapidly. Spruce forests were established in the early post–glacial period.

Index Map

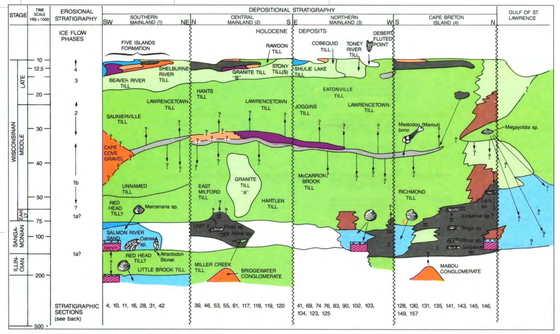


Figure 1. Space–time diagram illustrating the stratigraphic and temporal relationships between mapped surficial units and units found only in stratigraphic sections.

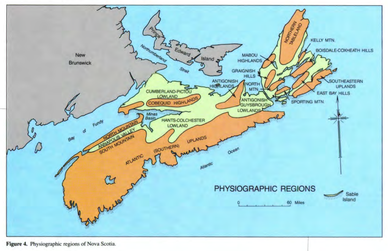


Figure 4. Physiographic regions of Nova Scotia.

This map shows the areas used for the stratigraphic compilation.

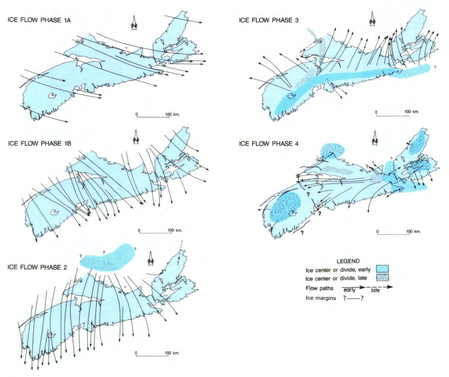


Figure 2. Ice flow patterns deduced from striation and drumlin directional data. Ice flow phase 1 depicts ice flows from an **Appalachian** or **Laurentide** source area eastward (1a) and southeastward (1b) across the Bay of Fundy and onto the continental shelf areas. Southward and southeastward flow patterns during ice flow phase 2 stem from the **Escuminac Ice Center** on the shelf north of mainland Nova Scotia. Ice flow phase 3 represents flows from the **Scotian Ice Divide** straddling the mainland of Nova Scotia. During ice flow phase 4 remnant ice caps flowed into marine basins adjacent to the Province.

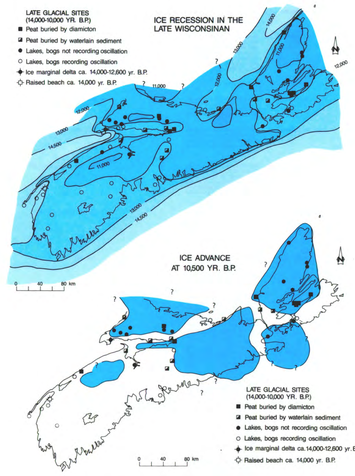


Figure 3. Ice recession in the Late Wisconsinan. The first map shows the successive positions of the Late Wisconsinan ice margin during the period from 14,500 yr B.P. to 11,000 yr B.P. Darker colours show progressively later areas of ice cover. The marginal positions are based on lake and bog sediments which record the retreat of glacial ice. Lake and bog sediments in these areas often show a transition from organic sediment to mineral sediment and back to organic sediment at the base are defined as lakes recording "oscillation" (see explanation). Such lakes are generally older than 12,000 yr B.P. and as old as 14,000 yr B.P. in southern Nova Scotia. The second map depicts an ice advance ca. 10,500 yr B.P. based on till and outwash covered late–glacial pear sites and lake sites not showing the climatic "oscillation".

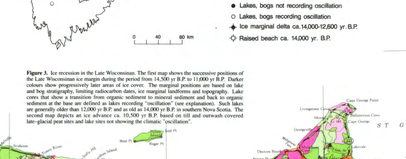


Figure 4. Diagrammatic representation of the stratigraphic relationships between surficial units on the Atlantic Uplands physiographic region.

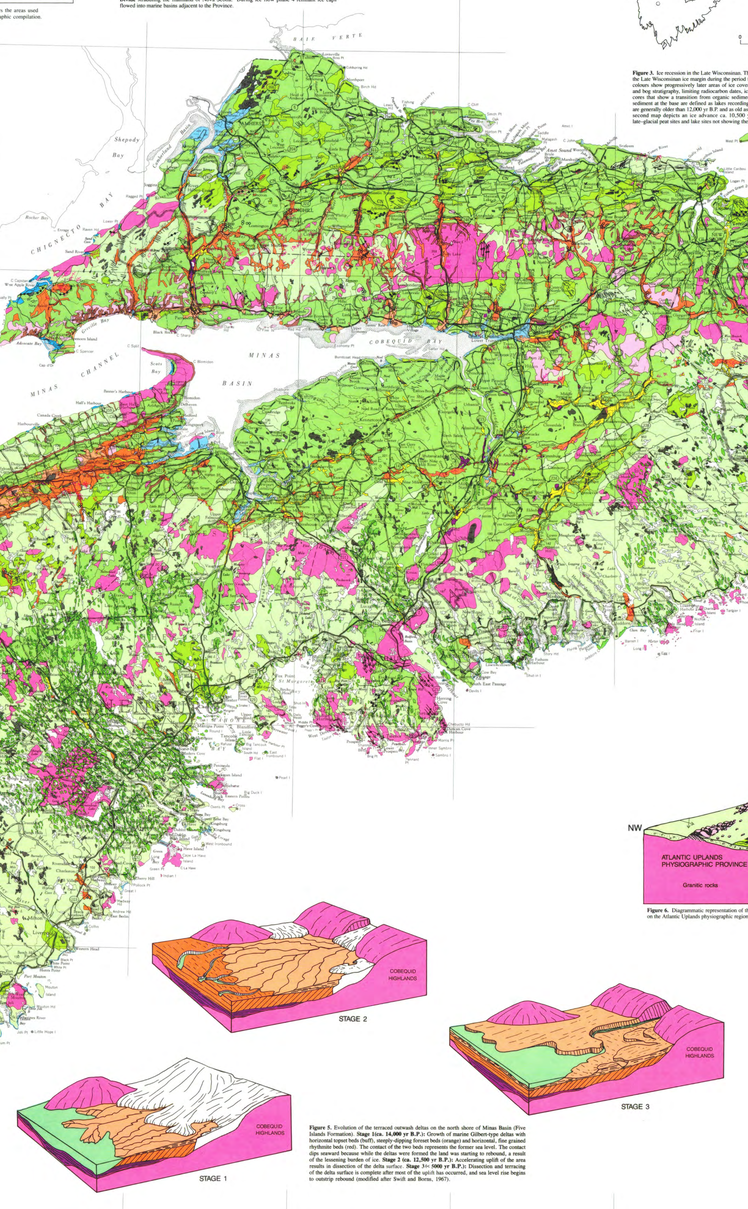


Figure 5. Evolution of the terraced outwash deltas on the north shore of Minas Basin (Five Islands Formation). **Stage 1(ca. 14,000 yr B.P.):** Growth of marine Gilbert–type deltas with horizontal topset beds (buff), steeply–dipping foreset beds (orange) and horizontal, fine grained rhythmite beds (red). The contact of the two beds represents the former sea level. The contact dips seaward because while the deltas were formed the land was starting to rebound, a result of the loosening burden of ice. **Stage 2 (ca. 12,500 yr B.P.):** Accelerating uplift of the area results in dissection of the delta surface. **Stage 3(< 5000 yr B.P.):** Dissection and terracing of the delta surface is complete after most of the uplift has occurred, and sea level rise begins to outstrip rebound (modified after Swift and Borns, 1967).

LEGEND

UNIT*	DESCRIPTION	TOPOGRAPHY	THICKNESS	ORIGIN	ECONOMIC AND ENVIRONMENTAL SIGNIFICANCE
POST LAST GLACIATION (HOLOCENE)					
ORGANIC DEPOSITS	Sphagnum moss, peat, gyttja, clay	Forms bogs, fens and swamps; swamps generally form along river valleys	Bogs: 1 m at the edge, 5 m in the centre; swamps, < 2 m	Develop by infilling of ponds or river courses by vegetation	Source of fuel, fertilizer, medicinal and industrial products; wet lands provide habitat for wildlife, peat extracts contaminants from groundwater
COLLUVIAL DEPOSITS	A complex mixture of glacial deposits; weathered rock from shattered rock and soils	Forms a blanket of material over steep valley walls; a talus cone or rotational slump	Increases from < 1 m at the top of the valley wall or slope to > 5 m at the base	Formed by periods of downslope creep and/or mass movements along valley sides	Source of aggregate of poor quality; valley sides can be subject to rapid, destructive mass movements; colluvium causes severe erosion; zone of springs and seeps
ALLUVIAL DEPOSITS	Gravel, sand, mud, bedded; may have a basal 'lag' of boulders; stream channels generally gravelly sand; floodplains sand	Flat or gently sloping river valley floodplains and sloping alluvial fans	Thin veneer, < 1 m, in small streams; > 20 m in large floodplains	Deposited by streams and rivers after retreat of the last glaciers	Major source of groundwater; source of aggregate, utilized for pasture land, limitations include poor drainage; limitations include flooding, high water table, poor drainage
MARINE DEPOSITS	Gravel, sand, silt, clay; locally riverlain by peat (salt marsh)	Beaches, soils and bars, intertidal mud marsh and mud flats; beaches along Atlantic coasts, Cape Breton Island, Sable Island, Northumberland Strait; salt marsh and mud flat mainly along Bay of Fundy shoreline	Beaches 2-8 m; salt marsh < 2 m	Formed by coastline sedimentation through wave action, longshore currents and tides	Wildlife sanctuaries, feeding grounds, recreational areas
LAST GLACIATION (WISCONSINAN)					
GLACIOLACUSTRINE DEPOSITS	Sand, silt, clay; laminated to massive; massive or crudely stratified diamictons (mixture of gravel, sand and mud)	Flat or gently rolling terraces perched above modern stream or river valleys	Generally > 2 m; can attain 30-40 m along major valley systems	Deposited in a ponded body of water either in direct contact with ice or fed by glacial meltwater	Clay utilized for brickmaking, pottery; land used for pasture; limitations include poor drainage and surface runoff
GLACIOMARINE DEPOSITS	Gravel and sand; bedded, dipping seaward 5 - 10°; locally silt and clay	Gently sloping shoreline above modern tide level, with protruding ridges (raised beaches) and scarps (wave-cut terraces)	Shoreline deposits vary from 4-5 m; gravelly raised beach ridges 3-10 m	Deposits formed as the sea flooded a lowered coastline, depressed by the glaciers' weight. As the land rebounded after the glacier left, the shoreline was raised above sea level	Gravel and sand utilized for aggregates; cultivated for agriculture; limitations land; groundwater source
GLACIOFLUVIAL DEPOSITS					
OUTWASH FANS, DELTAS AND VALLEY TRAIN DEPOSITS	Gravel and sand; massive to horizontally stratified; coarse to fine gradation within sections and deposits	Fan-shaped lobes at the mouths of valleys (OT); belts of outwash confined to valleys (VT); topset part of Gilbert-type deltas (O.D.), (see Fig. 5)	Outwash fans 5-30 m; valley trains 5-50 m; outwash deltas 5-25 m	Deposition by freely wandering glacial streams in front of a glacier (OT); meltwater streams confined to valley walls (VT); meltwater streams depositing material in to the ocean (O.D.)	Source of quality aggregate for construction industry, especially in areas of hard rocks; excellent aquifer, sometimes confined by clay at the base (O.D.); rapid drainage and recharge; sometimes good aquifer easily contaminated
KAME FIELDS AND ESKER SYSTEMS	Gravel, sand and silt, diamicton layers; poorly to well bedded; steep initial dips; kettle holes, faulting and collapse features common	Steep-sided mounds or hummocks (mouth karnes); pitted terraces on valley floors (kame terraces); sinuous, steep-sided ridges (eskers)	Generally 4-6 m; karnes 4-20 m; kame terraces 3-30 m; eskers 5-50 m	Streams of glacier meltwater depositing material in holes in the ice (K.F.) and beneath glacier and valley ice (E.S.) (see water drainage delta); in tunnels in the ice (E.)	Source of aggregate of varied quality; severe limitations to construction; groundwater source; rapid drainage and irregular topography; utilized for blueberries, pasturelond
GROUND MORAINE AND STREAMLINED DRIFT					
HUMMOCKY GROUND MORAINE (NOT DIFFERENTIATED IN CAPE BRETON ISLAND)	Till (mixture of gravel, sand and mud in all forms of relief); origin often complex and subject to debate; inclusions of waterlain sediment	Irregular rough topography; local ridges (dorsal moraines), depressions or pits (kettles)	Variable from 2-25 m	Material released from on top of, within and beneath ice masses by melting; usually at or near the margins of these ice masses	Source of aggregate of poor quality; severe limitations to construction industry; steep slopes, drainage, topography and acidity; poor buffering capacity for acid rain
STONY TILL PLAIN AND DRUMLINS	Till; stony, sandy matrix, material derived from local bedrock sources; drumlin facies: silter till due to erosion and incorporation of older till units by glaciers	Flat to rolling, with many surface boulders; drumlins-elongated oval hills veneered by stony till, with underlying multiple till layers (see Time-Space diagram)	Till plain 2-30 m; drumlins 4-30 m	Material released from the base of ice sheets by melting and rafting; these tills deposited by ice sheets centered over Nova Scotia (see Time-Space diagram)	Moderate limitations to crop agriculture, pasture, forestry; drainage, erodibility, factors affecting use for construction include shallowness, stoniness and high water table; poor buffering capacity for acid rain
SILTY TILL PLAIN AND DRUMLINS	Till; silty, compact, material derived from local bedrock and distant sources; drumlin facies: silter till, higher percentage of distant source material including red clay	Flat to rolling, few surface boulders; till is thick enough to mask bedrock undulations; drumlins often with multiple tills (see Time-Space diagram)	Till plain 3-30 m; drumlins 4-30 m	Material released from the base of ice sheets by melting and lodgment; these tills deposited by ice sheets centered outside of Nova Scotia (see Time-Space diagram)	Generally provide the best agricultural land in the province, moderate drainage and stoniness, moderate to good buffering capacity for acid rain because of interspersed calcareous bedrock components
PRE LAST GLACIATION					
ROCK					
RESIDUUM	Fragmented rock consisting of angular blocks and finer interstitial debris, overlain by thin, discontinuous veneer of till	Flat to strongly rolling	1-4 m	Mechanical and chemical weathering of bedrock occurring before and during glaciations	Used for road base aggregate; limitations include: flat to rolling, generally forested, acid rain buffering capacity depends on rock type but generally poor
BEDROCK	Bedrock of various types and ages; glacially scoured basins and knobs, overlain by thin, discontinuous veneer of till, shaped by glacial erosion	Flat to strongly rolling; ridges of hard rock exposed in thin till areas; rock with stoss and lee form roche moutonnée	Areas of glacier erosion and/or non-deposition	Forested regions; little use for agriculture; acid rain buffer-capacity depends on rock type, but generally poor	

* Glacial units are classified by origin and associated landforms according to a system developed by Goldthwait (1988).

SYMBOLS

- Geological boundary
- Cirques (large, semicircular rock basins)
- Roche moutonnée (truncated elliptical outcrop, steep lee side, barb points down-ice)
- Glacial striae (large and small linear grooves on rock; ice flow direction known, unknown, 1 indicates older striae, barb points in the direction of ice flow; printed on reverse side)
- Drumlins, fluted terrain (ridges and elliptical hills parallel to ice flow; symbols printed on reverse side)
- Moraine ridge (ridges perpendicular to ice flow; major, minor)
- Hummocks (mounds of till and sand and gravel)
- Esker (sinuous ridge of sand and gravel, generally parallel to ice flow; direction of meltwater flow assumed or known, unknown)
- Delta (kame, outwash)
- Kettle (circular depressions or pits; large, small)
- Meltwater spillway, channel (flat bottomed valleys with misfit streams)
- Terrace scarp
- Location of stratigraphic section of special interest (numbers refer to sections referenced in the time–space diagram (Figure 1) and in the sources of geological information on the back)

Nova Scotia Department of Natural Resources
Canada–Nova Scotia Mineral Development Agreement